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# The Pharmaceutical Journal

AND

# Transactions.

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## CONTRACTIONS OF TITLES.

*The following is a list of the contractions and the corresponding full titles of Journals most frequently used in "The Month." The titles prefixed by a * are those of official Journals.*

* *Amer. Journ. Pharm.* = American Journal of Pharmacy. Philadelphia. Monthly.

*Annalen* = Justus Liebig's Annalen der Chemie. Liepzig. Monthly.

* *Apot.-Zeit.* = Apotheker-Zeitung. Organ of the Deutsche Apotheker-Verein. Berlin. Twice a week.

* *Apot. Zeit. Rep.* = Repertorium der Pharmacie. Supplement to the Apotheker-Zeitung.

* *Archiv* = Archiv der Pharmacie. Berlin: J. Greiss. Monthly.

* *Berichte* = Berichte der deutschen chemischen Gesellschaft. Berlin. Once or twice a month.

* *Brit. Med. Journ.* = British Medical Journal, London. Weekly.

*Bull. com.* = Bulletin commercial. Supplement to L'union pharmaceutique. Paris: Pharmacie centrale de France. Monthly.

* *Can. Pharm. Journ.* = Canadian Pharmaceutical Journal. Toronto. Monthly.

*Chem. Zeit.* = Chemiker Zeitung. Cöthen. Twice a week.

*Chem. Zeit., Rep.* = Chemisches Repertorium. Supplement to the Chemiker Zeitung.

* *Compt. rend.* = Comptes rendus des séances de l'Académie des Sciences. Paris: Gauthier-Villars. Weekly.

* *Journ de pharm.* = Journal de pharmacie et de chemie. Paris: G. Masson. Twice a month.

*Med. Press* = Medical Press and Circular. London: A. A. Tindall. Weekly.

*Mon. scient.* = Moniteur scientifique. Paris. Monthly.

*Münch. med. Woch.* = Münchener medicinische Wochenschrift. Munich. Weekly.

*Nouv. rém.* = Les nouveaux rémèdes. Paris. Twice a month.

*Pharm. Centralh.* = Pharmaceutishe Centralhalle. Dresden. Weekly.

*Pharm. Post* = Pharmaceutische Post. Vienna. Weekly.

*Pharm. Zeit.* = Pharmaceutische Zeitung. Berlin: J. Springer. Twice a week.

*Répertoire* = Répertoire de pharmacie, archives de pharmacie, et journal de chimie médicale réunis. Paris. Monthly.

*Scient. Amer.* = Scientific American. New York. Weekly.

*Union pharm.* = L'union pharmaceutique. Paris: Pharmacie centrale de France. Monthly.

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# The Pharmaceutical Journal and Transactions.

VOLUME LIII. (Third Series, Volume XXIV.)—JULY 1, 1893.

## "THE MONTH."

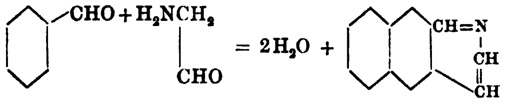
**Physiological action of Chemical Substances.**

In an address to the Chemical Society of Aix-la-Chapelle, Dr. A. Eichengrün has dealt with the subject of the medicinal action of compounds, and he expressed the opinion that, in the present state of science, there is no foundation for the hypothesis of a relation between chemical constitution and physiological action. It was pointed out that on the one hand, substances, such as antipyrin and antifebrin, which have chemically little relation, produce similar effects on the animal organism, while on the other hand bodies of closely related chemical constitution are sometimes very different in their physiological action. Moreover, alterations which scarcely affect the chemical character of certain substances, such as substitutions, preparations of homologs, etc., are accompanied by very considerable differences in physiological action, as, for instance, the neutralisation of the marked hypnotic action of sulphonal by the substitution of the methyl group for ethyl. It cannot be denied that in some instances there are grounds for inferring from the action of a body upon isolated constituents of the organism, such as albumin, the action that the body will exercise in the living organism. There are also some striking instances of relation between the chemical constitution of bodies and their action as shown by the similar action of all compounds of the same metals (K,Hg,Fe,Zn), and by the corresponding effects of various chemically related compounds, such as those of phosphorus, arsenic, and antimony; of iron and manganese; of zinc and cadmium. But in deducing from chemical behaviour conclusions as to physiological action, erroneous results may be arrived at if all the determining conditions are not considered. Not only are physical conditions of importance—solubility, etc.—but very minute differences of composition or constitution are sometimes accompanied by disproportionate differences in effect. Moreover, in the living organism most substances act in a manner different from that anticipated, partly because they happen to be brought into contact with other substances than those upon which they were intended to act, and are thus altered before exercising the action desired. Sometimes the action in the organism is quite different from that outside of it, so that substances capable of resisting chemical influences in a high degree, readily break up under the influence of vital processes, and, on the contrary, readily decomposable substances are not altered under those conditions. Dr. Eichengrün regards as equally fallacious the arguments from analogy, such as those relating to the increase of activity of alcohols being connected with increase of molecular weight, or the greater activity of para compounds as compared with ortho or meta compounds. Methyl alcohol has a stronger action than ethyl alcohol, salicylic acid has decidedly greater antiseptic action than the meta or para benzoic acids. This criticism appears, however, insufficient to shake the belief in a connection—at present mysterious—between chemical constitution and physiological action but, so far as it applies, it points merely to deficient knowledge.

**Characteristics of Crystallised Terpineol.**

It has already been shown by Wallach that terpin, $C_{10}H_{20}O_2$, is to be regarded as a glycol—a saturated dihydric alcohol, $C_{10}H_{18}(OH)_2$—that is readily convertible by elimination of water into the unsaturated monohydric alcohol terpineol, $C_{10}H_{17}{\cdot}OH$. By further elimination of water the hydrocarbon produced is either terpinene, terpinolene, or dipentene, according to the condition under which the change takes place. The "terpinol" obtained by Wiggers and List by the action of acids upon terpin hydrate has been found to consist of a varying mixture of terpineol with the several hydrocarbons above mentioned. In view of the possibility that in the dehydration of terpin isomeric terpineols may be formed, it seemed probable that the liquid terpineol first obtained was a mixture of such isomers, and in that case the formation of isomeric hydrocarbons from terpineol would be intelligible. Terpineol, however, has since been obtained by Bouchardat and Voiry in a crystalline state, and undoubtedly as an individual substance. Wallach has, therefore, experimented upon material of this kind obtained from Messrs. Schimmel. The melting point was 30°-31°, and after purification 35°. It united with carbanil, forming crystalline terpenyl-phenylurethane $CO{<}^{NHC_6H_5}_{OC_{10}H_{17}}$—, the melting point and other characters corresponding with those previously described by Wallach. The crystalline terpineol, when heated for an hour with perfectly dry potassium bisulphide, distilled and dried with caustic potash, gave a product boiling principally at 178°-180°, consisting of a hydrocarbon, $C_{10}H_{16}$, which gave dipentene tetrabromide melting at 125°. By treatment with dilute sulphuric acid the terpineol was converted into a mixture of cineol, dipentene, and terpinolene. With stronger acid the terpineol was partly oxidised. Phosphoric acid had a similar effect. Treatment with oxalic acid gave rise to the formation of some terpinene and cineol, but the chief product was terpinolene. Crystalline terpineol is the best material from which to obtain dipentene or terpinolene. To prepare the former, potassium bisulphate is to be used for eliminating water, and oxalic acid for preparing the latter. The possibility of conveniently preparing tetrabromides of these two hydrocarbons led to the following experiments. It has been shown that limonene tetrabromide treated with alcoholic potash yields a monobromide, $C_{10}H_{15}Br$, and it was probable that dipentene tetrabromide would behave in a similar manner, but it was found to yield only a small quantity of a hydrocarbon and a larger proportion of a heavy bromide, volatilisable with difficulty by steam. Terpinolene tetrabromide behaves quite differently, and the principal product is a hydrocarbon apparently containing cymene (*Annalen*, 275, 103).

**Isoquinoline.** Since a number of important bases are probably derivatives of isoquinoline, it is possible that various useful products might be obtained from it synthetically. A new method of preparing isoquinoline, discovered by Pomeranz, is therefore interesting. It consists in the condensation of benz-aldehyde and amido acetaldehyde—



Benzaldehyde. Amido acetaldehyde. Isoquinoline.

On mixing amido-acetal and benzaldehyde they unite, forming benzylidine-acetal, $C_{13}H_{10}NO_2$, and on heating this product with sulphuric acid isoquinoline is formed (*Wiener Monatsh.*, xiv., 116).

**Formanilid $C_6H_5NH.COH$.** This substance has the form of long flattened four-sided prisms: it melts at 46° C., is readily soluble in alcohol, somewhat less in water. A three per cent. solution injected subcutaneously or into the urethra produces anæsthesia. A twenty per cent. solution produces upon the tongue a strong biting sensation at first and then a long continued numbness. When dusted upon bleeding wounds formanilid is said to be a much more powerful hæmostatic than antipyrin (*Pharm. Post.*)

**Piperazine $C_4H_{10}N_2$.** This substance is formed to some extent, with elimination of water, by the reaction of glycol $C_2H_4(OH)_2$ with ethylenediamine

$$C_2H_4(OH)_2 + C_2H_4(NH_2)_2 = (C_2H_4NH)_2 + 2H_2O,$$

but even at a high temperature and under the influence of dehydrating agents the yield is very small. On the contrary, the reaction is complete when sodium glycol is treated with the acid derivatives of ethylenediamine

$$\left.\begin{matrix} C_2H_4(ONa)_2 \\ C_2H_4(NH.COR')_2 \end{matrix}\right\} = \left\{\begin{matrix} (C_2H_4NH)_2 \\ 2R'COONa \end{matrix}\right.$$

This process is the subject of the German patent (67811) under which piperazine is made by the Schering Company.

**Red Phosphorus.** According to observations made by J. W. Retgers, phosphorus in this condition is not amorphous but crystalline. This has been ascertained by the use of the polarisation microscope. On account of the very high refractive power of the particles the optical examination must be made in a medium that is also of high refractive power, and eventually methylene iodide was selected for the purpose. The crystalline system has not been determined, but it is probably the hexagonal. The fact that ordinary yellow phosphorus is converted into the red modification under the influence of sunlight is in accord with the crystalline character of red phosphorus, since there is no known instance of a conversion from the crystalline into the amorphous state in that way (*Zeitschr. Anorgan. Chemie*, iii., 339).

**Detection of Strychnine.** Beckurts has made experiments to determine the extent to which the presence of brucine interferes with the detection of strychnine by the reaction with potassium dichromate and sulphuric acid. With a mixture of strychnine and twenty parts of brucine a distinct reaction is obtained, and when the proportion of brucine is twice as great an indistinct reaction is observable. But in this case the actual quantity of strychnine must be at least one milligramme, while $\frac{1}{100}$th of a milligramme gives the reaction in the absence of brucine, according to the observations of both Dragendorff and de Vrij. (*Archiv. Pharm.*)

**Decomposition of Iodoform.** The decomposition of iodoform under the influence of sunlight takes place much more readily when it is dissolved in chloroform than when dissolved in other solvents. This is attributed by Kinzel to an acceleration of the change produced in chloroform by contact with oxygen under the same condition, the effect produced by the greater susceptibility of iodoform to the action of oxygen being the reverse of that produced by alcohol in retarding the decomposition of chloroform. He assumes therefore that the mere presence of iodoform facilitates the action of oxygen upon the chloroform in which it is dissolved, and that the chloroform acts the part of a carrier of oxygen to the iodoform, the reactions taking place being as follow:—

$$CHCl_3 + O = COCl_2 + HCl$$

and

$$2CHI_3 + 3COCl_2 = 2CHCl_3 + 6I + 3CO$$

(*Pharmaceutische Zeitung*, 38, 387).

**Determination of Starch.** In order to avoid the action of mineral acids upon cellulose when converting starch into sugar, Guichard heats 5 grammes of the bran or meal with 90 c.c. saturated solution of oxalic acid for a quarter of an hour, in a flask fitted with a reflux condenser. After cooling he adds 10 c.c. dilute nitric acid—36° acid diluted to ten times its volume—filters a portion of the liquid, and boils it for one hour to convert into sugar. After boiling with oxalic acid the liquid contains soluble starch, dextrin, and a little glucose. The washed undissolved residue is free from starch, and can be used for determination of other constituents. From the amount of sugar found, that of starch can be calculated without the need of correction for cellulose altered. On boiling crude cellulose with dilute nitric acid it is converted into a paste, and the liquid becomes yellow in proportion to the quantity of nitrogenous substances present. The liquid reduces Fehling's solution and polarises. On repeating the boiling with more acid the formation of sugar ceases after about an hour. This process may be applied in determining the amount of saccharifiable material—lignin, incrusting substance, etc. Cellulose so treated is recognisable under the microscope by its characteristic form, but it is converted into hydro-cellulose (*Bull. Soc. Chim.*, through *Berichte*).

**Determination of Water in Butter.** This might be approximately effected by dissolving the butter in ether, shak- the solution with a measured quantity of water and observing the increase in the volume of water, if it were not for the magma collecting between the ether and water, which interferes with the reading. Wibel recommends dissolving the butter in ether saturated with water and pouring the solution into a narrow graduated tube containing a measured quantity of salt solution mixed with some acetic acid and litmus tincture. After mixing the two liquids by inclining the tube up and down and allowing the curd to settle, the increase of volume of the red solution can be read off. This test can be made within the space of a few minutes (*Zeitsch. f. Angew. Chemie*).

**Molybdic Acid and Gaseous Haloid Acids.** Smith and Oberholtzer find that gaseous hydrochloric acid converts molybdic acid into a solid, very volatile, product, $MoO_3 \cdot 2HCl$. Hydrobromic acid in the same condition changes it into a volatile brownish-yellow liquid, $MoO_3 \cdot 3HBr$, forming long yellow needles at low temperatures and under diminished pressure, and a crystallised solid of the formula $MoO_2Br_2 \cdot MoOBr_2$. Gaseous hydriodic acid reduces molybdic acid to a new oxide, $Mo_4O_{10} \cdot 3H_2O$, whilst hydrofluoric acid converts it into a volatile product having approximately the following formula :—$MoO_2F_2 \cdot MoOF_2$ or $Mo_2O_3F_4$ (*Journ. Am. Chem. Soc.*, xv., 18).

**Preparation of Oxygen in the Cold.** A. Tonneau describes a simple process for obtaining oxygen gas readily, without the risks attending the usual methods. To the middle opening of a three-necked Woulffe's bottle, holding two to three litres, is fitted an ordinary separating funnel with stopper and stopcock. This contains concentrated acetic acid, whilst in the bottle is placed a mixture of manganese dioxide and barium peroxide (about 100 to 200 grammes) covered with water, upon the surface of which a layer of oil is floated to prevent frothing when the gas is given off. On allowing a few cubic centimetres of the acid to drop into the bottle, oxygen is at once given off in the cold, and, after passing through a wash-bottle, is ready for use. When the gas is required for medicinal purposes it may either be inhaled direct, as it leaves the wash-bottle, or be collected in a rubber gas-holder. If used in the former way the action of the gas may be moderated by forcing air into the apparatus by means of a caoutchouc ball fitted with a valve, as employed in spray diffusers, etc., attached to one of the necks of the Woulffe's bottle (*Bull. com.*, xxi., 233).

**Isomer of Santonin.** Andreocci states that if a solution of santonin in concentrated hydrochloric acid be kept for several days in a stoppered vessel, at the ordinary temperature, there is deposited a crystalline substance isomeric with santonin. After purification the substance forms white crystals melting at 260°, insoluble in water, soluble in alcohol and acetic acid, slightly soluble in ether and benzole, insoluble in hydrochloric acid even at its boiling point, and in aqueous solution of sodium carbonate. It dissolves in solution of potassium hydroxide, and is reprecipitated by hydrochloric acid, but not by carbon dioxide (*Atti della Reale Accad. dei Lincei*, [5], ii., fasc. 7).

**Electrolytic Separation of Metals.** Smith and Moyer confirm the fact previously stated that mercury and bismuth cannot be separated electrolytically when present in a nitric acid solution. In the case of copper and antimony they have attempted to find a better and more certain method than any that have been previously published. By combining solutions of the two metals in the presence of tartaric acid and ammonia, results were obtained on electrolysis which showed that the separation was very satisfactory. The copper deposited showed no trace of antimony, and practically theoretical amounts were found throughout a series of experiments in which the relative quantities of the two metals were purposely varied to render it certain that the method could be relied upon (*Journ. Am. Chem. Soc.*, xv., 28).

**Cobalt Salts in Photography.** A. and L. Lumière, continuing their work on the photographic properties of different metallic salts (see *Pharm. Journ.*, [3], xxiii., 806), point out that when hydrated peroxide of cobalt is dissolved in oxalic acid solution, the oxalate of cobalt so formed is very unstable, being rapidly reduced under the influence of light if brought in contact with organic matter. Paper sized with gelatin and impregnated with the cobalt solution takes the green tint of the sensitive liquid, but this soon changes to rose colour by the action of light rays, a lower compound being formed. Efforts have been made to utilise this property for the production of photographic images, and the process recommended is as follows :—Freshly precipitated hydrate of cobalt is washed with warm water and dissolved in cold saturated solution of oxalic acid. Paper prepared with gelatin is impregnated with the solution formed, dried in the dark, and may afterwards be exposed under negatives like ordinary sensitised paper. Reduction of the cobalt salt is very rapid, much more so than is the case with silver salts. When the image is sufficiently dense the paper is immersed in a five per cent. solution of potassium ferricyanide. This compound reacts with the reduced salt of cobalt to form a reddish insoluble ferricyanide, and, on washing away the unaltered cobalt hydrate and excess of potassium ferricyanide, a pale red image is left. This may be intensified and altered in colour by treatment with an alkaline sulphide, when the black sulphide of cobalt will be formed. Treatment with ferrous salts gives blue prints, whilst nickel salts form red images. The whole process is very simple and inexpensive, and yields prints of great permanence in a brief space of time (*Comp. rend.*, cxvi., 1361).

**Geraniol from Linalool.** G. Bouchardat states that acetic anhydride reacts with linalool at the ordinary temperature and appears to cause the formation of the corresponding ether, from which the original linalool may be regenerated, but the reaction is slow and incomplete. As soon, however, as the temperature is raised and maintained for some time at 100° to 120°, combination takes place and the rotatory power disappears, but at the same time an acetic ether is formed which is a derivative of another alcohol. This ether has a density of 0·9377 to 0·9467 at 0°, and possesses a very agreeable odour, recalling that found in the oil of *Lavandula vera*. Saponified with alcoholic potash at 100°, a neutral compound, $C_{10}H_{18}O_2$, is formed, which boils at 226° to 231° with slight decomposition, is totally inactive when polarised, and has a density at 0° of 0·9061. It combines with four equivalents of bromine, which it decolorises instantly like linalool, a body being formed which is crystalline or oily according to the temperature employed. The alcohol has an agreeable rose odour, and has been proved to be identical with geraniol extracted from Indian oil of geranium (*Comp. rend.*, cxvi., 1253).

**New Series of Colouring Matters.** A. Trillat has investigated the action of formic aldehyde upon the derivatives of triphenylmethane and other colouring matters, and describes a new series of colours that he has thus obtained. Rosaniline yields a fine violet product that is, however, very unstable in the presence of light, whilst safranine forms crystalline salts which possess a brilliant metallic appearance and readily dye silk, wool, and cotton, without the aid of mordants. He concludes by stating that formaldehyde reacts freely with simple and compound amines of the aromatic series, in which at least one atom of hydrogen is replaceable, and that the shades of the amido colouring matters are profoundly modified by the substitution, being changed generally in a direction corresponding to the right with regard to the colours of the spectrum (*Comp. rend.*, cxvi., 1382).

**Phenocoll as an Antiseptic.** Dr. C. Beck has compared the antiseptic value of acetanilide, phenacetin, and phenocoll, by employing them on wounds, etc., in the forms of powder, solution, ointment, and gauze. Acetanilide did not seem to cause irritation, and is ranked with boric acid. Phenacetin is more powerful and was found to produce no ill effects. It ranks between boric acid and iodol in value. Phenocoll, however, far surpasses both, its hydrochloride being stated to be probably as valuable an antiseptic as iodoform and stronger than most others. It is preferable to iodoform because of its lack of odour, ready solubility, and non-irritant effect. Further, it is not contra-indicated in kidney disease and, being non-poisonous, can be applied to very extended surfaces (*New York Med. Journ.*, April 22).

**Coloration of Morphine Hydrochloride Solution.** P. Welmans has drawn attention to the coloration produced when a strong solution of morphine hydrochloride is prepared with the aid of heat. He attributes the coloration to the formation of some oxydimorphine resulting from the action of atmospheric oxygen condensed in the porous mass of the salt and suddenly disengaged during solution. He therefore recommends that solutions of morphine hydrochloride should be prepared without heat, and that they should not be made too strong (*Pharmaceutische Zeitung*, 38, 375).

**Action of Moulds on Morphine.** A. Lamal finds that under certain conditions morphine may undergo oxidation by the agency of moulds and bacteria. This result was obtained in the case of moulds by cultivating them for a period of three months upon morphine sulphate with which certain mineral salts essential to the nutrition of the plants were mixed. Bacteria effected a similar change only in the presence of oxygen (*Bull. de l'Acad. de méd. de Belg.*, 1893).

**Qualitative test for the presence of Bacteria.** At a meeting of the German Society for the Protection of Public Health, Dr. Gottstein suggested that the decomposition of hydrogen peroxide and consequent evolution of oxygen gas under the influence of bacteria, may be made a means of testing water as to its condition, since the effect produced is proportionate to the number of bacteria present. With 10,000 in the cubic centimetre the disengagement of gas is very brisk, and it is distinctly recognisable when there are only 1000 in the cubic centimetre. In some instances the action does not take place until fifteen minutes after the hydrogen peroxide has been added. The test tubes used for the purpose should be heated to redness immediately before the test is made.

**Bacteria and Infusoria.** Dr. D. Harvey Attfield describes a number of experiments carried out by him in the laboratories of the Hygienic Institute at Munich, to ascertain whether infusoria have anything to do with the so-called self-purification of foul water. Water from a disused well, containing as many as 10,000 bacteria per c.c., but almost free from infusoria, had a small proportion of water from the Isar river, swarming with the latter organisms, added to it. The figures given show that the bacteria decreased to less than one-fifth of their original number in six days, whereas the well water alone, containing no infusoria, showed a decrease of only fifty per cent. in the same length of time. In the absence of light the results were very similar, as was also the case when filtered air was driven through the fluids. In one case water containing 3,000,000 bacteria per c.c., together with infusoria, contained only a little over 13,000 ten days afterwards. A sample of well water without infusoria rose in bacterial contents from 700 to 121,500 in the same length of time. It would seem therefore that in these experiments some powerful influence was exerted in the presence of infusoria, in the direction of ridding the water of bacteria (*Brit. Med. Journ.*, 1694, 1262).

**Glycerin and Vaccine Lymph.** Some time ago reference was made to Dr. Copeman's method of adding glycerin to lymph, and, in a recent paper, he gives fuller details, recording the results of a number of experiments. The lymph, as previously mentioned (see *Pharm. Journ.*, [3], xxiii., 608), is diluted with a mixture of glycerin and sterilised distilled water prior to storage in capillary tubes that have been sterilised by heat. The mixture thus prepared does not dry up so rapidly as ordinary lymph, thus affording greater facilities towards attaining uniformly successful vaccinations, and a much larger supply of it is made available. It retains its properties unimpaired, and is not only as effective as usual, but in process of time increases in potency. The glycerin appears to inhibit the growth of and kill off all extraneous bacteria that may develop or are originally present (see *Pharm. Journ.*, [3], xxiii., 808). The later experiments appear to show that many pathogenic and all saprophytic organisms are destroyed in the presence of glycerin in from three or four days to as many weeks. The diplococcus of Fränkel preserved its virulence in glycerin for not less than sixty-seven days; the bacillus of fowl cholera was virulent after seventy-four days, but was killed by contact with the glycerin for four months; whilst the virulence of anthrax gradually decreased, ceasing on the seventh day in one experiment and on the ninth in another. The results of several other recent investigators are quoted as confirming the superiority claimed for this new method of lymph storage (*Brit. Med. Journ.*, 1694, 1256).

**Disinfectants at High Temperatures.** Heider has tested the bactericidal properties of disinfectants at high temperatures and finds that the action of the majority of such preparations is greatly increased when they are so employed. Hot or even boiling solutions are best to effect the destruction of spores, and besides the great saving of time effected there is a considerable economy in the cost of material, less concentrated solutions being required. Anthrax spores were destroyed in less than two hours in a five per cent. solution of carbolic acid at 55°, and at 75° even a one per cent. solution had the same result within two and a half hours. Other disinfecting materials furnished equally satisfactory results under similar conditions (*Archiv. für Hygiene*, xv., 341).

**Application to Prevent the Stinging of Insects.** Pednof recommends for this purpose a concentrated solution of naphthalin in paraffin oil. A few drops are to be rubbed upon the exposed parts of the body. The application produces a temporary slight burning sensation which soon passes off. The offensive smell of naphthalin would, however, be a probable objection in some instances (*Revue de therap.*).

**Solution of Creasote.** M. Vizern, in criticising the formula proposed by P. Carles for preparing a solution of creasote in water (see *Pharm. Journ.*, [3], xxiii., 990), objects to the use of the tincture of quillaia in so large proportion. He refers to instances where saponin was stated to produce poisonous effects, and asks if it would be prudent to administer large doses of a mixture containing it per rectum. It is pointed out that creasote is frequently prescribed in injections to the extent of six grammes daily, and that, using the formula mentioned, this would necessitate the administration of the active principles of ten grammes of quillaia in the same period of time. In addition to this, there would also be injected daily forty-eight grammes of eighty per cent. alcohol. The conclusion arrived at, therefore, is that the suggested medium is one of doubtful value in this connection. As an alternative the use of the almond oil soap of the French codex is recommended, since this is said to dissolve its own weight of creasote in the desired quantity of water (*Journ. de Pharm.*, [5], xxvii., 593).

**Alcohol from Cellulose.** The convertibility of cellulose into sugar admits of its being made a source of alcohol, and attempts have been made to produce alcohol from wood in this way. The compact texture of wood has, however, proved an obstacle by which the cost of production was rendered too great for the practical adoption of the method. Quite recently it is reported that a more successful result has been obtained by operating upon cellulose of a naturally more open texture as it occurs in peat moss. For this purpose the turf is heated to 115°–120°C. with dilute sulphuric acid for four or five hours to convert the cellulose into sugar, and when the full effect has been produced the expressed liquor is fermented with yeast and afterwards submitted to distillation. It is stated that in this way turf is likely to compete favourably with potatoes as a source of alcohol, one thousand kilos. of dry turf yielding from 62 to 63 litres of absolute alcohol, while 500 kilos. of potatoes containing 20 per cent. starch yield at the utmost only 60 to 61 litres of absolute alcohol.

**Alcoholic Fermentation of Artichokes.** L. Lévy has been able to produce alcohol by fermenting artichoke tubers by means of pure yeasts. In a previous note (see *Pharm. Journ.*, [3], xxiii., 988) it was shown that inulin can be converted into a fermentable sugar by the action of a ferment, trehalase, found associated with it in these tubers. The washed and sliced tubers are treated with four times their weight of water at 60°, and containing two parts per thousand of potassium bitartrate. This process is repeated in four or five hours' time, after decantation of the first portion of liquid. On mixing the resulting solutions, the product should have a density of 1·03 or 1·04. This wort is sterilised by heating to the boiling point three times on successive days, and the yeast then added, after which fermentation proceeds rapidly. The passage of a current of sterilised air hastens the process, so that at a temperature of 20° to 25° the fermentation is completed in three days. The alcohol is then separated by distillation in the usual manner (*Comp. rend.*, cxvi., 1381).

**Oil of Jatropha Curcas.** Arnaudon and Ubaldini extract this oil by means of ether. It is of a syrupy consistence, has a neutral reaction, is almost colourless, and of a density 1·915. It turns yellow on exposure to air, and deposits some globules of a fatty substance. The oil has a nauseous, slightly acrid odour, which persists for some hours, even in a stove heated to 100°; it is soluble in cold alcohol, though not quite so freely as castor oil. Warmed with potash in a retort it agrees with castor oil in yielding caprylic alcohol by distillation. The two oils appear to differ chiefly in the relative proportions of their constituents (*Mon. Scien.*, [4], vii., 447).

**Spermolepis gummifera.** Heckel and Schlagdenhauffen describe this plant as forming solid deposits of a tanno-resinous substance between the concentric zones of wood. This exudes from the surface of the trunk and branches of old trees, runs down cracks in the bark, and then spreads itself in thin shining black layers. It may also accumulate in small round drops, which dry quickly and present a brownish fracture. In parts these drops are transparent and of the colour of caramel. They are inodorous when fresh, have a very astringent taste, and crush between the teeth to a greyish dust, which sticks to the enamel. The astringent effect lasts for some time. When old the exudation exhales a disagreeable odour resembling that from a tannery. On analysis the substance was found to consist of gallotannic acid, 79 per cent.; woody matter, 5·9; albuminoid matter, 2·0; salts, 0·1; water, 13·0. In New Caledonia the tanno-resinous substance has been employed for tanning the skins of small mammals, but it does not appear as yet to have been utilised in the tanning industries generally. It suggests itself as affording a useful source of tannin (*Rép. de Pharm.*, [3], v., 241).

**Epiphegus Virginiana.** This is an indigenous American plant, parasitic on the roots of the beech tree. It is regarded as possessing astringent and depurative properties. A. C. Koeppen has submitted a sample of the drug to chemical examination and obtained indications of the presence of a glucoside, an alkaloid, and a crystalline organic acid, together with tannin, resin, mucilage, sugars, and fat (*Am. Journ. Pharm.*, lxv., 274).

**Phytolacca decandra.** H. Trimble has obtained a proximate principle from this root by precipitating a concentrated alcoholic percolate with water. He purifies the precipitate by solution in alcohol and reprecipitation by chloroform; dissolving again in potassium hydrate solution and precipitating with sulphuric acid; and finally dissolving once more in alcohol and precipitating by addition of ether. The dried product is described as a greyish amorphous powder in a somewhat scaly condition. It frothed when shaken with water, had a slightly bitter and acrid taste, was slightly soluble in cold and boiling water, soluble in alcohol, insoluble in ether and chloroform. Acetic acid dissolved it on warming, and formed a jolly on cooling. Alkalies formed with it soluble amorphous compounds that scaled on drying. The substance decomposed at about 208°, without fusing; on combustion figures were obtained corresponding to the formula $C_{54}H_{82}O_{23}$; and it is suggested that the substance is probably a saponin (*Am. Journ. Pharm.*, lxv., 273).

**Animal Charcoal as a Pill Excipient.** E. Violé suggests that when creasote, croton oil, terpinol (see p. 1), essential oil, or other medicament difficult to combine, is to form an ingredient of pill masses, they may be prepared quickly and satisfactorily by employing animal charcoal as an absorbent. Thus, to dispense one gramme of creasote in twenty pills, it should be added to two grammes of charcoal in a mortar and quickly mixed so as to form a soft paste. More charcoal is then added, about half a gramme at a time, until a moist powder, not adhering to the pestle or mortar, results. Then, on adding a fifth to a fourth of a gramme of turpentine and kneading quickly, a perfectly homogeneous and plastic mass is obtained. Croton oil is said to make a good mass with the charcoal alone. More complicated formulæ may be similarly dealt with. For instance, if creasote is to be dispensed with tannin and iodoform, it should be blended with charcoal as when prescribed alone, the other ingredients next added and the whole intimately mixed, turpentine being then used to bind all together. Pills so prepared are said to be very small, whilst they have the disagreeable odour of the creasote masked to a great extent, and it is claimed that they may be rolled in magnesia, silvered, or coated with tolu. In dispensing similar medicaments in cachets, washed animal charcoal is also stated to be of value, five grammes serving to divide two grammes of creasote, whilst ten grammes serve for five of turpentine. It is urged that by the aid of this substance, the pharmacist can prepare and vouch for the exact dose and quality of the remedies in all the capsules, coated pills, etc., that he may require to dispense, and so avoid the necessity of purchasing them from wholesale manufacturers (*Bull. de Pharm. de Bordeaux*, May, 142).

## THE BOTANY AND CHEMISTRY OF ESSENTIAL OILS.*

BY H. A. D. JOWETT.

### BOTANY.

The essential oils or products from which they are derived appear to be confined to certain orders, *Rutaceæ*, *Myrtaceæ*, *Umbelliferæ*, *Compositæ*, *Labiatæ*, *Lauraceæ*, *Coniferæ*, and others, but though confined to a relatively few natural orders they are found in all parts of the plant, and may occur in seeds, roots, stem, leaves, or flowers.

The oil is generally contained in special receptacles in the plant, which may be divided into vessels and cavities, and, indeed, they are often classified under these heads, but I prefer to treat of them as ($\alpha$) of protogenetic origin, arising by the differentiation of fundamental tissue, and ($\beta$) of hysterogenetic origin, appearing in differentiated tissue.

Those of protogenetic origin, which are by far the most common, may furthermore be divided into vessels and cavities.

1. *Vessels.*—These are generally of schizogenous origin, and occur in *Coniferæ*, *Compositæ*, and *Umbelliferæ*. They are formed in a simple way, well exemplified in Pinus. An intercellular space already existing or produced by division of a mother cell into four daughter cells becomes very much enlarged, and the cells surrounding it become modified, for by radial and tangential division they form an epithelium surrounding the vessel, and these in turn are surrounded by a tapetal or protective layer, and this often by a ring of sclerenchyma.

The epithelium secretes the oil as drops in the vessel, and the two protective layers prevent transfusion of the oil to the surrounding tissue.

The drops of oil thus formed coalesce until gradually we have the vessels filled with the essential oil. These passages generally occur in the cortical parenchyma of the plant, which is the great metabolic tissue, but they may occur either in the pith or primary xylem, as in Philodendron, whilst in the *Umbelliferæ* the passages are produced from intercellular spaces produced by the splitting of the walls of certain cells abutting on the pericycle.

2. Cavities are generally formed lysigenously, and occur in *Rutaceæ*, *Labiatæ*, *Myrtaceæ*, and are generally produced in the following way:—Two cells becoming meristematic give rise, by cell division, to a number of smaller cells, which secrete drops of oil, and by the coalescence of these drops the space formerly occupied by the cell is filled with the oil, the cell wall in the meantime having been dissolved, perhaps by an enzyme.

In *Myrta communis*, according to Frank (*Beitr.*, 125) a cell divides into eight octants, and these form an intercellular space, which, gradually becoming filled with oil, crushes the cells to the side, and they thus become flattened, form an epithelium. This is a case of schizogenous formation, but the details are doubtful, and fresh observations must be made before fully accepting this as a mode of formation of the oil cavity.

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* Read at a meeting of the Chemists' Assistants' Association, held on Thursday, March 2.

The spots in Hyperica and cells in Eucalyptus are formed thus, and it may be taken as a general rule that vessels are formed schizogenously and cavities lysigenously. We now examine the other divisions of oil receptacles, those of hysterogenetic origin.

3. They exist both as vessels and cavities, but are not nearly so common as those I have just described. In Copaifera and Dryobalanops the oil receptacles are of enormous size, and are formed by disorganisation and solution of the heart wood, and they are also formed in the secondary bast of certain *Umbelliferæ* and *Compositæ*.

In the *Coniferæ*, when the cortical parenchyma disappears owing to secondary thickening, the resin vessels are replaced by sacs of lysigenous origin.

The information at our disposal regarding the mode of formation of the oils is very meagre, but Mesnard has recently made some interesting observations on the occurrence of perfume in flowers (see *Pharm. Journ.*, [3], xxiii., 549).

According to his researches the oil is produced from tannoid substances (formed from the chlorophyll) in the absence of light and oxygen. Thus in the sepal the oil is found in the cells on the upper surface, protected from light and oxygen in the bud, and the tannin and pigments in the cells of the lower surface which have been exposed to light and oxygen.

He finds that the oils are thus formed in the jasmine, rose, and violet, but in the orange there are several oils, and in the *Tuberaceæ* the oil is found on the lower surface, and this abnormal result is probably due to the presence of a fixed oil and abundance of chlorophyll, for these oils are always found in the cells of palisade parenchyma, and thus result from chlorophyll.

In some cases the oil is produced by enzymes from other complex bodies, *e.g.*, Valerian, oil of bitter almonds, and possibly salicin.

Some doubt exists as to whether the oil exists as such in the vessels of the *Coniferæ*, or whether the oil is produced by the decomposition of this body.

We have thus left the question of the physiological function of these oils to the last, and the answer, it must be confessed, is more of a conjecture than statement of facts.

It is now well known that the food taken into an organism may be divided into two parts—that assimilated and used in the metabolic processes of the plant, and that which is not so used, and is thus rejected by the organism. In animals the portion not assimilated is excreted, and passes away from the organism, but in plants this is not always the case. In a few plants, as *S. Incrustata*, special apparatus exists for the excretion of material not required by the plant, but in most cases the plant disposes of the matter by secretion in certain sacs or vessels or renders them harmless by combination with other bodies, as calcium oxalate.

There is little doubt but that essential oils, resins, alkaloids, etc., fall under this category, and must be viewed as bye-products in the metabolic processes of the plant. They are not exactly degradation products, as gums, etc., but are substances produced by the plant which are of no use to it.

To summarise—the oils are found in vessels or cavities of protogenetic or hysterogenetic origin, and are produced by the protoplasm, probably as bye-products in the elaboration of the food material of the plant.

### CHEMISTRY.

The constitution of the oils is so varied that it is difficult to divide them into any well defined groups, but for the sake of convenience we may study them in the following classes :—

(*α*) Oils which are single chemical compounds, and whose constitution is known as oil of bitter almonds, wintergreen, etc.

(*β*) Terpenes or the constituents present in most essential oils, belonging to the hydrocarbons, as pinene, limonene, etc.

(*γ*) Other constituents in the oil, and to which often the peculiar odour is due. These may be further subdivided into aldehydes, ketones, alkyl salts, alcohols, phenol derivatives, etc.

(*α*) There are not many essential oils consisting of one body, but there are a few, the chief of which are—oil of wintergreen obtained from *Gaultheria Procumbens* and *Betula lenta*, essential oil of mustard, oils of rue, meadow-sweet (*Spiræa Ulmaria*), and bitter almonds. Of these the oil of wintergreen is an alkyl salt, and is 1·2 methyl salicylate, $C_6H_4{\cdot}OH{\cdot}COOMe$. Oil of meadow-sweet belongs to the same series of bodies, but is the aldehyde of the acid of which oil of wintergreen is the methyl ester. It is salicyl aldehyde, $1{\cdot}2C_6H_4{\cdot}OH{\cdot}CHO{\cdot}$. Both may be made by generic methods.

Oil of bitter almonds is of course benzaldehyde, and rapidly oxidises into the acid.

These all belong to the aromatic group, but the other oils belong to the aliphatic series. Essential oil of mustard is allyl-isothiocyanate, and bears the same relation to thiocyanate that carbamide does to a nitrile. It is prepared by a method which one would expect to yield thiocyanate, which is probably the case. By treating allylamine with $CS_2$ we get first the thiocyanate, which on distillation undergoes molecular re-arrangement, forming the iso-mustard oil

$$CS_2 + NH_2{\cdot}C_3H_5 = CS{:}N{\cdot}C_3H_5 + H_2S$$

$$\text{Though really } CS_2 + NH_2C_3H_5 = C_3H_5S{\cdot}C \vdots N + H_2S$$

$$\text{and } C_3H_5S{\cdot}C \vdots N = CS{:}NC_3H_5.$$

Oil of rue is a ketone, and consists of methyl nonyl ketone, $MeC_9H_{19}CO$, but its constitution is not fully known, as it is possible for several isomers of this formula to exist, and the particular formula for $C_9H_{19}$ has not yet been worked out.

(*β*) We pass on to the terpenes, with which are ever associated the name of Tilden (a former Bell Scholar) and Wallach.

These occur in very many essential oils, particularly those of the *Coniferæ*, which consist almost wholly of terpene, but many oils—oil of lemon, thyme, fennel, etc.—contain one or more of these terpenes.

They may be represented by the formula $(C_5H_8)_n$, and are closely related to cymene.

The number of isomers is much smaller than was at first supposed, and I only propose to mention the more important of them:—

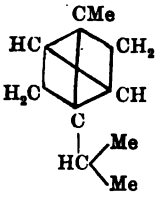
*Pinene* is contained in German and American oil of turpentine, oils of juniper, eucalyptus, sage, etc., and is obtained by distillation.

*Limonene* is found in oils of lemon and orange peel, oil of dill, oil of caraway, oil of bergamot, etc.

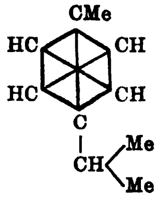
*Silvestrene* occurs chiefly in Swedish and Russian oil of turpentine.

*Phellandrene* occurs in eucalyptus oil, elemi, and fennel, and is distinguished from others by forming a crystalline compound with $HNO_3$. These different terpenes often exist in dextro-rotatory and lævo-rotatory forms, and often by a mixture of these we may get inactive bodies. Wallach has separated them and identified them by formation of their hydrochlorides, bromides, and nitrites.

They have not yet been synthesised, and their chemical constitution is not quite settled, but they are probably isomerides of dihydromethylisopropyl benzene, or dihydrocymene.



Terpene.



Cymene.

Though cymene has been prepared synthetically by Widman, from 1·4 bromcumene and MeI (*Ber.*, xix), it has not yet been found possible to hydrogenate it and produce the terpenes.*

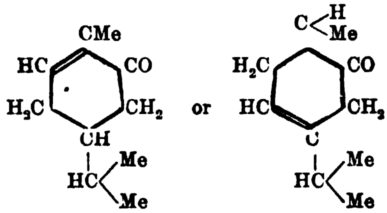
The terpenes, then, are a class of bodies of formula $(C_5H_8)_n$, of the probable composition dihydroparacymene, and exist in a number of isomeric forms which are identified by the compounds they form with bromine, hydrochloric, and nitric acids.

I have treated of the terpenes in a very cursory way, but as my time is limited I must now pass on to consider the next group (γ), the members of which are generally the aromatic constituents of the oil. Of late much light has been thrown on these constituents, but much remains to be done; but here, as in the terpenes, it is probable the number of substances present is actually less than was at first supposed. Since the camphors as a class are very much allied to the terpenes I shall treat those first.

They include camphor, Borneol camphor, menthol, and thymol. Of these we have:—

$C_{10}H_{16}O$......... Camphor, thymol, carvacrol.
$C_{10}H_{18}O$......... Borneol camphor and cineol.
$C_{10}H_{20}O$......... Menthol.

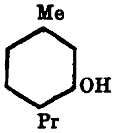
The constitution of camphor is still an open question amongst chemists, and several formulæ have been proposed for it. It has not yet been synthesised from cymene, to which it certainly bears a very close relation. The facts that camphor combines readily with HCN, phenyl hydrazine, and $NaHSO_3$, and that on oxidation it yields camphoric acid, and also that by treatment with $ZnCl_2$ and other dehydrating agents we get as a chief product paracymene, tend to show that it is a ketone of which Borneol camphor is the secondary alcohol, as camphor on reduction with Na yields Borneol camphor, which on oxidation yields camphor. There are several objections to this view, but Cazeneuve, in a masterly review of the whole state of our knowledge on this subject (*Bull.*, [3], ix., x., 38) ascribes to it the formula:—



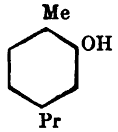
Camphor.

Thymol—one of the official stearoptens, occurs in ajowan and other oils. It is probably a tertiary alcohol, and is meta-hydroxycymene 1, 3, 4.

Carvacrol, readily obtained from camphor and a constituent of Spanish hop oil, is isomeric with thymol, but is the ortho-derivative. Their isomerism is represented as follows—



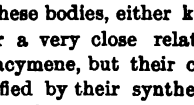
Thymol.



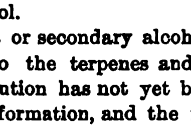
Carvacrol.

Borneol camphor is supposed to be a secondary alcohol, and on oxidation yields camphor, but in the unsatisfactory state of our knowledge concerning camphor little reliance can be placed on this formula.

Cineol, having the same empirical composition as the above, exists in many oils, but has been disguised under different names; it is an anhydro body and is identical with eucalyptol, cajeputol, etc., and is found in the oils of wormseed and *Lavandula Spicata*.



Borneol camphor.



Menthol.

Menthol, $C_{10}H_{20}O$—this body, so largely used in pharmacy nowadays, is a secondary alcohol, and on oxidation yields a ketone, which with sodium may be again converted into menthol.

These bodies, either ketones or secondary alcohols, bear a very close relation to the terpenes and to paracymene, but their constitution has not yet been verified by their synthetical formation, and the formula of camphor must be received with very great caution.

We have thus left a number of the aliphatic compounds and phenol derivatives of varied composition. I first propose to take a group of bodies very closely related to each other, which are found in many essential oils, but I must again remind you that our knowledge on this subject is somewhat meagre, and systematic investigation into their constituents has only been undertaken within the last few years.

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* Since the above was in type, Baeyer claims to have synthesised dihydrocymene (*Ber.*, 26, 232).

Many oils are omitted on account of insufficient data from which to generalise.

The group that I shall take includes the aldehydes, alcohols, ketones, and alkyl salts—all related to each other and often found in the same plant.

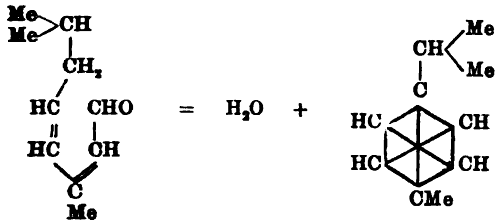
Of these several have the same empirical composition as the camphor group we have just discussed, but differ from them in being open chain compounds. They are:—

$C_{10}H_{16}O$......Citral or geraniol aldehyde.
$C_{10}H_{18}O$......Citronellic aldehyde.
Rhodinol.
Geraniol identical with linalool, coriandrol, and aurantiol?
$C_{10}H_{20}O$......Citronellic alcohol.

These are pretty widely distributed, and occur generally associated with terpenes in a good many oils.

*Citral.*—This is found in oils of orange peel, lemon, lemon grass, citronella, eucalyptus, etc., and can be prepared by oxidising geraniol, to which it bears a very simple relation, viz., that of aldehyde to alcohol.

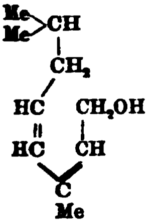
It is readily converted by heat into cymene, and the following formula has been assigned to it:—



Isobutylethylin-β-methylacrylic aldehyde. Cymene.

*Geraniol.*—The alcohol corresponding to citral occurs in a good many oils and has been given different names, but it is identical with linalool, coriandrol, and possibly aurantiol and rhodinol. It is found, to a large extent, in the Indian grass oils (92 per cent.), andropogon, lemon grass, Indian or Turkish geranium, ginger grass and vetivert, in lavender, coriander, linaloe, petit grain, and bergamot.

According to the view expressed above geraniol would be represented as shown.



Geraniol.

Citronellic aldehyde exists in large quantity in oil of citronella, and is isomeric but not identical with Borneol and geraniol. On reduction it yields citronellyl alcohol, which is also found in citronella oil, and their constitution is supposed to be β-methyl δ-isobutylallylacetaldehyde—

$\genfrac{}{}{0pt}{}{CH_2}{CH_3}{>}CH\cdot CH_2\cdot CH{:}C\cdot Me\cdot CH_2\cdot CHO\cdot$, with the alcohol $CH_2OH$ replacing CHO in the formula for citral.

*Rhodinol*, isomeric with geraniol, is the elæoptene contained in rose oil, and may be represented by a-propyl δ-propylcrotonylenemethylcarbinol—

$$CH_2 : CPr\cdot CH : CH\cdot CHPr\cdot CH_2OH.$$

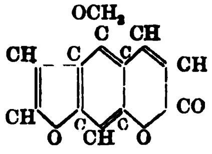
These bodies, though of same empirical composition as the camphors, differ greatly from them, but they are very closely allied to each other. They exist in plants of widely different orders, and no doubt further research will prove them to be contained in other oils. Closely allied with them in the oils are the alkyl salts of these alcohols—generally the acetate.

Geraniol acetate, $C_{10}H_{17}CH_3CO_2$, occurs in oils of lemon, bergamot, linaloe, and lavender: and aurantiol acetate, either identical or isomeric with the above, in oil of petit-grain. These we should expect to be fragrant bodies, recalling the alkyl salts of amyl and valerian, and in *A. nobilis* we have amyl and butyl tiglinates and angelicates with other alkyl salts. This I think is a fair and general account of the bodies belonging to the aliphatic series, and before passing to the phenol compounds, I shall give an example of the constituents of an oil showing how my generalisation applies.

Oil of bergamot (*Citrus Bergamia*) contains:—

| | | | |
|---|---|---|---|
| 40 | per cent. | limonene | terpenes described under that head. |
| 10 | „ | dipentine | |
| 25 | „ | geraniol—alcohol $C_{10}H_{18}O$. | |
| 20 | „ | geraniol acetate. | |
| 5 | „ | bergaptene. | |

Bergaptene is a body supposed to be the lactone of bergaptenic acid, a body allied to coumarin, and would be represented thus—



Bergaptene.

We see therefore in this oil the terpenes, alcohol, and alkyl salt, and another body in very small quantity and possibly formed from others.

I now pass on to those constituents which belong to the benzene group proper, though thymol described under camphors really comes under this category, but most of them may be regarded as derived from benzene rather than paracymene.

The most important are:—

*Anethol*, $C_{10}H_{12}O$, which occurs in oils of fennel, aniseed, pimpinella, and star anise.

*Eugenol*, $C_{10}H_{12}O_2$, which occurs in oils of cloves, cinnamon sassafras, canella, and pimento.

*Methoxychavicol*, $C_{10}H_{12}O_2$, is found in dried betel leaves.

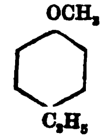
*Safrol*, $C_{10}H_{10}O_2$, occurs in oil of sassafras.

*Carvol*, $C_{10}H_{14}O$, in oils of dill and caraway.

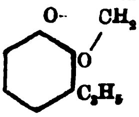
Cinnamyl aldehyde and acetate, in oil of cinnamon.

All these are well known bodies, their constitution has been determined except carvol, about which there is some doubt.

Anethol is 1·4 methoxyallylbenzene.
Eugenol is 1·2·3· methoxyallylphenol.
Methoxychavicol is 1·2·4· methoxyallylphenol.
Safrol is eugenol $-H_2$ and contains a methylene group.



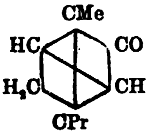
Anethol.



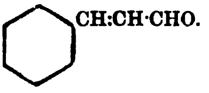
Safrol.

Carvol is keto-dihydrocymene, and is more nearly allied to the cymene group, with which, properly speaking, it should be placed

Cinnamyl aldehyde and acetate, of course, are well known, and do not need to be described here.



Carvol.



Cinnamyl aldehyde.

The very close connection between anethol, eugenol, and safrol is worthy of notice, as all are derivatives of methoxyallyl benzene, and bear a close relation to each other. With these I finish the second section of my paper, and though I have only skimmed over the surface of the subject, I trust I have not made any great omissions. To summarise—the constituents of most oils are terpenes of $(C_5H_8)_n$ mixed with the substance to which the odour is due, which may be alcohol, ketone, aldehyde, alkyl salt, or phenol derivative. In many cases alkyl salts are present, and to them very often the odour is due, but it is to be hoped that a thorough investigation will be made into the constituents of the oils. Much has been done in this direction, notably by Semmler, and soon, I trust, our imperfect knowledge will be much extended. I must remind you that in many cases the formulæ I have given you are not, to my mind, proved, but they show the affinities of the body. I have purposely omitted many oils whose constituents are known only by empirical formulæ and names, such as cubebic acid, etc., because I consider our knowledge concerning them is not satisfactory enough to generalise upon.

## CAMPHOR TRADE OF FORMOSA.

The trade in camphor shows a very satisfactory improvement and bids fair to become a very important factor in the trade of South Formosa. 5441 cwts. of camphor were exported to Hong-Kong as compared with 2524 cwts. in the preceding year. The Government monopoly for a long time rendered it impossible for foreigners to take any part in the trade. In 1889, 759 cwts. only were exported. In 1891 the export reached 2524 cwts., but owing to the heavy so-called frontier defence tax, which was imposed at the time the Government monopoly was abolished, it did not seem likely that any great expansion of the trade would take place. The high prices ruling in Hong-Kong have, however, induced foreign merchants to take an interest in the trade, and there are now several foreign firms employing Chinese agents to purchase camphor in Mid-Formosa. The result is that the export for the year under review has risen to 5441 cwts., and the trade seems to show every prospect of increasing. The price for camphor delivered in Hong-Kong ranged from £4 16s. to £7 10s. per picul of 133⅓ lbs., and at one time rose to £8 14s. At these rates very handsome profits were made, and merchants could afford to pay the heavy tax alluded to above. The central districts of Formosa are very thickly wooded, and there is no fear of the camphor supply becoming exhausted for many years—some hundreds, the Chinese declare; still it is a matter of much regret that the officials take no steps to enforce planting. These districts are apparently more accessible to Chinese than those further north, for so far they have not suffered from savage raids, and the camphor distillers work in peace undisturbed by their neighbours on the other side of the frontier. From the north, on the contrary, we hear not unfrequently of distilleries broken up and distillers murdered. Although the Government monopoly has been abandoned, there are not wanting signs of an attempt on the part of certain subordinate officials to create a monopoly in one of the richest of the central camphor districts. In Yün-lin, lying to the east of Chaughwa, there are one or two Chinese hongs engaged in the camphor business. These hongs give employment altogether to six camphor distilleries, the only ones at present in the place. Foreign merchants are anxious to start a business in Yün-lin, but are prevented by the action of the so-called Camphor Office, the official in charge asserting that under the camphor regulations of 1869 foreign merchants or their Chinese employés are allowed to purchase camphor up country, but that no provision is made for their employing natives to distil camphor; that, in consequence, unless they can purchase camphor from the distilleries already at work they cannot be permitted to engage in the business, as to hire labour for the distilling of camphor is contrary to the regulations since made by the Governor of the island. The objection raised is of course frivolous in the extreme, but not the less likely on that account to interfere seriously with the interests of the foreign merchants engaged in the camphor trade here (*Consular Report*, 1192, 7).

## EXPORT TRADE OF SUAKIN.

There was great activity in the gum trade during 1892, but at the close of the season the merchants were considerably out of pocket. Early in the year there was a great demand for this commodity in Europe, and the merchants embarked in the trade with such eagerness that the markets were soon flooded; prices came down suddenly, and to an extraordinarily low figure. One firm sold gum in London at £17 6s. the ton, and afterwards parted with some of finer quality at £6 the ton. While the home markets were thus running down, the buying price at Suakin did not fall in proportion, and the result was heavy loss. The best qualities of picked Kordofan gum are sent from here to England. One of the dealers makes it up in cases of fourteen different qualities, determined by the size of the pieces, their relative hardness and colour. In the retail trade it is bought up by chemists, confectioners, and varnishers. There has been an improvement in the senna trade. The bulk of last year's crop was exported to Egypt unpicked. That which went to England was first cleaned and sorted here, and fetched high prices. It is made up in three qualities: (1) best picked leaves, (2) broken leaves, (3) pods. The senna pods are exported chiefly to Trieste, and are used for imparting a gloss to silk fabrics. The senna plant grows wild and freely all over the Eastern Soudan. The best quality comes from the north (near Rowayyah), and inferior kinds from Sinkat and Erkoweit (*Consular Report*, 1206, 3).

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, JULY 1, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## READY-MADE PHYSIC IN GERMANY.

THE production of medicinal preparations and specialties in factories is giving rise to a vehement dispute between the members of the German Apotheker-Verein on the one hand, and Herr DIETERICH, of Helfenberg, supported by the *Pharmaceutische Zeitung*, on the other. It is contended by the latter that the practice complained of by the apothekers has really been originated by them, and by the alteration of the law, which permitted the purchase of such medicinal articles as acids, ether, quinine, etc., as well as pharmaceutical preparations such as tinctures, plasters, ointments, etc., provided due care were exercised in ascertaining by analysis that the articles so purchased were of proper quality and character. The apothekers' reply to this is to the effect that the statement put forward does not correctly represent the facts of the case. It is not disputed that some galenical preparations, as well as chemicals, can be better manufactured upon a large scale, in factories, than by individual pharmacists, and it is admitted that the very general practice of purchasing such articles has not been destitute of some advantage in certain respects. That, however, is not the matter complained of, and it is contended that the justification sought for, on that ground, ignores the real ground for complaint against manufacturers, which is their interference with the proper business of the apotheker, by making in a wholesale manner medicinal preparations—ready-made physic, in fact. Not content with the profitable result obtained by the manufacture of official preparations, they desire to make them still more lucrative by converting them into medicine, compounded ready for administration. The means by which it is attempted to subvert the exclusive right of the apotheker to perform the work of compounding medicine is that of attracting the attention of medical men and of the general public to such compounds by advertisements containing recommendations and puffs, thus exciting desire to prescribe or to purchase them, and eventually, by creating a demand for the articles, constraining the apotheker to undertake their sale. The distinction here made between the terms "arzneimittel" and "arznei" is that the latter signifies medicine as compounded or dispensed by the pharmacist, while the former denotes the official preparations or materials from which it is compounded. In an address on this subject, delivered by Dr. FRIEDLANDER at a meeting of the Berlin branch of the Apotheker-Verein, he refers to the methods adopted for the purpose by the manufacturers of ready-made medicines as being precisely those followed by the proprietors of secret nostrums, the similarity between them being completed by the use of trade marks, directions for use, recommendations of efficacy for all possible maladies, and the addition of testimonials from medical authorities. But there are, even in Germany, some who look with approval upon this development of the system under which pharmaceutical preparations and even medicines are becoming more and more the produce of factories. It has, indeed, the one recommendation of being convenient for those in a small way of business, and it is chiefly from that point of view that the arguments put forward in Dr. FRIEDLANDER's address have been controverted.

## THE MEDICINE STAMP DUTY.

IN commenting upon the complaints made by chemists and druggists as to the incidence of stamp duty upon preparations sold by them, the *British Medical Journal* expresses the opinion that it is only by overstepping the proper limits of pharmaceutical practice that ground is provided for the claims made by the Board of Inland Revenue. It is considered that everything really requisite, in the way of pharmaceutical description or of directions for use, may be stated upon the label of a medicinal preparation without incurring liability to stamp duty, and that it is only by introducing, in the label or other descriptions, the names of diseases, for the relief or cure of which the medicine is useful, that medicinal preparations are rendered liable to stamp duty. Our contemporary regards that proceeding as being outside the business of the chemist and druggist, and that it amounts to a "holding out or recommendation"—"an extra pharmaceutical function by the assumption of which the nostrum-monger is very properly brought within the scope of the Act." Hence the conclusion is that the general tendency of the Act to repress irregular and amateur medication, by putting a check upon the trade in secret remedies or nostrums, "is beneficial to the public, just towards the medical profession, and in no way calculated to interfere with the legitimate business of chemists and druggists." This is a view of the matter that will not commend itself to all of our readers; but to some at least it will appear worth considering whether a more strict observance of the principle above indicated would not conduce to the promotion of the best interests of pharmacy as well as of medicine.

## THE TITLE OF APOTHECARY.

Though the greater part of a century has elapsed since the apothecaries of this country acquired legal recognition as practitioners of medicine, surgery, and midwifery, the title conferred by the diploma of the Society of Apothecaries has failed to satisfy its holders as enabling the public to understand the nature and extent of the qualification in the manner that this is done by the titles conferred by the Colleges of Physicians and Surgeons. A correspondent of the *Lancet* refers to this fact as being "an anachronism," and he publishes some letters from the Clerk to the Society of Apothecaries, which he considers are unsatisfactory replies to the inquiries whether steps are being taken to obtain for the Society's licentiates a title more in accordance with their qualification. He considers the title of "apothecary" obsolete as signifying a medical practitioner. But it may be regarded equally obsolete as denoting a "dispenser of medicine." Indeed the diploma of the Society, though legally sufficient, is commonly considered to fall so far short of adequate medical qualification, that this relic of the confusion of medicine and pharmacy may itself be regarded as an "anachronism."

## SPURIOUS AND ADULTERATED DRUGS.

At a recent meeting of the Berlin Pharmaceutical Society, Dr. Waage has directed attention to this subject. In the first place he pointed out that while the traditional statements found in manuals, and copied from one book into another, are not to be relied upon, there is need for more careful examination of drugs for the purpose of detecting foreign admixtures. In dealing with individual drugs, various instances of partial falsification were mentioned, and the influence of habit in determining the use of inferior drugs was illustrated by the case of cinchona bark, the large quills known as "druggist's bark" being frequently very poor in alkaloid, while other kinds, less attractive in appearance, are more suitable for medicinal use. In such cases a direct determination of the alkaloid is the only criterion of value, and it was recommended that this test should always be had recourse to in the purchase of such drugs as cinchona bark, opium, ipecacuanha, etc.

## THE REMEDY FOR COMPETITION IN PROFESSIONAL OCCUPATIONS.

In reference to the excessive competition from which the medical profession is suffering, a correspondent of the *Lancet* makes some sensible remarks which are not without application to the existing position of chemists and druggists. His view is that the General Medical Council cannot deal with the particular symptoms to which attention has been so forcibly directed of late, but that it can remove their cause. In that sense he suggests that if entrance to the medical profession were made "so difficult as to exclude the huge crowd of half-educated and dull lads who now elbow us and degrade us in ever increasing numbers" the Council would have the sympathy and support of the nation, which would recognise the action as "an attempt to produce a better article, whilst the attack on medical aid associations might be considered only an effort to get a higher price.

## THE NECESSITY OF TECHNICAL TRAINING.

The *Lancet* mentions the fatal mistake made by a nurse, in administering carbolic acid instead of a cough mixture, as evidence of the importance that may attach to seemingly minute details of technical training. To place a bottle containing poison upon a table amongst other bottles containing medicine, is considered to have been a serious oversight, and the only possible protection against such a mischance as ensued is to be looked for in thorough training to a carefully devised routine of work. This case serves to show the inefficacy of merely mechanical devices, such as corrugated bottles, etc., for preventing accident with poisons. The most serious omission, however, was that of not reading the label upon the bottle before making use of its contents. The accident also serves to show the necessity of confining the handling of poisons to competent persons.

## THE PATENTING OF MEDICINES AND PHARMACEUTICAL PREPARATIONS.

A vigorous opposition is being made by the members of the German Apotheker Verein to the modern system of obtaining patents for medicinal preparations, which has been carried to such an extent in Germany that it seems likely to place all kinds of pharmaceutical manipulations under the control of patents. Proceedings are to be taken with a view to dispute the validity of some of these patents, and it is thought that, should the attempt not be in all instances completely successful, it will at least have the effect of making the Patent authorities more cautious in future in granting protection to questionable inventions.

## IMPURE TABLE WATER.

A report recently presented to the French Ministry of Public Works appears to show that the frequent use now made of various kinds of bottled table water, with the view of avoiding the dangers attending the drinking of polluted water, may sometimes fail to be effectual, even when the water is "bottomed well with brandy." It is stated that on analysis of several samples they proved not to be natural water but manufactured from Seine or well water. The officials of the Municipal Laboratory in Paris have therefore been instructed to make a general examination of bottled table water, and the *Lancet* recommends travellers to have recourse to a trustworthy pharmaceutical chemist, for providing themselves with the particular table water they desire to have, and not to think twice over an extra outlay, which may mean immunity from disease, or worse.

## PARLIAMENTARY REPRESENTATIVES OF PHARMACY.

In the elections for the German Reichstag there are among the candidates several qualified pharmacists and one owner of an apotheke, but none of them have yet been returned, and the *Apotheker Zeitung* expresses regret that in the event of a reorganisation of pharmaceutical regulations becoming the subject of discussion by the Reichstag, pharmacy does not appear likely to be represented in the national Parliament.

## CHOLERA AND THE FILTRATION OF WATER.

PROFESSOR KOCH, in an article in the *Zeitschrift für Hygiene*, draws attention to the practical importance of efficient filtration of water as a defence against cholera. Though Hamburg and Altona are connected so as to form practically one town, and both obtain their water supply from the Elbe, they have been very differently affected during the late outbreak of this disease. Other things being equal, it would naturally be expected that Altona would suffer worse than Hamburg, since it obtains its water from the river below the city, and consequently after contamination. But whilst the purer water supplied to Hamburg is unfiltered, that supplied to Altona is filtered through beds of sand. These act by the formation of a slimy layer on their surface and, when the water is prevented travelling at a quicker rate than 100 mm. per hour, it is so well filtered that it does not contain more than 100 germs per c.cm., and these are perfectly harmless ones. As a consequence it was found, when the cholera was rife, that a sharp dividing line indicated the limits of the two water supplies, Altona and part of Hamburg receiving the same service being almost completely free from the disease while the epidemic was at its height close at hand. Domestic filtration of water is regarded by KOCH as thoroughly unreliable, water naturally filtered being, in his opinion, much better when the process of filtration is efficiently conducted and care taken to avoid after-contamination of the water.

## THE ROYAL SOCIETY AND TRADE CERTIFICATES.

AT a recent meeting of the Council of the Royal Society an expression of opinion as to the publication in advertisements of certificates and statements signed by Fellows of the Society was adopted and ordered to be communicated to all the Fellows. In this it is pointed out that in such cases mere analyses or simple statements of fact are occasionally supplemented by expressions of opinion and laudatory passages regarding the subject matter of the advertisements. The PRESIDENT and Council feel that in certain instances due regard has hardly been paid to the status and dignity of the Royal Society, and they are of opinion that the issue of such certificates tends to act injuriously upon its reputation. They are, however, confident that when attention is called to the subject, all the Fellows will endeavour to express any statements relating to matters of trade or manufacture in such terms that no suspicion of mercenary motives or commercial partisanship can possibly attach to them.

## PRESENTATION TO MR. F. BROWNE.

AT the meeting held on Thursday, June 22, to conclude the business of the School of Pharmacy Students' Association for the present session, a pleasing ceremony took place, when a presentation was made to Mr. FRANK BROWNE, late Assistant-Demonstrator in the School Laboratories, on the occasion of his departure for Hong Kong. This consisted of a large number of valuable works of reference, which had been purchased by the aid of subscriptions contributed by many past students of the Society's School, in addition to those at present being instructed there.

## CANONS AND SMOKE BALLS.

THE fact that Canon FLEMING has, by the advice of friends, retired from the Chairmanship of the Carbolic Smoke Ball Company will be received with general satisfaction. Though the Canon has explained that he dealt with the smoke ball *secundum artem* as an "article of faith," this addition to the orthodox thirty-nine was so decidedly an article of trade that his resignation of a position adopted without sufficient forethought may be regarded as indicating a wise discretion.

## MEDICAL MEN AND PHARMACOPŒIA REVISION.

ANOTHER correspondent of the *British Medical Journal* contributes his opinion on the subject of Pharmacopœia revision. He asserts that at the present day too many drugs are brought before practitioners, and that old useful remedies are thrown aside to give place to untried ones, whilst unnecessary labour is cast upon those who would make themselves conversant with the doses and properties of all medicines. It is suggested that the new Pharmacopœia should be "so arranged as to render it easy of study, with proper defined doses easily committed to memory, the object being not only conciseness, but usefulness, for unless such facilities be offered it will be impossible for those who have been engaged in practice for several years to make themselves thoroughly acquainted with the numerous details."

## INSPECTION OF DAIRIES IN GERMANY.

THE Association of Veterinary Practitioners in Berlin has addressed a memorial to the President of Police on the subject of the sanitary condition of the local dairies, and in consequence of the representations made an official inspection has been carried out. It has been found that many of the dairies are not in a satisfactory condition, and measures will be taken to enforce better observance of hygienic requirements in future.

## LONDON ORPHAN ASYLUM.

IT is gratifying to record that the appeal made by the VICE-PRESIDENT at the June Council meeting on behalf of the orphan, MARGUERITE T. MINETT, has resulted in her election to the London Orphan Asylum with the large total of 1632 votes. MINETT headed the poll, whilst the second candidate only polled 785 votes. We are requested to express the grateful thanks of Mrs. MINETT to those pharmacists who helped to bring about so splendid a result.

## SOCIETY OF ARTS.

THE ALBERT Medal of the Society of Arts for 1893 has been awarded in duplicate, one copy to Sir JOHN BENNET LAWES, and the other to Mr. J. H. GILBERT. The award is officially stated to be made "for their joint services to scientific agriculture, and notably for the researches which, throughout a period of fifty years, have been carried on by them at the experimental farm, Rothamsted."

## BOARD OF GUARDIANS.

WE are informed that Mr. JOHN EVANS, chemist and druggist, Temple Gate, Bristol, an associate in business of the Pharmaceutical Society, has been elected a member of the Board of Guardians for the ancient ward of Temple, in that city.

# Transactions of the Pharmaceutical Society.

## MAJOR EXAMINATION QUESTIONS.

### CHEMISTRY.

*Time allowed, Three hours.*

1. What is the constitution of an amido-sulphonic acid? Give an example.

2. What is the action of (*a*) ethyl bromide on sodium sulphite; (*b*) sulphuric acid on acetone; (*c*) water on benzal chloride?

3. Give a brief account of the chemical and physical properties of acetanilide, phenacetin, and phenazone.

4. 0·318 gramme of an organic acid yielded on analysis 0·8005 gramme $CO_2$ and 0·1442 gramme $H_2O$. Calculate a formula for it.

5. What is meant by "Calorific Power"? In an experiment to determine the calorific power of charcoal, 5 grammes of charcoal burned in oxygen to $CO_2$, raised 3 kilogrammes of water from 10° C. to 23·46° C: what is the calorific power of charcoal as determined by this experiment?

### PHYSICS.

*Time allowed, Three hours.*

1. In what way may the co-efficient of expansion of a liquid be determined, otherwise than by actual measurement of volume?

2. Explain why cooling is necessary in the working of a heat-engine.

3. How may an electric current be produced by heat: and by what electrical instrument may a rise in temperature be measured?

4. Describe some form of Thomson's Quadrant Electrometer. Define the meaning of "Ohm" and "Ampere."

5. Describe as fully as you can, the difference, if any, between the discharge from a Leyden Jar, a Ruhmkorff Coil, and a Magneto-Electric Machine.

6. What do you understand by the terms "Real Image" and "Virtual Image"? Draw a figure showing how these images are formed.

### BOTANY.

*Time allowed, Three hours.*

1. Give an account of the origin and uses of floral appendages.

2. Describe the conducting tissues of the Stigma and Style, and how such have arisen.

3. Give an exact and complete statement of the characters of these two plants, whereby the species may be recognised.

4. Make a section of this stem, and describe its parts, giving a diagram.

5. From what sources do plants obtain Nitrogen, and how is its assimilation accomplished?

6. Describe the protective formation found on plants whose internal tissues have been exposed by injury.

### MATERIA MEDICA.

*Time allowed, Three hours.*

1. Give the name, natural order, and habitat of the plant yielding Aconite. Explain how the official root may be distinguished from the non-official. What are its active constituents? Describe methods for their elimination, and give physical and chemical characters and tests.

2. Describe the source of Peruvian Balsam. How is it obtained? Mention the probable adulterants, and explain means of detecting them.

3. Discuss the chemical constitution of Trimethylamine. Describe its preparation, and give the sources from which it may be obtained.

4. Name the medicinal plants of the natural order Cucurbitaceæ, and give processes for the elimination of their active principles.

5. Describe, as far as you can, the sections of Calumba root, Canella bark, Cusparia bark, and Pareira root, submitted.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The last meeting for the session was held on Thursday, June 22nd, Professor Attfield, F.R.S., President, in the chair. The Secretary read the

### ANNUAL REPORT.

"The Executive Committee of the School of Pharmacy Students' Association has, since the election in November last, held three meetings for the transaction of the business of the session. At a meeting held December 1, 1892, the Secretary reported that nomination and voting papers had been issued at the commencement of the session to all members who had paid their annual subscriptions, and to all life members. The following members were appointed as a Committee of Reporters on the sciences allied to pharmacy:—Pharmacy, Mr. R. G. Guyer; Botany, Mr. H. A. D. Jowett; Materia Medica, Miss B. Shove; Organic Chemistry, Mr. E. J. Eastes; Inorganic Chemistry, Mr. F. Browne; Physics, Mr. G. A. Shaw.

"At a meeting held April 28, 1893, arrangements were made for botanical excursions on Saturday afternoons. It was decided that when the Cricket Club was playing in a suitable neighbourhood, the botanical expedition should be in the same direction, so as to form one party and obtain reduced railway fares. Visits have been made to Wimbledon, Sutton, West Drayton, Hendon, Twickenham, Epping Forest, and Watford, and have resulted in the collection of a considerable number and variety of specimens, lists of which have been published by the Editor of the *Pharmaceutical Journal.*

"The session again shows a slight increase over previous years in members and attendance at the meetings. The Association now numbers seventy-eight members, of whom eight are life members. Fourteen meetings have been held, and the total attendance has been 338, making an average of twenty-four at each meeting.

"The following twenty-six communications have been read at the meetings:—Introductory Address, by Mr. H. G. Greenish, F.I.C.; 'Proteids,' by Mr. E. White, B.Sc.; 'Modern Developments of Pharmacy,' by Mr. R. G. Guyer; 'Cake Saffron and Safflower,' by Miss A. E. Tilson; 'Note on *Solanum xanthocarpum*,' by Mr. R. Walkington; 'A Strychnos from Sierra Leone,' by Mr. F. A. Sturton; 'An African Kino,' by Mr. A. W. Southall; 'The Metallurgy of Iron,' by Mr. F. G. Parry; 'An Apparatus for Automatic Repercolation,' by Mr. D. Mitchell; 'Report on Inorganic Chemistry,' by Mr. F. Browne; 'The Action of Phosphorus on Metallic Salts,' by Mr. T. Tickle; 'Report on Botany,' by Mr. H. A. D. Jowett; 'An Examination of *Piper Ribesioides*,' by Mr. E. Brooke, F.C.S.; 'The Chemistry of the Farm,' by Mr. J. Golding; 'Homœopathic Pharmacy,' by Mr. E. Goulding; 'Report on Materia Medica,' by Miss B. Shove; 'Assay of Cinchona Alkaloids,' by Mr. E. H. Gane; 'A Visit to a Staffordshire Pottery,' by Miss M. Gibson; 'Applications of Electricity to Chemistry,' by Mr. F. Rose; 'The Dispensing Counter,' by Mr. W. Browne; 'Recent Researches on Sugars,' by Mr. H. T. Durant; 'Report on Organic Chemistry,' by Mr. E. J. Eastes, F.I.C.; 'Some Interesting Indigenous Plants,' by Mr. W. Moore; 'Report on Physics,' by Mr

G. A. Shaw; 'Chemical Action of Light,' by Mr. G. S. Jones; 'Stereo-Chemical Theories,' by Mr. E. H. Gane.

"These papers are being copied in type and bound for presentation to the Pharmaceutical Society's Library, where the papers read at previous sessions will be found.

"The Treasurer's accounts, to be presently audited, show that the receipts from members' subscriptions and interest on invested funds have amounted to £9 16*s.* 6*d.*, and the expenditure to £8 12*s.* 1*d.*, so that the balance is increased to £24. This balance constitutes a Research Fund, available to members who wish to undertake any experiments or investigations intended to form the subject of papers to be read before the Association."

Messrs. Mainprize and Ward were subsequently appointed to audit the Treasurer's accounts, which they reported to be correct. The adoption of the report was then moved by the President, seconded by Mr. J. Golding, and carried unanimously. A vote of thanks to the President and officers was carried by acclamation.

### *Presentation to Mr. Frank Browne.*

The ordinary business of the Association being then finished, Mr. Tickle, Bell Scholar, said there was yet another matter in which all present were interested. He alluded to the near departure of Mr. Frank Browne, Assistant-Demonstrator in the Society's Chemical Laboratories, for Hong Kong, where he was about to take up a post under the Government. Having referred to Mr. Browne's work as Secretary of the Pharmaceutical Football Club, among other services, in the names of past and present students the speaker then presented him with a valuable set of books, which he hoped would be accepted as a slight memento of their esteem and good wishes for his future.

Professor Attfield having endorsed these remarks, Mr. Browne said that he felt quite unable to adequately express his thanks for this kind testimonial. He earnestly hoped that the Pharmaceutical Football Club would continue to grow and continue its useful work. He would be very glad to see the spirit of co-operation for recreative and other purposes, as found in the Football Club, imparted to those beginning the study of pharmacy in all places. He hoped that those present and himself might ever continue to hold each other in mutual esteem.

## LONDON INSTITUTION.

### BACTERIA, THEIR NATURE AND FUNCTION.*

A well-known English writer a short time ago informed the public that Professor von Pettenkofer, the distinguished veteran in sanitary science in Munich, expressed the opinion that "the atmospheric envelope of this globe is at present in a bacillophil humour." Expressions such as these have been repeatedly used in one form or another, some more, some less witty; the intention being, of course, to convey an exaggerated impression of the frame of mind of over-zealous enthusiasts. By such expressions more or less distinguished speakers and writers have been enabled to exhibit the smartness of their phraseology. Thus one distinguished professor relieved the anxiety of his students by the jocular observation that idleness and laziness will probably be found to be due to a specific bacillus, while another no less profound writer enunciated that crime and inebriety are probably due to bacilli. With regard to the distribution of bacteria, as well as with regard to their action, we meet with statements which are almost made humorous by smartness of exaggeration. Under the cover of the title "Science Notes," one of the London papers offered to its readers for breakfast the following palatable dish:—"In a grain of butter you have 47,250,000 microbes; when you eat a slice of bread and butter you therefore must swallow as many microbes as there are people in Europe." Here it ought to be stated that a grain of solid matter of *London sewage* contains only a small fraction of this number of microbes. But leaving these silly exaggerations and those grotesque sayings to their authors for further improvement, it is nevertheless well established that a considerable number of phenomena in nature are intimately associated with bacterial life. The world of bacteria is comparable to an unseen flora which, in variety of character, of activity and importance in the economy of nature, compares with the visible flora, and in its extension and area of distribution is as great as, in some respects greater than, that of the visible vegetable and animal kingdom. Though unperceived by the unaided eye, this bacterial world forces itself, by its multifarious activity, continually on our attention; it comes into prominence by the vast effects, the slow but far-reaching results which it produces on man, animal, and plant, for good and for evil, in life and in death. Some of these actions I shall have the honour to bring before you this evening, and you will see that while there are bacteria whose actions are undesired and not conducive to the well-being of man or animals, there are others which are of the greatest service both to them and to plants, and are an essential and integral part in the economy of nature.

I spoke just now of the bacterial world as of an unseen flora; I meant by this a part of the vegetable kingdom not perceived by the unaided eye, though, as you will see, it is easily brought to perception by a variety of means. The individuals that constitute the bacterial world are, as is no doubt known to you, of such extremely minute size that only by the aid of the microscope can they be seen, their size being often less than $\frac{1}{25000}$ or $\frac{1}{30000}$ part of an inch, rarely more than $\frac{1}{3000}$ part of an inch. They are spoken of as having the character of plants, because the elements, like those of a plant, are invested in a sheath of cellulose, within which is contained the essential part, the living protoplasm, the bacterial individuals being in fact comparable to unicellular plants, in which, however, no definite cell nucleus has been hitherto demonstrated. It ought, however, to be mentioned that various observers have attempted to show, and, by complex methods of staining, have succeeded in showing in some bacterial species the existence of parts which resemble, and which are considered as comparable to, the nucleus forming an integral part of the typical vegetable cell.

In speaking of bacteria as of plants there are other than morphological characters which guide us in this designation; bacteria resemble plants in this essential, that they possess the power to build up, out of simple organic compounds, the most complex substances such as the protoplasm of their own bodies. There are known not a few bacterial species which grow and multiply, *i.e.*, which build up their highly complex nitrogenous albuminous substances at the expense of relatively simple nitrogenous bodies, such as ammonium tartrate, urea, and allied substances, or which can do this even by the absorption of free nitrogen of the air. Other species require for their growth and multiplication as complex nitrogenous substances as the animal body itself, and like this latter are capable of breaking them up into simpler combinations. Pathogenic bacteria—many of the species concerned in the decomposition and putrefaction of albuminous substances—belong to this group.

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* Lecture delivered at the London Institution, on February 27, 1893, by E. Klein, M.D., F.R.S., Lecturer on General Anatomy and Physiology at the Medical School of St. Bartholomew's Hospital, London.

All bacteria multiply by division; hence their name, schizomycetes, or fission fungi, the typical process of multiplication consisting in the enlargement of an individual, and in subsequent splitting into two by fission, at the conclusion of which process two new individuals are the result, each of them capable of enlarging and again dividing in the same way into two, and so on. But it can be easily shown by comparative observations and examination of suitably prepared specimens of artificial cultures of the different species that not seldom the process of multiplication does not follow this line.

I show you here a lantern slide of a microscopic specimen of one of those species which, owing to the spherical or nearly spherical form of the elements, is called a coccus, or micrococcus; and owing to the manner of growth in clusters and continuous masses, is called a staphylococcus; this microscopic specimen has been obtained by the method of making "impression preparations," that is to say, by means of a thin glass pressed on to a recent, *i.e.*, a young, colony or colonies growing on the surface of a solid medium, an exact impression is obtained of the growth, and a good and correct insight is obtained of the manner in which the colony enlarges, and the way in which the individuals constituting the colony grow and multiply. You see in this photographic representation that there are a good many individuals many times (4-10 times) as large as others, that some of these large elements are uniform, while others show just the indication of a transverse fissure by which the large element is dividing; still others show two fissures at right angles, by which the big element becomes divided into four smaller ones. But you see also the majority of cocci are only minute dots, some in pairs, others in clusters, the former looking like two demilunes separated by a straight clear line; in fact, this latter appearance denotes the typical manner in which one coccus, having first enlarged a little, divides into two small elements. But the presence of the huge elements mentioned above tells us also that one coccus may go on growing to a very large size without dividing, and having reached this huge diameter, then commences to divide, first into two, then into four, eight, and sixteen individuals of the typical size.

I show you here an impression preparation of a recent colony of another species (*Bacillus coli*), the individuals of which are rod-shaped or cylindrical, and are what are called typical bacilli. Here the great majority of the individuals are of cylindrical shape and of a fairly uniform size; a few only are shorter, and arranged in the form of a dumb-bell, indicating that one of the longer individuals has by fission split up into two smaller individuals. But if you look at a third impression preparation, of which I here show you a photograph (Proteus), you will see that while there are a few chains of cylindrical bacilli, indicating successive division of the individuals and the new off-springs remaining joined end to end—thus constituting what is spoken of as a leptothrix—there are other threads in the colony which either show a division into cylindrical elements only imperfectly or not at all, appearing uniform and unsegmented threads; where the segmentation is imperfect the individuals are of very various lengths, some not longer than those typical bacilli in the first-mentioned chains, others three and more times as long. These appearances indicate that the multiplication of the bacilli does not always take place in that typical manner in which it is generally represented, viz., one individual elongates a little, then splits up into two short individuals; but a bacillus may go on elongating till it reaches the manifold length of the typical rods, and having reached this great length, then segments into a great number of cylindrical rods. This mode of multiplication can be made out not only in these impression preparations, but can be actually observed in the fresh condition under suitable conditions, *e g.*, on the warm stage.

That this mode of growth appertains not only to cocci and bacilli, but also to the third morphological group of bacteria, viz., the vibrios, or spirilla, is ascertained by the fact that often one vibrio, *i.e.*, a more or less curved rod-shaped individual or a comma-shaped bacillus, grows into a uniform homogeneous spiral or wavy thread, which is capable of splitting up into a number, *i.e.*, a chain of comma-shaped vibrios.

We have then the typical mode of division, by which one individual, a coccus, or bacillus, or vibrio, as the case may be, slightly enlarges, and then by fission divides into two; or an individual continues to grow to abnormal size or length, and then splits up into a series of individuals of the typical size; this latter mode of multiplication implies a deficiency of fission for the time being, and is not, as far as can be made out, due to any abnormal conditions affecting the growth, for in many species this occurs in recent and active colonies under conditions which in all other respects must be pronounced as favourable for growth and multiplication.

Another interesting appearance, shown by some species of bacteria, is generally ascribed to degeneration or involution, *i.e.*, the bacteria assume peculiar abnormal shapes stated to be due to abnormal influences, insufficient or unfavourable soil, unfavourable temperature, etc., etc.; but while it is true that such influences do produce abnormal shapes, disintegration, etc., there are certain changes in shape that are observed in some species of bacteria while growing under perfectly favourable conditions and with the normal rapidity, and which are anything but degenerating.

A recent colony of the *Bacillus anthracis*, like the photograph I show you here, growing on nutritive gelatine, is made up of twisted and convoluted threads of cylindrical rods, which threads are seen to shoot out and to extend like filaments from the margin of the colony. Now, you notice in the next photograph that instead of these filaments being made up of the typical cylindrical rods, the former consist of relatively huge spindle-shaped or spherical masses many times the diameter of the typical rods. The threads of this colony are perfectly active, and are growing with vigour and in perfectly normal circumstances as regards soil, temperature, and all other known conditions. As a matter of fact, a few days later, as comparative specimens show, all threads may be, and as a rule are, again of the typical aspect, *i.e.*, uniform threads and chains of rod-shaped elements.

Another photograph which I show you here is from a colony of the bacillus of diphtheria. Here also you notice the appearances already mentioned of the anthrax bacilli, viz., shorter or longer filaments, in which some of the elements show a conspicuous enlargement: pear-shaped, spherical, or club-shaped. Such forms are not involution forms: they occur in vigorous and actively growing young colonies.

A still further illustration, and one of great importance, is shown by this photograph, illustrating a similar change of the tubercle bacilli. This change has now been confirmed by several independent observers. The typical tubercle bacilli of human or bovine tubercle and of early cultivations are cylindrical rods. In cultivations of long duration but still actively growing you notice forms which are more filamentous, and, as in the present illustrations, are branched filaments with club-shaped enlargements.

From all this the conclusion is justified that in all these cases of bacilli the typical cylindrical bacilli show occasionally an indication that reminds one of forms belonging to the higher or mycelial fungi, in which the growing filaments remain unsegmented and become thickened and even branched. These thickened, branched, and club-shaped forms of the bacilli would correspond to an atavism, and would recall a probable former fungoid phase in the evolutional history of these bacilli.

The next point to which I wish to call your attention is the rapidity with which multiplication of the bacteria takes place. This differs according to the amount and nature of the nutriment or soil on which they grow, and to the temperature. While some bacteria multiply even at lower temperatures at a great rate, others do so only at higher temperatures. But in order to give you an idea of the power and the rate of multiplication I may ment on the following:—Direct observations show that the rate at which bacteria divide at a temperature of 20° C. varies from eighteen minutes to thirty minutes or a little longer, and at higher temperatures correspondingly faster. A tube of nutrient broth was inoculated with a trace of the growth of a staphylococcus (*Staphylococcus pyogenes aureus*), the number of cocci introduced into the tube having been previously determined to be 8 per cubic centimetre. The tube was then kept at 37° C.; in the first twenty-four hours the cocci had multiplied to 640,000 per cubic centimetre; in the second twenty-four hours to 248 millions per cubic centimetre; and in the third twenty-four hours to 1184 millions per cubic centimetre.

A point of interest is the motility exhibited by some bacteria. In some species most, in others comparatively few, individuals show active locomotion, spinning round and darting to and fro; in many other species no motility is observed. In the motile species it is known that this motility is due to the presence and active motion of cilia or flagella, and these have been seen and photographed in former years in some of the larger forms, but only within recent years has it been possible, by means of new methods (Löffler), to actually demonstrate in the smallest forms these flagella, and here the remarkable facts have been shown that while some possess only one flagellum at one end, in other species the bacillus possesses a bundle of them, or is covered with the flagella on its whole surface. I show here some photos of the flagella, one possessing two flagella at one end (spirillum volutans), the other (cholera bacillus) one at one end, and the third (typhoid bacillus) is covered with quite a number of flagella.

A not less interesting point is the formation of spores: the only trustworthily ascertained mode of spore formation is that which is called endospores, as is shown in the following photograms; a bacillus at a certain phase develops in its protoplasm a minute glistening granule, this increases in size and becomes oval, while the rest of the substance of the bacillus becomes pale, swells up and gradually degenerates and disappears, leaving the fully formed oval bright spore free. These spores are of great resistance to temperature, chemical obnoxious substances, drying, etc., so that even after long periods and various adventures, when again brought under proper and suitable conditions they are capable of germinating into the bacilli. These then grow and divide and continue to do so, producing new crops. Non-sporing bacteria are for this reason more liable to succumb in the struggle for existence, although many species of non-sporing bacilli have such a vast power of multiplication and are so little selective in their requirements that they manage to keep their crops perpetually going; some notorious putrefactive cocci and bacilli belong to this class. I have now mentioned the essential features in the morphology of bacteria, as far as is possible in the limited space of time at my disposal.

*(To be continued.)*

# Provincial Transactions.

## MANCHESTER MICROSCOPICAL SOCIETY.

### PREPARATION OF VEGETABLE TISSUE FOR THE MICROSCOPE.*

BY ABRAHAM FLATTERS.

*(Concluded from Volume XXIII., page 1059.)*

### MOUNTING CELLOIDINISED SECTIONS.

After the sections have been stained with either carmine or logwood, one of two processes may be adopted—1. Clarify the sections by allowing them to stand in oil of bergamot for about one hour, during which time the celloidin will also have cleared, and then mount in balsam or dammar. This is by far the simplest method, but the section becomes very much contracted by being left in the oil of bergamot for such a long time. 2. Mount the section in oil of cloves in the following manner:—Remove the section from the spirit with a lifter and lay it on the slip, taking care to keep it moist all the time with spirit; now place a large drop of oil of cloves on the slip by the side of the section, and having the cover glass ready lower it on to the section and at the same time flush the oil over it. A spring clip should now be placed on the slide with just sufficient pressure to keep the cover in its place. The slide should be laid aside for a few hours, during which time the section will have clarified, the celloidin will have been dissolved out by the action of the oil of cloves, and the tissue prevented from contracting by the slight pressure brought to bear on the cover glass by the clip.

All that now remains to be done is to draw off the oil of cloves with filtering paper, and to run balsam under the cover glass to take its place. The slide may now be dried and finished in the usual way.

### TO STAIN VEGETABLE TISSUE.

In staining vegetable tissue, I wish it to be understood that I make no attempt at describing the numerous methods recommended by some workers, but restrict myself to those I have found useful in my own work. These are three in number only, and perhaps the most important one is that of logwood.

*Logwood Stain (Formula No. 1).*

After the sections have been bleached and washed:—

1. Place them in 70 per cent. alcohol for fifteen minutes.
2. Pour off the alcohol, cover the sections with the stain, and allow them to stand from five to thirty minutes.
3. Pour off the stain and rinse the sections with 92 per cent. alcohol.
4. Pour off the alcohol, pass the sections through oil of cloves, and mount in balsam or dammar.

*Picro-Carmine Stain (Formula No. 2).*

After the sections have been bleached and washed:—

1. Place them in 92 per cent. alcohol for forty-five minutes.
2. Pour off the alcohol, cover the section with the stain, and allow them to stand from forty-five to sixty minutes.
3. Pour off the stain and rinse the sections with alcohol for two or three minutes.
4. Pour off the alcohol, cover the sections with an alcoholic solution of picrate of ammonia, and allow them to stand for one hour. This should be renewed and again allowed to stand for forty-five minutes.
5. Pour off the solution, and rinse the sections quickly with 92 per cent. alcohol.

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* Reprinted, by permission, from the Annual Report of the Society for 1891.

6. Pour off the alcohol, cover the sections with oil of cloves, and when clear mount in balsam.

Rectified spirits and absolute alcohol are sometimes recommended in staining with picro-carmine, but 92 per cent. methylated alcohol answers very well for this purpose.

### *Borax-Carmine and Iodine Green Stain* (*Formula No.* 3).

After the sections have been bleached and washed:—

1. Place them in 70 per cent. alcohol for fifteen minutes.
2. Pour off the alcohol, cover the sections with the stain, and allow them to stand for forty-five minutes.
3. Pour off the stain, and rinse the sections with acid-alcohol, *i.e.*, one drop of hydrochloric acid to ½ oz. alcohol.
4. Pour off the acid-alcohol, and rinse the sections in alcohol two or three times.
5. Pour off the alcohol, cover the sections with an alcoholic solution of iodine green (1 per cent.), and allow to stand for forty-five minutes.
6. Pour off the iodine green, and again rinse the sections in about two changes of alcohol, or until the carmine is clear.
7. Pour off the alcohol, cover the sections with oil of cloves, and when clear mount in balsam.

Borax-carmine is by far the best stain for all botanical purposes, with very few exceptions. The only other stain required, to my mind, is that of logwood. With these two stains and a judicious use of hydrochloric acid nearly every phase of (permanent) staining can be effected.

### To Decolorise and Clarify.

It is sometimes necessary to decolorise tissue for the purpose of showing structure that could not otherwise be seen, viz., fructification of ferns, mosses, capsules, etc. To do this manipulate as follows:—

1. Place the specimen as soon as possible after collecting in 92 per cent. alcohol, and allow it to stand until the chlorophyll, etc., is all extracted.
2. Pour off the alcohol, and place the specimen in water for about thirty minutes to relax.
3. Pour off the water, place in potash solution, and allow to remain until clear.
4. Pour off the potash solution, and cover with water, allow it to stand for about thirty minutes, changing the water two or three times.
5. Pour off the water, cover the specimen with equal parts of alcohol and pure glycerin, and allow it to stand for the alcohol to evaporate. By so doing the glycerin will become concentrated and the tissue permeated ready for mounting in either pure glycerin or glycerin jelly.

If it be desired to mount the object in balsam—

6. Pour off the water as in (5), cover the specimen with 92 per cent. alcohol, and allow to stand until dehydrated.
7. Pour off the alcohol, cover the specimen with oil of cloves, and when clear mount in balsam.

### To Prepare Cuticles, &c.

To prepare cuticles for the purpose of studying the form and structure of the stomata or breathing pores, it is necessary that some method should be adopted by which the cuticle can be removed from the leaf without being in any way damaged. The following method is decidedly good, and it is one that I always adopt:—

The leaf to be operated upon should be cut with a sharp razor into small squares about half an inch, or if the leaf be a very small one, the extreme margin should be cut away. Now place the pieces in a test-tube, with equal parts of nitric acid and water, heat the contents over a spirit lamp to nearly boiling point, and keep at this temperature for two or three minutes. The object of this is to liberate the cuticle from the tissue which lies underneath, and by cutting the leaf into small pieces the acid can more readily enter between them. Now pour the contents of the tube into a dish of water, when the cuticles will generally float, and can be taken out and well washed in water to remove any matter that may still be adhering to them. They may now be placed in 92 per cent. alcohol for about fifteen minutes to dehydrate, when they can be mounted in pure glycerin, with or without staining.

### Formulæ.

#### No. 1. *Hæmatoxylin* (*Kleinenberg*).

(*a*) Make a saturated solution of crystallised calcium chloride in 70 per cent. alcohol, and saturate with alum.

(*b*) Make a saturated solution of alum in 70 per cent. alcohol, and add one part of (*a*) to eight parts of (*b*).

(*c*) To a mixture of (*a*) and (*b*) add a few drops of a saturated solution of hæmatoxylin in absolute alcohol.

#### No. 2. *Picro-Carmine.*

Dissolve 1 grm. of carmine in 24 c.c. of liquid ammonia, ·880, and add 240 c.c. of distilled water.

Dissolve 4 grms. of picric acid in 240 c.c. of 92 per cent. alcohol, and mix the two solutions.

#### No. 3. *Borax Carmine.*

Dissolve by means of heat 2·5 per cent. of carmine in a 4 per cent. aqueous solution of borax, and add an equal portion of 70 per cent. alcohol.

#### No. 4. *Glycerin Jelly.*

Soak 2 oz. of cut gelatin in 13 oz. of camphor water, dissolve by means of heat, clarify with white of egg, filter and add glycerin 16 oz., carbolic acid ¼ oz.

N.B.—For algæ increase the proportion of glycerin.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The second botanical excursion of the season took place on Wednesday, June 14, to Colinton Dell, at 8.30 p.m. The company was again favoured with exceptionally fine weather, and there was an attendance of twenty-three. Among the plants collected were *Alchemilla vulgaris*, *Chrysanthemum leucanthemum*, *Cytisus Scoparius*, *Epilobium montanum*, *Geranium molle*, *Geranium pratense*, *Geum intermedium*, *Geum rivale*, *Lathyrus pratensis*, *Luzula sylvatica*, *Sambucus nigra*, *Spiræa Ulmaria*, *Stachys sylvatica*, *Stachys Betonica*, *Valeriana officinalis*, *Valeriana Pyreniaca*, and *Vicia sepium*.

## Parliamentary and Law Proceedings.

### Medicine Stamp Acts.

On Thursday, in the House of Commons, according to the "Notices of Motion and Orders of the Day," Mr. Gully intended to ask the Chancellor of the Exchequer whether his attention had been called to the operation of the Medicine Stamp Acts, whereby an article labelled mixture for neuralgia is liable to duty, but if labelled neuralgic mixture it escapes duty; and whereby Lamplough's Pyretic Saline is not liable, but if sold to be taken as a dry powder it would be liable to duty; also, whether he would consider the advisability of repealing the Medicine Stamp Acts, at least as regards those preparations which are not protected by patent or by other special rights.

# Reviews and Notices of Books.

## MODERN MICROSCOPY. A HANDBOOK FOR BEGINNERS. By M. I. CROSS and MARTIN J. COLE.*

Though in this book much has been attempted in brief space, the subject matter is dealt with in a very practical fashion throughout. The work is divided into two parts, descriptions of the microscope and its accessories being contributed by the first-named author, together with instructions for their use; whilst his associate, in the second part, has disclosed some of the methods for preparing and mounting microscopic objects which have been productive of such satisfactory results in his skilful hands. It is essentially a beginner's handbook, designed to assist the novice in choosing his instruments and direct him in his early attempts to use them. As such it cannot fail to prove of very great service to students who need to devote their attention to minute structures, and even experienced workers may find an occasional hint of value that may serve to ripen their experience. The descriptions of apparatus are rendered more complete by the use of some thirty illustrations, and the explanations of microscopical technique are clearly and concisely stated, a fair proportion of space being devoted to the important subject of illumination by the aid of condensers. The instructions for preparing tissues, cutting, staining, and mounting sections, etc., if faithfully followed, should not fail to lead to good results, and altogether the pharmaceutical student, in particular, will find here a useful complement to his ordinary text books.

## AN INTRODUCTION TO PRACTICAL BACTERIOLOGY FOR PHYSICIANS, CHEMISTS, AND STUDENTS. By Dr. MIGULA, Lecturer on Botany in the Grand-ducal Technical High School of Karlsruhe. Translated by M. CAMPBELL and Edited by H. J. CAMPBELL, M.D., M.R.C.P.†

Whilst the number of students' text-books of bacteriology increases it will be found that each one possesses some special excellences, and the present work will probably be preferred in many instances to others that have preceded it. The author very properly states that the standard works on the subject are too voluminous to be placed in the hands of beginners, being liable to confuse them from their very fulness of detail. His introduction is devoted to an enumeration of the apparatus necessary for the study, and the student is then at once initiated into the mysteries of bacteriological technique, the method wisely adopted being that according to which the universal prevalence of micro-organisms is first demonstrated. Thus, such readily obtainable materials as carrots, turnips, and potatoes, are utilised for the development of cultures, the slices being exposed in different positions and, after cultivation in moist chambers, the results compared. Care is then taken to explain how to minimise sources of error during examination, after which numerous typical forms of bacteria are described and illustrated, so that at the end of the chapter the student should be capable of appreciating the rough scheme of classification that has been gradually built up. The directions given in this early chapter are perhaps as lucid as written directions well can be. The preparation of nutrient media next occupies attention, sterilisation being dealt with by the way, then cultivations on plates, in tubes, by stroke and puncture, in the hanging drop, and on the slide, are fully and practically explained. Anaërobic bacteria, which must be cultivated in an atmosphere devoid of oxygen, have a special chapter allotted to them, as have also cultivations which require the higher temperature of an incubator. Having thus shown how to obtain material in a fairly or quite pure condition, the other necessary steps in the preparation of specimens are detailed in an equally comprehensible and satisfactory manner, whilst the latter half of the book is devoted to the consideration of pathogenic forms of special interest. The plates are of comparatively little value, and it is to be regretted that photographs could not be inserted, as in the original German edition. This is a defect of mere secondary importance, however, as students should be taught to depend more upon the characteristics of actual specimens than upon illustrations, which, as a rule, show either too little or too much in this department of study, and so hinder rather than facilitate identification. So far as the letterpress goes, and particularly the descriptive portion, it is doubtful if any work has yet appeared which will prove so generally useful to students, especially such as are, to a great extent, dependent upon their own efforts to aquire a knowledge of practical bacteriology, for the minutest practical details are here treated in a most painstaking way. The name of the book is said to have been suggested by Strasburger's 'Practical Botany,' and in a more limited way the book itself will be found as useful and efficient a laboratory companion as that well-known volume.

## ÉTUDES, DISCOURS ET MÉMOIRES RELATIFS À LA PHARMACIE. Par D. A. VAN BASTELAER, Membre l'Académie royale de Médecine de Belgique.*

This is a collection of papers published by the author during recent years and treating of a great variety of subjects of professional interest to pharmacists. Thus we find essays dealing with the sale of specialties; the arrangement of pharmaceutical laboratories; the preparation of antiseptic gauze, wool, and lint; the International Congress at Milan; the laws affecting medicine and pharmacy in Belgium; and many other questions of importance. Taken as a whole the volume should afford a fair idea of the conditions under which pharmacy is conducted in Belgium. It is prefaced by a report of a demonstration in honour of M. Bastelaer, in which the various bodies of Belgian pharmacists took part. On this occasion an address and a portrait of himself were presented to the author in recognition of the services he has rendered to pharmacy.

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* London: Baillière, Tindall & Cox. Pp. i.—xii., 1 to 104. 2s. 6d.

† London: Swan Sonnenschein and Co. Pp. i.-viii., 1 to 247. With nine illustrations in the text and two plates. 6s.

* Brussels: Gustave Deprey, 8vo., Fr. 2.50.

# Correspondence.

### THE MEDICINE STAMP DUTY.

Sir,—It is no doubt the Board's intention not to interfere with the legitimate business of chemists and druggists, but that they do so notwithstanding many chemists will be ready to affirm. Mr. Forret gives two examples of labels showing this. Many others might be added which are no more proprietary in their nature than "Blaud's Pills" or "Easton's Syrup." No doubt, as you indicate in your article, the Board's difficulty is to distinguish between what is proprietary and what is not. The authorities may say, with some reason, "'Smith's Syrup prepared by A. Jones,' printed on a label appears to us to make that label liable to duty, because by the use of the apostrophe, A. Jones, the vendor, 'holds' this syrup out to the public as a proprietary article, and it is no part of our business to investigate whether the receipt for Smith's Syrup is the exclusive property of Mr. Jones, or whether a certain preparation is exclusively prepared by one chemist or by a hundred." But in thus drawing the line at the apostrophe it appears to me that the Board comes to consider many preparations as proprietary which are not proprietary at all. "Jones' Easton's Syrup" would be a proprietary medicine, but "Easton's Syrup prepared by A. Jones" is clearly not. The Board has already made certain concessions for which chemists and druggists are grateful, and if it would further concede that all preparations, the receipts for making which are public property, because published in books which can be purchased by the public, shall not be held to be "liable to duty," it seems to me that this particular grievance would be removed. This concession might also include the right to state on labels of such non-proprietary preparations "all requisite information as to their use" without rendering them liable to duty.

*Edinburgh.* CLAUDE F. HENRY.

### BENEVOLENT FUND ELECTIONS.

Sir,—However much we may disagree with Mr. Hampson's mode of election to the Benevolent Fund, we cannot but admire his perseverance in pegging away at the subject. Woe betide the poor applicant who has no friend at court. Should Mr. Hampson attain his object, the unknown and friendless applicant will stand a very poor chance of ever being elected. If Mr. Hampson wants an example of what a friend at court means let him go back to an election of a few years since, when out of the list selected by the Committee the youngest applicant, and the last to apply, without any exceptional circumstances to recommend him, came out at the top of the poll. I am not implying that it was not a very deserving case, unfortunately they were all so. Some of your readers may be curious to know how this applicant was so fortunate. He had a friend (not the President, nor Mr. Hampson) at court, a liberal supporter of the Fund, and very popular with the Council. Many of them were very pleased to have the opportunity of showing their good feeling by voting for his *protégé*. If such a case can occur under our present democratic mode of election, what may we expect when conducted *in camerâ*. Most of the touting is done by friends of the applicants, who cheerfully spend their money in post cards, but never think of giving to the Fund. There is a sentiment in the average Britisher, it may be vanity or something more contemptible, which you cannot afford to ignore. He likes a vote, and prefers giving it to his chosen applicant, at the same time feels that he is personally doing a good turn to an unfortunate brother. Once you eliminate that sentiment the Benevolent Fund will become a mere advertising medium for wholesalers. I very much regret that such a good all round and deservedly popular man as Mr. Hampson should have, to use a vulgar but expressive term, "gone wrong" on this one point. I believe many members of the Council are opposed to the change, but omit to express their views, probably out of respect to the proposer, which is not fair to their constituents, as they may be misled by not having the views of the different members reported.

*London.* JOHN HICK.

### MECHANICAL STIRRER.

Sir,—No doubt my mechanical stirrer is capable of improvement, even within the limited range for which it was devised. The means of operating it did not at the moment obtrude itself as a very important point relatively to the construction of the stirrer, a description of the latter being the object of my note. Whilst I must ask Mr. Millard to forgive me if I cannot accept his suggestion as tending to improvement, his letter shows the importance pertaining to the subject of it, and a few words thereon will not be out of place or superfluous. Cogwheels are necessary in many stirring operations, as, for example, in mixing the weighty contents of a mash tin, for moving the contents of a sawdust oven in the manufacture of acetic acid, for aniline colour and nitrobenzol stills, for the recovery of alcohol from marc, etc., etc. It will be seen that all these are instances where considerable resistance has to be overcome from the nature of the substance to be moved, and (a) where the stirrer is tightly gripped in a stuffing box. Cogwheels here are not merely superior to gut band and pulley, but are absolutely necessary. With an open evaporating pan the conditions are different, and comparison is entirely in favour of the gut band arrangement. The latter is simpler, lighter, more cleanly, less noisy, and more economical. It is quite equal to any work up to a six-foot pan, and I know of very few pharmaceutical laboratories with a pan so large. For these reasons I abandoned cogs many years ago, and have used gut bands only for open pan work. My present bands have been in constant daily use over five years, and the only attention they have required was within the first month or so, when they needed to be tightened—not half an hour's work each for a handy man. They have never broken, for the reason that they have never been allowed to work with a thick extract. Though the stirrer is extremely useful in a mechanical way, still, it is only mechanical, it is not intelligent, and long before the liquor ceases to flow freely, the pin (C) is withdrawn, the blades raised and held out of the way, and replaced by an intelligent man attached to the handle of a broad, thick paddle, with instructions to make vigorously figures of 8 and round O's from centre to circumference of the thickening mass. I should be glad to know a better way of beating out the steam. It will be seen that the resistance is small, it has not yet broken a gut band or stopped the small special motor with a few lbs. of steam behind it. Mr. Millard's experience with a 20 horse-power engine is remarkable and noteworthy. One knows not which to admire most, the strength of that liquor or the tenacity of those paddles. Or, had the steam gone down?

*Deptford, S.E.* JOHN MOSS.

*F. P.*—1. *Agrostis alba;* 2. *Catabrosa aquatica;* 3. *Juncus bufonius;* 4. *Stellarix glauca;* 5. *Juncus supinus;* 6. *Carex ovalis.*

## NOTICES OF MEETINGS NEXT WEEK.

SATURDAY, JULY 8.

*School of Pharmacy Students' Association.*
Botanical Excursion to Hadleigh Woods. Leave King's Cross (G. N. Ry.) at 2.15 p.m.

*Pharmaceutical Cricket Club v.* Cheam Common. At Worcester Park, Sutton, at 12 a.m.

## BOOKS, PAMPHLETS, ETC., RECEIVED.

CATALOGUE OF THE EXHIBITIONS OF E. MERCK, DARMSTADT, AT THE WORLD'S COLUMBIAN EXPOSITION. I. Special Exhibition, in "Merck's Building;" II. Collective Exhibition, in the German Section. Chicago, 1893. From the Publisher.

WHAT TO DO IN CASES OF POISONING. By WILLIAM MURRELL, M.D., F.R C.P. Seventh Edition. London: H. K. Lewis. Royal 32mo., pp. 276. 3*s*. 6*d*. From the Publisher.

TRANSACTIONS AND ANNUAL REPORT OF THE MANCHESTER MICROSCOPICAL SOCIETY FOR 1892. Manchester: Published by the Society. Pp. 114. 2*s*. From the Honorary Secretary.

**COMMUNICATIONS, LETTERS, etc., received from Messrs.** Bolton, Hill, Reynolds, Stewart, Thompson.

## SOME NOTES ON ECONOMIC BOTANY.

BY J. G. PREBBLE, BOMBAY.

*Illicium religiosum*, Sieb. et Zucc.—My attention was recently directed to this subject by a case of poisoning and death from eating the fruits or seeds. At about six o'clock in the evening a Hindu female child, aged four years, shortly after eating the seeds was seized with vomiting and convulsions. The mother removed the child to the Jamsetjie Jeejeebhoy Hospital, the largest general hospital in Bombay and to which the medical school is attached, for treatment. After admission the convulsions increased in rapid succession, and continued more or less throughout the night; the patient became very restless and prostrate, was eventually unconscious, and died at 8.40 a.m. From inquiries personally made from the friends of the deceased, I found that the seeds eaten were, as I suspected, those of *I. religiosum*. Star-anise fruits are called by the natives in Bombay, Bádián; on asking for this at several native druggists' shops I was invariably shown the fruits of *I. religiosum*, the true star-anise fruits not being kept in stock. Further enquiries made of the native importers elicited the fact that no true star-anise was now imported into Bombay, and had not been for four or five years past. One of the largest native dealers, with branch houses in Calcutta and Singapore, informed me that true star-anise was now hardly obtainable either in Bombay or Calcutta, and that it was all sent direct from Singapore to Europe. The star-anise fruits sold in Madras[*] and imported from Calcutta are also, judging from the price, five rupees per maund, the poisonous species. True star-anise is quoted in Bombay as worth about twenty rupees a maund and the false species five rupees; formerly the latter was worth only two rupees a maund. Although I have made many attempts I have been unable to obtain a sample of genuine star-anise in Bombay. Large quantities of these fruits are imported, and are used for mixing with other spices for flavouring food. The natives do not know of their poisonous property, and this is probably due to the quantity employed, the star-anise being, as a rule, only one of a number of spices mixed together. In Mr. Holmes' excellent paper on star-anise[†] he says, "Although only the Chinese and Japanese star-anise have occurred in English commerce, there are two other kinds which appear to be articles of trade in the East." I made particular inquiries for other kinds, but only one is now imported, and the dealers appear to know of only two kinds,[‡] the true, *I. verum*, Hook. f., and the false, *I. religiosum*, Sieb. et Zucc.

*Pistacia Terebinthus*, Linn.—The leaves of this tree have recently been imported into Bombay from the Persian Gulf for tanning purposes. A consignment was seized by the Customs authorities, who mistook the leaves for those of Indian hemp, which is subject to rigorous excise restrictions. The galls formed on the leaves have also been imported of late years.[§] Aitchison[‖] says, "The leaves almost without exception are affected by a flat horse-shoe shaped gall that extends round the margin of the leaf. This gall is so very distinct in form, much resembling the lobe of the ear, that the leaves get their name *gōshwāra*, meaning ear-like, owing to this resemblance. By these galls alone the leaves of this species may be identified from those of *Pistacia vera*. These galls, the natives say, are of no use, but the leaves are valued for dyeing and tanning with."

*Actinodaphne Hookeri*, Meissn. *Vernacular*, Pisa. —This small tree, common on the Western Ghâts and some other parts of India, yields at the commencement of the hot season a superabundance of saccharine sap that is often forced through the bark of branches as a fine shower or rain, covering the leaves, twigs, etc., on the ground beneath with a syrupy layer that gives them a varnished appearance. The excessive amount of saccharine sap that this tree yields during the hot season suggests that it might furnish a possible source of sugar, as is the case with the sugar maple in America. Dr. Watt, writing of the genus *Acer*, says,[*] "If they were found to take naturally to the soil and climate of Indian sub-Alpine regions, they might supply the poor hill tribes with the little-known luxury of sugar." If attention were given to the systematic tapping of this tree it would probably yield abundance of crude sugar.

*Salix tetrasperma*, Roxb.—At the commencement of the hot season, when tropical trees are at their maximum of physiological activity, the upper surface of the leaves of this tree are occasionally covered with a syrupy exudation, which dries up in thin white flakes to a sugar or manna. The same trees often yield this exudation several years in succession, but it appears to be confined to a few trees, and is not common. Those from which I gathered it were growing on a laterite soil at an elevation of 4300 feet at Mahableshwar in the Western Ghâts. I could not make out whether the exudation was caused by the punctures of insects or otherwise, but a microscopical examination of the leaves would probably show this. Two or three other species of *Salix* have also been observed to yield a saccharine exudation; *Salix fragilis* in Persia, *S. Chilensis* in Chili, and *Salix sp.* in the Punjab. The exudation from this species was very soluble in water, about one in two, yielded a slight precipitate with acetate of lead, and melted at about 150° C. Assayed with Fehling's solution it afforded 10 per cent. of a reducing sugar. M. Raby[†] analysed a sample of manna said to be derived from the leaves and young branches of a willow found in Persia, which appears to closely resemble the exudation under notice.

*Uncaria Gambier*, Roxb.—For some time past there has been imported into Bombay from Singapore a sophisticated gambier in free cubes containing a large percentage of starch. This adulterated gambier has a cleaner and better looking appearance than the genuine drug, the cubes are more regular and not broken or fused at the edges, and the colour is of a uniform dark cinnamon brown externally, paler on the inside. The cubes weigh on an average 8·33 grammes, and measure 19×26×21 millimetres; they float on water, and taste

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[*] Mohideen Sheriff, 'Mat. Med. of Madras,' vol. 1, p. 7.

[†] *Pharm. Journ.*, [3], vol. xi., p. 489.

[‡] According to the 'Pharmacographia Indica' an Indian species, *I. Griffithi*, is occasionally met with.

[§] 'Pharmacographia Indica,' vol. i., p. 378.

[‖] Aitchison, 'Notes on the Products of Western Afghanistan and of North-Eastern Persia,' p. 155.

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[*] Watt, 'Dictionary of the Economic Products of India,' vol. i., p. 67.

[†] Hooper, 'Chemical Notes on Mannas,' *Pharm. Journ.*, [3], vol. xxi., p. 421.

like true gambier. Exhausted with ether it yielded only 26 per cent. of soluble matter, while genuine gambier yields at least half its weight to this solvent. On incineration it left 6·8 per cent. of ash.

In an interesting paper on gambier, by P. MacEwan,[*] it is stated, on the authority of Mr. Jamie, "That a very light clay or earth (which is eaten by the natives) is used for adulterating gambier, and that adulteration with starch is rarely or never resorted to." No starch was detected in several samples examined by MacEwan. On the other hand, a good authority says[†] "The best kind is brought largely from Sumatra, and is often adulterated with sago. The Rhio product is also thus sophisticated." And, further, Allen[‡] writes, "*Starch*, sand, clay, and blood" are not infrequently used. Under the microscope no regular crystals are observed in this extract, and the acicular crystals characteristic of true gambier are not met with, but a fine granular mass of starch which does not polarise, having been altered or broken up by the heat employed in making the extract.

*East Indian Gums.*—Last year Dr. Rideal read a paper on "Some Indian Gum Samples of Known Origin"[§] before the Society of Chemical Industry. As I have paid some attention to the study of Indian gums, and have resided for several years in Bombay, the chief place of export, and have further frequently made large purchases of gum both for local use and for export for the firm with which I am connected, Messrs. Kemp and Co., I take the liberty of offering some remarks on his paper. Dr. Rideal reiterates the worn out statement that the bulk of the gum exported from Bombay is of African origin. He says, "The gum exported from Bombay to Europe is chiefly obtained from the Red Sea ports, and it is more or less adulterated with the Indian product." This statement was probably correct years ago, but for several years past the exports of gums of Indian production have far exceeded those imported from African ports, and since 1885 a separate entry has been made in the official trade returns for both classes of gum. The official statistics[‖] for the last five years are as follows:—

Foreign gums imported into Bombay.

| 1887-88. | 1888-89. | 1889-90. | 1890-91. | 1891-92. |
|---|---|---|---|---|
| cwt. | cwt. | cwt. | cwt. | cwt. |
| 2132 | 12,954 | 8363 | 6505 | 5245. |

This gum is not all exported again, some being used in India.

Indian gums exported from Bombay.

| 1887-88. | 1888-89. | 1889-90. | 1890-91. | 1891-92. |
|---|---|---|---|---|
| cwt. | cwt. | cwt. | cwt. | cwt. |
| 31,826 | 55,192 | 33,209 | 31,327 | 33,614 |

The gums imported from Africa are usually sold as such, and not mixed with other gums. They can generally be recognised by an expert from Indian gums, being of a different shade of colour, often with a pinkish hue. "Bombay Pink" and "Aden Pink" are suggestive terms applied to this class of gum in the Mincing Lane market reports.

With regard to Sind gums, Dr. Rideal says, "The indigenous product is merely used for home consumption in the interior of the country, the requirements of the seaport districts being met by the imported gum; very little of it finds its way to the seaport for export." This statement is also incorrect, and is further disproved by the official trade returns,[*] which are as follows:—

Foreign gums imported into Sind.

| 1887-88. | 1888-89. | 1889-90. | 1890-91. | 1891-92. |
|---|---|---|---|---|
| cwt. | cwt. | cwt. | cwt. | cwt. |
| 52 | 30 | 274 | —— | —— |

Gums of Indian production exported.

| 1887-88. | 1888-89. | 1889-90. | 1890-91. | 1891-92. |
|---|---|---|---|---|
| cwt. | cwt. | cwt. | cwt. | cwt. |
| 4458 | 5311 | 3939 | 2970 | 4108 |

Sind gum is exported from its only important port, Karachi, and is known in the London market as Karachi gum. Locally this gum, or a portion of it, is called Oomarkote gum, from Oomarkote, a small town on the confines of the Sind-Rajputana or Great Indian Desert, which is a first entrepot for the collection of the gum, just as El Obeid is or was one of the first centres for the collection of Kordofan gum. Oomarkote gum is most probably entirely the produce of *Acacia Senegal.* Only a very few plants grow in this desert region, and *Acacia Senegal* is one of the commonest. The physical conditions of Sind closely approximate to the gum-producing districts of Africa, and, as is well known to botanists, nine-tenths of the Sind flora are indigenous to Africa. Extensive forests of *Acacia arabica* occur in Lower and Central Sind, and this tree doubtless furnishes some of the gum exported from Karachi.

*Acacia Farnesiana*, Willd.—I notice that Dr. Rideal describes the gum from this source as soluble, and the Pharmacopœia of India says "The gum yielded by *A. Farnesiana* and *A. Lebbek* is said to be of a superior quality." One or two other writers also describe it as a substitute for gum arabic. The gum collected by myself from trees growing in the neighbourhood of Bombay at first dissolves, but on standing a short time it gelatinises, and on adding more water a thick gelatinous fluid is formed. Thinking that the heavy rainfall and perennially moist climate of the Concan might affect the character of the gum, when an opportunity occurred, I gathered some from a tree at Poona, in the Deccan, where there is a moderate rainfall, and a hot, dry climate during the greater part of the year, but this gum also behaved in a similar manner, and I have on several occasions collected the gum from different trees, but always with the same result.[†] The black or brownish turgid legume of *A. Farnesiana* distinguishes this species from all other Indian allied plants.

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## TRAPA BISPINOSA, L.

### THE INDIAN WATER CHESTNUT.

BY DAVID HOOPER.

The Trapas are water plants growing in canals and shallow lakes in Eastern countries, and belonging to the natural order Onagraceæ. *Trapa natans* is the European species yielding the "Jesuits' nut" of Venice. *T. bicornis* is the Chinese species, and affords the "ling"[*] of that country, which is largely used as an article of diet. *T. bispinosa* belongs to Northern India, and is extensively cultivated in Guzerat, Kashmir and the North-Western Provinces. The Trapas have long been known in medical history. It is now generally accepted that the *τρίβολος* of Dioscorides was the same as the Tribulus of Pliny, and that there were two kinds of this plant, the terrestrial and aquatic. The terrestrial is now referred to *Tribulus terrestris* and the aquatic to *Trapa natans*.

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[*] *Pharm. Journ.*, [3], vol. xv., p. 793.

[†] Spon's 'Encyclopædia of the Industrial Arts,' vol. ii., p. 1985.

[‡] Allen, 'Commercial Organic Analysis,' vol. iii., pt. i., p. 104.

[§] *Journ. of the Soc. of Chemical Industry*, May, 1892.

[‖] Annual statement of the trade and navigation of the Port of Bombay.

[*] Annual statement of the trade and navigation of the Province of Sind.

[†] See also 'Pharmacographia Indica,' vol. ii., p. 550.

The vernacular names of the Indian water chestnut are *Singhara*, *Paniphul* (Hindustani), *Cingada* (Marathi), and *Karimpola* (Malyalum). Dr. Sleeman writes:[†] "The Singhara, in the N. W. Provinces, is everywhere as regularly planted and cultivated in fields under a large surface of water as wheat or barley is on the dry plains. It is cultivated by a class of men called Dheemurs, who are everywhere fishermen and palankeen bearers; and they keep boats for the planting, weeding, and gathering the Singhara. The holdings or tenements of each cultivator are marked out carefully on the surface of the water by long bamboos stuck up in it; and they pay so much the acre for the portion they till. The long straws of the plants reach up to the surface of the water, upon which float their green leaves; and their pure white flowers expand beautifully among them in the latter part of the afternoon. The nut grows under the water after the flowers decay, and is of a triangular shape, and covered with a tough brown integument adhering strongly to the kernel, which is white, esculent, and of a fine cartilaginous texture." The nuts ripen at the end of the rains in September, and afford food for the natives for about four months in the year. The celebrated Runjit Singh, of Lahore, derived an income of £12,000 per annum from the cultivation of these nuts, and they are still a considerable source of revenue to Government.

Singhara is sold at 3 annas a pound; the outer coating is removed, and the white kernel is roasted and pounded to a flour. It is largely used as a food in the season, and is considered cooling in bilious affections with diarrhœa. It is a nutritive tonic for invalids, and is preferred by some to tapioca and sago. The stalks and integuments of the fruits of Singhara contain a red colouring matter, which the natives are in the habit of throwing over one another during the Holi festival, and sometimes use as a dye. The colour, however, is not very permanent.

Some of the fruits were obtained by me in Mussoorie this year. The outer red-brown coats were removed, and the white kernels were sliced and dried in the sun. The powdered nuts had a white colour, a sourish odour, and no distinct taste. The starch, observed under a microscope, consisted of oval, oval-oblong, and elliptic granules; there had been no pressure to form angular outlines.

An analysis of the powdered kernels showed the following composition:—

| | |
|---|---|
| Fat | ·97 |
| Sugar and gum | 14·36 |
| Albuminous matter | 8·41 |
| Starch | 63·84 |
| Cellulose | 3·60 |
| Ash | 4·66 |
| Water | 4·16 |
| | 100·00 |
| Nitrogen | 1·33 |

The nutrient-ratio, or the ratio between the albuminous matter and the starchy materials, is 1:9·5, and the nutrient-value 80·4. This result shows that the Indian water chestnut is allied to the cereals as a food, and is a little better than cleaned rice, which has a nutrient-ratio of 1:10·8.

One of the interesting points with regard to the Trapas is the capabilities of these plants for taking up manganese. Gorup-Besanez,[*] in 1861, analysed the whole plant of *Trapa natans* in June, and found 1·61 per cent. of manganese oxide, and in May 1·68 per cent., and the fruit itself yielded 0·74 per cent. Flückiger drew attention to this fact in a paper[†] on the distribution of manganese in plants, and later[‡] recorded the discovery of manganese in the *T. bicornis* fruits of China. I have tested the ash of the Indian species and have found manganese in both the pericarp and kernel. The 4·66 per cent. of ash in the edible portion contained only a very small quantity of this metal, but the pericarp yielded a reddish coloured ash which was very rich in manganese. In obtaining evidence of the presence of manganese in the ash I found Crum's test work most satisfactorily, on account of the absence of much soluble alkaline chlorides.

## THE PHARMACIST.—HIS GENERAL RELATION TO SOCIETY.

BY CHARLES H. SCOVILLE.

The pharmacist occupies a position in the business and social framework of society scarcely less important and responsible than that of the physician. While it is not within his province to diagnose the disease or decide what remedy shall be used, he is required, under the direction of the physician, to prepare various remedies. The more knowledge he can have of the quality and effect of these remedies, the better he will be able to insure the correctness of his work. Drugs and chemicals, to be used as medicines and taken into the human system, must be handled with the greatest care and accuracy. A good pharmacist should have a thorough knowledge of the properties of each substance that enters into the prescription, and its general effects upon the physical system, so as to be something more than a mechanical agent in doing his work. With that knowledge he may often assist the physician, besides being secure against committing any error that might seriously endanger health or life. The public demands (and that justly) that he shall attain to this standard of knowledge before he attempts to serve in this professional capacity. It is simply his duty to satisfy that demand, notwithstanding it may cost years of close attention and careful study.

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[*] Figured in 'Science Papers,' p. 241.

[†] Dr. Sleeman's Journal, in 'Useful Plants of India,' p. 430.

[*] Watt's 'Dict. Chem.,' vol. v., p. 878.

[†] *Pharm. Journ.*, [3], iii., 206.

[‡] *Pharm. Journ.*, [3], xvi., 621.

The pharmacist must be a man of strict and personal honour. He must keep all knowledge which he is instructed with in the performance of his work, relating to the character, habits, or condition of his customer, sacredly concealed within his own breast. Many persons who seek his services have ailments of a delicate character, which are known only to those who are asked to prescribe or prepare relief. The prescription presented tells often as plain as words the character of the sufferer's complaints; professional honour demands that the pharmacist, no less than the physician, should keep all these matters strictly guarded from the ear and tongue of the public. He must be diligent in the performance of his work and ever at his post of duty. It is his business to prepare medicines for the sick, consequently his services may be needed at any moment. Let him so perform his work that it will give the greatest benefit to suffering humanity, besides promoting in the highest degree his own business welfare.

He should make it his special aim to keep abreast of the times, in the acquirement of new and useful knowledge in his profession, labouring not only for himself but for the common cause of pharmaceutical science. Let him subscribe for and carefully read the best journals or papers devoted to the cause. Let him attend the meetings of the pharmaceutical associations of the town, county, or state to which he belongs, for it is there that mind meets mind, intellect is sharpened by intellect, and new ideas are advanced, discussed, and utilised to the benefit of all. If at any time he is prevented by private duties, obligations, or business from so doing, let him at least send a word of suggestion or cheer to his brothers who do assemble, showing that he aims to be an active worker in his profession and a live member of the society. He will thus assist, though in a humble way, to keep up the spirit and framework of the association. This is a matter of much importance, for such organisations, rightly conducted, will unite the labour and strength of the profession, and not only enable it to work better for society, but to command the respect and secure the rights which are due to its members as a distinct class of workers in the community, having rights peculiar to themselves.—*Pharmaceutical Era.*

## OPIUM TRADE OF CHINA.

### CHINKIANG.

The import of opium in 1892 shows a steady and almost uninterrupted decrease, being less than half of that in 1887, when the new rules enforcing the provisions of the additional articles to the Chefoo Agreement were introduced, and about one-fourth of what it was in 1883. As the dry season had been disastrous to the native crop, a larger import might have been looked for, but the low figures are perhaps partly due to the distress prevalent in the province, and partly to an increased import to the neighbouring port of Wuhu. Recent action of the customs in preventing opium, adulterated at Chinkiang, from being taken inland under foreign opium certificates, was prophesied to be likely to affect seriously the importation of Indian opium; but as the adulterated article must have, to some extent, supplanted the genuine drug, there appears good reason for believing that the opposite result may be looked for. At present the only visible effect produced is that a few small opium dealers have left Chinkiang.—*Consular Report*, 1228.

### NEWCHWANG.

The trade in opium continues to dwindle. This year's import of Indian opium, almost all Malwa, is 17,413 lbs., value £12,176. It is little more than half that of the preceding year; but in comparison with earlier years the decrease is not so rapid. Three chests of Persian opium passed through the custom-house. There is, of course, a good deal of native opium smoked in Newchwang and in the rest of Manchuria; but what may be the production and consumption throughout the three provinces there are no statistics which would enable one to make even a tolerable guess. The proportion of smokers to population, however, is certainly less than in southern and central China. No native opium leaves the port through the foreign custom-house; nor apparently do the attempts of the officials to tax it in the interior meet with any noteworthy success.—*Consular Report*, 1229.

### CHUNGKING.

Native opium furnished a full quarter of the revenue of the Imperial Maritime Customs at Chungking. Of the total, 12,329 lbs. are returned as Yünnan drug (which, however, is said to be often mixed with Szechuen at Suifu (Hsü-chou Fu), the great port of entry), and 332,490 lbs. as Szechuen. The latter all comes up from Fu-chou and Fêng-tu, the chief river centres of export, about 100 miles and 150 miles by water respectively, below Chungking. The export of opium from this province (Szechuen) has been variously estimated. From the careful inquiry of Mr. A. E. von Rosthorn, of the Imperial Maritime Customs, it now seems fairly certain that the annual export cannot exceed 5,250,000 lbs. The small fraction even of this, the lowest estimate, that passes through the Imperial Maritime customs is destined for export by steamer from Hankow and Shanghai, as the "likin" levied by each province soon brings the total tax payment above the customs' charges. This year's total is not likely to be exceeded in the future, even should the sharing of the whole duty between Szechuen and Hukwang not lead to extra taxes being imposed on the drug at its destination. The great bulk of the export goes either overland from Fu-chou to Kwangtung, Kwangsi, and Kiangsi, or by land or water from Chungchou, Fêng-tu, Wan Hsien, and other river towns to Shashih. The last crop was reported inferior in Szechuen as a whole, though the east of the province certainly did well, fair in Yünnan,* and moderate in K'ueichow. Shensi, which twenty years ago supplied Chungking, has utterly dropped out of the market. The retail price in this city had advanced at the end of the year from 150 cash to 200 cash per tael (say from 4*s*. 7d. to 6*s*. 1*d*. per lb.) for Szechuen and K'ueichow drug, and to 260 cash from 200 cash (say to 7*s*. 11*d*. from 6*s*. 1*d*.

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* Much of the opium exported from Yünnan is taken to Kwangtung to be mixed with the Indian drug, and a good deal also goes to Hunan.

per lb.) for Yünnan opium, which is the sort most esteemed here. These prices include a "likin" of 5 cash per tael (1¼⅜*d.* per lb.) levied on all opium entering Chungking. in which the shops, the number of which is now and then forbidden to be increased, are said to number at present 928, to a population probably little over 200,000. In September the Superintendent of Trade issued a proclamation urging the people to grow cereals instead of opium. It is still on the walls, within sight of which flourishing fields of the poppy bear witness to its futility. It has been suggested that opium cultivation has driven out cotton, and that, were opium forbidden, Szechuen would grow its own cotton. My inquiries fail to find any facts for this theory to rest on. What opium has displaced are beans, winter wheat, and especially rape. And it is unlikely that cereals will be grown in place of opium so long as the latter crop yields a profit which, in this neighbourhood at least, exceeds that on wheat by some 80 per cent.—*Consular Report*, 1230.

### HANKOW.

There has been an increase in the import of opium by about 1200 lbs. over 1891. This is a mere fluctuation of the trade, and does not promise any further increase in the future. Besides, it has not all passed into consumption, but part of it is kept in bond at the customs.—*Consular Report*, 1231.

### NINGPO.

The total importations of this drug reached 6226 piculs, being an advance of 154 piculs over the figures of the previous year. More than 90 per cent. of the whole consisted of Malwa, which shows a slight increase, whilst Patna and Benares continue steadily to lose ground. This does not indicate any actual diminution in the demand, but is explained by the fact that these two varieties are consumed chiefly in the extreme north of the province, in the prefectures of Chia Hsing and Hu Chow, on the borders of Kiangsu, which, since 1887, have been enabled to draw their supplies more conveniently from Shanghai direct. In fact, the opium trade of this port would be considerably less, and that of Shanghai correspondingly greater, were it not for the allowance of 3·80 taels per picul which has been made since 1888 to the dealers on all opium imported by them, the dealers in return guaranteeing the import of not less than 5000 chests per annum. The anticipations that this rebate would bring the whole trade back to Ningpo have not yet been altogether realised, as is shown by the following figures:—

*Average Net Import.*

| | Number of Chests per Annum. |
|---|---|
| 1880–86 | 8034 |
| 1887 | 4389 |
| 1888 | 6041 |
| 1889 | 5932 |
| 1890 | 6026 |
| 1891 | 6027 |
| 1892 | 6198 |

Sixty-five piculs of Persian opium were imported in 1892 against seventeen piculs in the previous year, and an average consumption for several years past not exceeding six to seven chests per annum. This large increase is ascribed to the failure of the native crop, and the consequent use of Persian as the cheapest available substitute. Native opium also figures as an import in this year's return, 18·78 piculs of Ssu-chuan or Yünnan drug having found their way here from river ports. It fetched 330 taels per picul, whilst Chekiang opium, grown in the Taichow and Hsiangshan districts, to the south of Ningpo, was sold at 160 taels per picul for new and 200 taels to 220 taels for old. The local crop was, however, a failure, owing to the prolonged drought in the early part of the year.—*Consular Report*, 1235.

## RUBBER IN SIERRA LEONE.

BY G. F. SCOTT ELLIOT.

The rubber exported from West Africa is of two kinds. One is derived from the so-called rubber-vines, which appear to be all species of *Landolphia* or *Carpodinus*; the other is derived from a tree, *Ficus Vogelii*, and possibly also from other species of fig. The most important kinds in the district through which we passed, "Oro," "Djengé," "Furé," and "Genyé" (all rubber-vines), were found in old forest, and the amount existing at present cannot be large. The natives have long since cleared the land of the original primeval forest in all the parts below 1,000 feet, and the country is either under cultivation for cassada or is covered by grass or bush from three to ten or twelve years old. The natives seem in most districts usually to make a fresh clearing after the bush has attained this age, and consequently these kinds of rubber do not get a chance of growing, as they all, so far as I have seen personally, prefer old forest where the trees are at least twenty years old, and the soil consists of a rich, moist humus, or is, at any rate, a mixture of leaf mould and other soils. On the other hand, on the plateaux of iron pan and gneiss from 1,000 feet upwards to 3,000 feet, the trees, though numerous and in large part of considerable age, are too isolated, and the soil is too dry and hard for these rubbers. In fact, the amount of rubber available from the rubber-vines depends on the amount of original forest, and this is not large in the district we traversed.

On the other hand, there are enormous areas from which rubber could be obtained, provided the district was freed from the never ceasing native wars and slave-raiding expeditions. Thus the country about Laya and Kofiu mountain, as well as the Benna country, along the edge of which we passed, is full of forests and contains much rubber which would, if the roads to Kambia were safe, pass down the Scarcies River. The Fula country, lying back from the northwest corner of the English sphere of influence, is also said to be full of rubber, which would most probably come down the same way. Along the tenth degree of north latitude the country is in many places broken and mountainous, and the deeper and narrower valleys are full of dense forest, from which the rubber could be profitably withdrawn. There is also in all probability an enormous supply in the almost uninhabited Koronko district, and in the magnificent woody valleys about Bafodeya and other parts of the Limba country, on the Upper Rokelle and especially in the back country of Sherboro. I should think it probable that with roads made absolutely safe, the supply of rubber from the colony might be doubled, or even quadrupled in amount, but with the development of lawlessness, and the constant native wars everywhere, but little is to be expected after the next few years, when the sources readily reached from the coast have been drained of their supplies. It must also be remembered that the supply is one which is likely to be exhausted with increase of population and ought not to be reckoned upon for more than a few years, supposing the country were rendered safe.

This, however, only applies to the above-mentioned kinds, and does not affect the supply derived from *Landolphia florida*, and the other species of *Carpodinus*. These latter plants were found in fairly open dry ground, at from 1,000 to 3,500 feet, and are probably very abundant everywhere. The rubber yielded by them is neither so good nor so abundant as that from the above-mentioned kinds, though probably it could be immensely improved by better means of extraction. With regard to the rubber from trees, I only found *Ficus Vogelii* once in the Niger drainage area; this is the kind found at Bassa and lower down the coast. There are about thirty-nine specimens of *Ficus* sorts in my collection, and it is of course possible that several of these yield rubber, but the only other species of which I heard this is a new species. On the whole the supply existing in the country we traversed cannot be considered as of great importance. —*Colonial Report*.

## MANGROVES IN SIERRA LEONE.

BY G. F. SCOTT ELLIOT.

The effect of the mangroves could be very clearly seen at Mahela and the Samu country generally, and requires a little explanation. The trees seem, in fact, to have been designed by Nature to change any bay or indentation of the coast line into fertile soil. Thus the whole of the country from Mahela to Rokon, and round from Digipali to Kitchom seems to have been at one time a wide bay or arm of the sea, in which sand and mudbanks accumulated through the action of the tides and currents. Wherever such a mudbank is in process of formation, the mangroves grow upon it, gradually advancing seawards as the silt accumulates. They require brackish water, and their mode of growth is thoroughly adapted to this habit. The trunk divides at the base into six or seven curved buttress-like roots, each of which subdivides repeatedly, so that it covers a wide area with curved grasping supports. This is, however, but the first stage of growth. After a very short time, long hanging roots are sent down vertically from every branch of the tree, and, about the level of high tide, each of these pendent roots divides into five or six grasping fingers, which grow down into the water and root themselves so firmly in the silt, that they cannot be torn up by any ordinary force of current. As each branch of every mangrove acts in this way, the soil becomes pierced by roots in every direction, so much so, that where the natives have made a clearance for rice growing, the numerous standing roots in the ground seem like a harrow with the points turned upwards. Hence the leaves of the mangroves and all the silt and soil in the water are held by this meshwork of roots and rootlets, and the accumulation of soil advances rapidly. As the level of the ground (through this accumulation) rises above high tide, the mangroves, which require a constant supply of brackish water, die off and the whole grove advances seaward, leaving behind it a mass of rich vegetable alluvial mud, better suited for rice than probably any other soil in existence. In mapping out the windings of the Mahela creek, we constantly saw how the mangroves were blocking up the channels, and no doubt in course of time the whole creek will become solid land.—*Colonial Report*.

## CONSUMPTION OF GANJA IN INDIA.

Some time ago Mr. Mark Stewart called attention in the House of Commons to the use of "ganja," or Indian hemp, in India, suggesting that it was more harmful than opium, and that the lunatic asylums of India were filled with ganja smokers. Referring to the fact that the possession and sale of the drug were prohibited in Lower Burma, he asked whether the same prohibition could not be extended to the other provinces of British India. Inquiries on the subject were addressed to the Government of India and, in reply, it was acknowledged that there was no doubt the habitual use of the preparation does tend to produce insanity, and that it is the most noxious of all intoxicants now commonly used in India. If, however, an absolute prohibition of the use of the drug could be enforced, the result might be to induce the use of still more noxious drugs, since India abounds with plants, growing wild, which yield products more deleterious in their effects than ganja. Thus, the seeds of stramonium are sometimes used to intensify the narcotic effect of "bhang," a liquid preparation of hemp leaves, and if the use of ganja were totally suppressed these seeds might be largely resorted to by the poorer classes as a means of satisfying their craving for stimulants. But, apart from this, it would be next to impossible to enforce in India a prohibition of the use of ganja, as the plant grows readily, without cultivation, in so many parts of the country, and anyone addicted to its use could easily grow a plant or two in the enclosure of his own house, where it would be free from observation and from the risk of detection. The analogy of Burma, moreover, does not apply to India, for in the former district the drug was very little used before the prohibition was enforced, whilst consumers were dependent on importations for their supplies. The whole matter has since been dealt with in a Blue Book recently published. This contains full details of the cultivation and use of ganja and other noxious drugs in India, and copies of all the official correspondence on the matter, including a despatch from the Secretary of State for India to the Governor General of India in Council, in which he states that he concurs in the view expressed as to the undesirability of attempting to enforce a general prohibition of the use of the drug.

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JULY 8, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the meeting of the Council last Wednesday the President announced that the Vice-President was unable to be present on that occasion, owing to the death of a relative. The accessions to the Society included two chemist and druggist members, ten associates, and twelve students. The reelection of Mr. James Laidlaw Ewing as Chairman of the Executive of the North British Branch of the Society, and that of Mr. C. Kerr as Vice-Chairman for the ensuing year were communicated to the Council.

The report of the Finance Committee recommended that two thousand pounds should be placed on deposit account, but otherwise presented no point of special interest.

On the recommendation of the Benevolent Fund Committee two grants of fifteen pounds each and one of ten pounds were ordered to be paid. The death of Mrs. Mumbray, an annuitant since 1891, was announced. Mr. Hampson, acting as Chairman of the Committee in the absence of Mr. Cross, expressed his satisfaction that the orphan daughter of Mrs. Minett had been successful as a candidate for election to the London Orphan Asylum, and he hoped it would not be forgotten that another child would be a candidate for election to the Infant Orphan Asylum at Wanstead in November next. Attention was also directed to the desirability of having, in connection with the Orphan Fund, a sum of money at the disposal of the Committee to apply whenever occasion may arise.

The report of the Library, etc., Committee gave the usual statements as to the attendances at and donations to the Society's Libraries and Museums in London and Edinburgh, and also as to the reports made by the Staff of the Society's School, but the President mentioned that a very large and valuable donation of specimens of essential oils recently received from Messrs. Schimmel, of Leipzig, called for special notice, and he therefore desired, on behalf of the Council, to thank the donors for the magnificent collection they have presented to the Society's Museum.

Among other matters dealt with in this report were the suggestions made by the Executive of the North British Branch in regard to the appointment of additional local secretaries and assistant local secretaries in Scotland. On the recommendation of the Committee these suggestions were adopted, and a considerable addition will now be made to the number of the Society's officers in Scotland. The President, in moving the adoption of the report, expressed a hope that by this means the desire of Scottish members to awaken greater interest in the Society would be realised, and that the new officers would be able to encourage members of the trade to join the Society in larger numbers. Mr. Storrar, in supporting the motion, pointed out the necessity for extended organisation, in the way proposed, for the purpose of taking advantage of the increased loyalty to the Society, which does not always translate itself into membership without the assistance of such personal influence as can be exercised by active local secretaries, and he hoped the result of the new appointments would be a large increase in the membership in Scotland.

Another recommendation of the Committee was that a professorship of materia medica should be established in connection with the Society's School. This was adopted, as well as the further recommendation that Mr. H. G. Greenish should be appointed to the chair. The President and Mr. Schacht made highly complimentary references to Mr. Greenish's qualifications for the position and to the great success with which he has, during the last two years, conducted the demonstrations in materia medica, as furnishing reasons for satisfaction that his services as professor may be secured, and that the Council had the opportunity of appointing to that office a former student in the Society's School.

Lastly, it was announced that a number of official invitations had been received from the President and Secretary of the American Pharmaceutical Association, to attend the forty-first annual meeting of that body, which will take place next August in Chicago, and the Seventh International Pharmaceutical Congress, which will also be held there at the same time, and, upon the recommendation of the Committee, the President, Mr. Martin, and Mr. Martindale were appointed to attend those meetings as delegates from the Society.

Professors Attfield, Dunstan, and Green were re-appointed for the ensuing year to their respective chairs, Mr. Joseph Ince was appointed Lecturer on Pharmacy, and Mr. E. F. Harrison was appointed Assistant Lecturer in Chemistry.

The Vice-President, together with Messrs. Atkins, Grose, Johnston, Leigh, Newsholme, Richardson, Schacht, Southall, and Storrar were appointed delegates to the meeting of the British Pharmaceutical Conference at Nottingham. On the motion of the PRESIDENT, Mr. STORRAR, together with Mr. LAIDLAW EWING and Mr. KERR, were appointed delegates to attend the Congress to be held in Edinburgh at the end of July, invitations to which have been received from the British Institute of Public Health.

The report of the General Purposes Committee stated that a large number of persons have paid penalties and costs for infringements of the Pharmacy Acts, and that further cases are standing for trial. On the recommendation of the Committee proceedings were ordered in a large number of cases of alleged infringements, and it was decided to instruct the Society's solicitor to proceed with the appeal against the decision of the judge of the Manchester County Court in the case of DELVE, reported in the Journal of June 24.

### CHOLERA AND DISINFECTANTS.

THE rumours that are being circulated as to the probable recurrence of cholera will naturally direct general attention to the subject of disinfection and to the materials applicable for the purpose. Among these carbolic acid holds a prominent place in regard to efficacy, and since its production has been cheapened it has rendered valuable service as a popular disinfectant. But it has also acquired an evil repute as a very frequent cause of accident in consequence of its poisonous nature. Owing to that circumstance it has often been suggested that the sale of carbolic acid should be placed under the same restrictions which apply to other poisons. However, the medical advisers of the Privy Council have steadfastly opposed the addition of carbolic acid to the poison schedule on the ground that there should be no obstacle to the supply of a material so useful and sometimes so necessary for the public health. It is possible that this point might receive full consideration while the danger attending the use of carbolic acid would also be removed, if it were allowed to be sold only in a state of solution, but it must be admitted that owing to the sparing solubility of carbolic acid there would probably be some practical objections to that method.

Upon a somewhat similar principle, however, other substances have been applied as disinfectants which are chemically related to carbolic acid and generally associated with it in origin. The various cresols, constituting the less volatile portion of the crude material from which carbolic acid is obtained, share with carbolic acid the property of acting as antiseptics and disinfectants. They have also the advantage of being comparatively much less poisonous, but owing to the fact of their being very sparingly soluble in water, they can only be used for disinfecting purposes when converted into emulsion and thus made mechanically miscible with water. Preparations of this kind are largely employed on the Continent, and quite recently several preparations of the same description have been introduced here as antiseptics and disinfectants under fancy names. These preparations have the advantage of being potent destroyers of bacteria and the germs by which infectious diseases are supposed to be communicated.

Another substance which possesses conspicuous efficacy as a disinfectant is mercuric chloride or corrosive sublimate. A solution of it—coloured with "commercial aniline blue."—has been recommended as the best agent for the purpose by the Medical Officer of the Local Government Board. The chief objection to the use of mercuric chloride is its highly poisonous nature, which necessitates great care in order to prevent accident. There are, moreover, substantial objections to the mode in which it is directed to be used. Half an ounce of a poison so formidable as corrosive sublimate is a dangerous quantity to introduce into a household and for unskilled hands to operate with. The description given of the colouring material that is to be used in making the solution, for the purpose of guarding against misuse or accident, is too indefinite, and, as Dr. MURRELL has pointed out in the *British Medical Journal*, there are several kinds of "commercial aniline blue," some of which are applicable for the purpose intended while others are not. Dr. MURRELL has, therefore, suggested that corrosive sublimate might be in some way prepared for use as a disinfectant so as to get rid of the various objections above mentioned.

The suggestion that corrosive sublimate should be prepared for use by compressing it has been responded to by Mr. MARTINDALE and Messrs. BURROUGHS, WELLCOME and Co., who make it into coloured tablets which readily dissolve in the proportion of water requisite for making the solution proper for disinfecting purposes. Messrs. ALLEN and HANBURY put it up in the shape of cartridges, enclosed in a muslin case, and of such a size as to make one gallon of the solution. Another preparation of this substance has also been introduced in a liquid form, under the name of Chloral-Marye, for disinfecting purposes. It is made of such a nature as to afford security against misapplication by the addition of a green-coloured salt, which has itself some value as a disinfectant and antiseptic. As the preparation bears dilution with a considerable quantity of water, it is therefore in a convenient form for domestic use. Since it contains a scheduled poison, it must, of course, be labelled "poison," and, in conformity with the Pharmacy Act, it can only be sold by persons legally qualified to sell poisons. This necessity is, however, to be regarded as a distinct advantage, from the point of view of public safety, since the warning afforded by the "poison" label is a protection against accident or misuse, and the restriction of sale to the hands of persons conversant with the poisonous nature of the article will operate in the same direction. We have mentioned these articles especially, since they are novelties which present, in convenient form, materials which are respectively among the best in regard to efficacy for the purpose of disinfection, and we need only add that these, like all other materials of a similar nature, must be used with due care.

### POISON LAW IN AUSTRALIA.

Three recent cases of prosecution instituted under the Pharmacy Act by the Pharmacy Board of Victoria are interesting as showing that in Australia there is a tendency to adopt the same view of the objects and application of the Pharmacy Acts that has been taken in this country by judicial authorities.

One case was a prosecution of the secretary of a sanitorium company professing to cure drunkenness for having, without legal qualification, sold a preparation containing strychnine. This was described as "Tyson's Vegetable Cure for Drunkenness," and it was proved to contain 0·11 per cent. of strychnine. The medicine was sold in two bottles, for which ten guineas was the charge, and a man who took some of it died shortly afterwards, though it was not alleged that he had been poisoned. To promote the sale of this medicine the usual advertising devices were resorted to by the company, but the "Dr. Tyson" referred to in the published statements appeared to be a mythical person in America from whem the medicine was stated to be obtained. For the defence it was contended that the Pharmacy Act was never intended to apply to proprietary articles, but merely to restrain the sale of poisons themselves, and the seller of the medicine admitted that he had no idea it contained strychnine until he heard the evidence of the analyst. The result was that the court held the case proved, and inflicted a fine amounting with costs to £15 10s.

In another case the assistant-secretary of a shire council was prosecuted for selling strychnine without legal qualification. It was shown that the supply of this poison for the destruction of vermin was frequently undertaken by shire councils throughout the colony, and that owing to the number of deaths occasioned by the careless use or custody of the poison it was necessary to enforce observance of the Act. Warnings of that intention having been disregarded, it became the duty of the Pharmacy Board to prosecute in the interest and for the safety of the public. The point relied upon by the defence was that the sale was a wholesale transaction within the meaning of the Act, and it was represented as a hardship that shire councils should not be allowed to assist in the work of rabbit extirpation by supplying strychnine for that purpose. However, the Court held that view to be untenable, more especially since the poison had been supplied without observance of the precautions of labelling and colouring as required by the Act, and decided that there was no option but to convict the defendant, and inflicted a fine amounting with costs to £10 9s. 6*d*.

In the third case a registered pharmaceutical chemist was charged with the two offences of having sold an ounce of strychnine without making an entry of the sale, and of having neglected to label the poison as the Act directs. Stress was laid upon the culpability of these omissions on the part of a qualified person to whom the sale of such articles had been entrusted by law, and on behalf of the Pharmacy Board it was stated that in such cases there was no alternative but to prosecute. The defendant pleaded guilty and fines were inflicted in regard to both offences, amounting with costs to £13 6s., the magistrate intimating that in any future case he should inflict the full penalty of twenty pounds.

### TANNIN AND THEINE IN TEA.

The *Lancet* publishes a statement of results obtained in some experiments undertaken in order to determine the constituents of a cupful of tea infusion as it is ordinarily made and presented to the drinker. Indian and China teas were experimented with on similar lines, an ordinary breakfast cup holding half a pint being taken as the standard of measure of the water employed, and a moderately heaped-up teaspoonful (nearly forty grains) as the standard weight of tea. A teaspoonful of tea was in each experiment infused in a breakfast cupful of ordinary tap-water, just raised to the boiling point, and the infusion allowed to stand for either five or fifteen minutes. The results of the experiments are relied upon as indicating that China teas contain from 5 to 6 per cent. of tannin, while Indian teas contain an average of 10 per cent., and that both contain alike an average of 3·4 per cent. of theine. It is inferred that distilled or softened water extracts the tannin more rapidly than ordinary water, but effects no increase in the amount of theine dissolved, and the addition of carbonate of soda to the water used has a similar effect. China teas may safely be left to infuse longer than Indian, since an excess of tannin is unlikely to be dissolved from the former within fifteen minutes, though seven minutes at most is sufficient time for Indian teas to infuse. It is stated that the theine and tannin usually amount to only one-fourth of the total extractive matter found in the infusion, except in the case of some Indian teas particularly rich in tannin. Finally, the best results are said to be obtained when the tea is powdered immediately before use, and the infusion, in moderately hard water used the moment it reaches boiling point, allowed to stand for only five or seven minutes. It is stated that the flavour is then exquisite, the theine is completely extracted, and a minimum of tannin dissolved, whilst no sacrifice of body or strength is perceptible. The data given are, in some respects, so far from being in accord with previous carefully conducted experiments that they suggest doubts as to their accuracy. In the absence of descriptions of the methods adopted for the determination of the tannin and theine it is, of course, difficult to form a decided opinion on the point, but in any case the comparison between Indian and China tea is made upon a very inadequate basis.

### POISONING BY CARBOLIC ACID.

At an inquest held in Durham on the body of a man who had been accidentally poisoned by carbolic acid, the Coroner severely condemned the practice of the Urban Sanitary Authority in supplying this article without suitable precautions for preventing accident. The foreman of the jury also expressed the opinion that the present system of supplying carbolic acid for sanitary purposes should be amended. In referring to the use of the poison label by chemists when selling carbolic acid, it appears to have been assumed, both by the Coroner and the jury, that this is required by law instead of being, as it is, a voluntary proceeding instigated by the chemist's knowledge of the dangerous nature of the material, and by the desire to protect the public by giving practical effect to the intention of the Pharmacy Act even in cases where its provisions do not bind them. That is of course not to be expected when carbolic acid is supplied by persons who have no such knowledge to guide them and no legal responsibility.

### THE MUSEUMS' ASSOCIATION.

In the course of his presidential address to the members of this Association, Sir Wm. H. Flower said that though the first duty of museums was to preserve the materials upon which the progress of art and the knowledge of science were based, the objects contained in them should be arranged in such a manner as to provide for the instruction of those who visited them. The value of a museum would, in the future, be tested by the treatment of its contents as a means of advancing knowledge, and the curator of a museum, if he was fit for his duties, must be a man of very considerable education as well as natural ability. His education must not be dissimilar in fact to that of members of the learned professions. What was desired in museum reform might be embodied in two words—research and instruction, the functions of museums being twofold according to all recent writers on the subject: (1) To advance and increase the knowledge of some given subject; (2) to diffuse that knowledge among the mass of the people. In the old museums these two distinct objects were nearly always confounded and, in the attempt to combine them in one exhibition series, neither was practically accomplished. Their absolute separation was necessary, as was also the totally distinct treatment of the specimens according to the purpose they were required to fulfil.

### J. S. LESCHER.

At the moment of going to press we learn with regret of the death, on the 5th instant, of Mr. Joseph Sidney Lescher, Pharmaceutical Chemist, in his ninetieth year. Mr. Lescher was one of the Founders of the Pharmaceutical Society.

### COLD BATHS AND LEUCOCYTOSIS.

The *Lancet* refers to an account by Dr. Thayer of some observations made at the Johns Hopkins' Hospital with reference to the increase of leucocytes in the blood after cold baths. One observer has found an appreciable increase, both in normal individuals and fever patients, as early as half an hour after the exposure to cold, and he suggests that this leucocytosis is an important factor in causing the beneficial result that frequently occurs when cold baths are employed in typhoid fever cases. Other investigators, studying cases of typhoid and pneumonia as well as individuals in a healthy condition, obtained results confirmatory of those first mentioned. The effect of local applications of cold on the state of the blood remains to be determined, and as regards the red corpuscles, cold baths seem to cause no constant change in their numbers or appearance.

### CAMBRIDGE SUMMER MEETING.

We have received from the Cambridge University Extension authorities the programme of their summer meeting for the present year. Courses of study extending over a month (from July 29 to August 26, inclusive) have been arranged, intended primarily for those connected in some way with the University Extension movement, though all members of the teaching profession and other students are also admitted. Though the full course extends over a month, it has been arranged that those who can only spare a fortnight shall have a fairly complete course of instruction, the subjects in which it is offered being extremely varied, including history, literature and language, art, economics, and natural science. On the scientific side several courses of laboratory work are provided, and in addition there will be a set of lectures illustrating from the history of several sciences the progress and methods of natural science. The services of Sir Robert Ball, Sir Henry Roscoe, Mr. M. M. P. Muir, and a number of other well-known scientific lecturers have been secured. The authorities have not overlooked the fact that August is a time for recreation as well as study, and have made special arrangements for boating, for admission to college gardens, and for several excursions to places of historic, artistic, or scientific interest. Three colleges have agreed to board students at extremely moderate rates, and a list of other lodgings is included with the programme, together with a map of Cambridge. We understand that the total expense of the month for a student living economically need not exceed six or seven pounds.

### ROTHAMSTED JUBILEE FUND.

At a meeting of the Executive Committee of this Fund, held on Monday, it was reported that it now amounts to £572 13*s*. The granite memorial which it is proposed to erect in front of the laboratory at Rothamsted is nearly completed, and the portrait of Sir John Lawes, by Mr. Hubert Herkomer, is in progress. The memorial will be dedicated and addresses presented to Sir John Lawes and Dr. Gilbert by various learned societies, on Saturday, July 29, at 3 p.m. Until that date the Fund will remain open, and subscriptions may be sent to Mr. Ernest Clarke, Honorary Secretary, 12, Hanover Square, W.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, July* 5, 1893.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

Messrs. Abraham, Atkins, Bottle, Greenish, Hampson, Hills, Johnston, Leigh, Martindale, Newsholme, Richardson, Schacht, Southall, Storrar, and Young.

The minutes of the previous meeting were read and confirmed.

The **President** said he regretted to announce that the Vice-President was unavoidably absent, on account of the death of a relative. The Vice-President's chair was taken by the Treasurer.

### Elections.

#### MEMBERS.

*Chemists and Druggists.*

The following, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Critchley, Thomas | Blackburn. |
| Yates, Daniel | Blackburn. |

#### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Grimshaw, William Henry | Blackburn. |
| Hughes, Henry John | Upper Parkstone. |
| McAllister, Robert Dempster | Biggar. |
| Mager, William Kelk | Queenstown, S. Africa. |
| Pickup, William | Blackburn. |
| Richards, Fred. | Shaftesbury. |
| Rose, Joseph Gandy | Urmston. |
| Wells, William | Blackburn. |

#### ASSOCIATES.

The following, having passed the Minor Examination and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Neil, Henry | Stirling. |
| Riley, Joseph Arthur | Seaforth. |

#### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Allen, Samuel Joseph | Leicester. |
| Burrell, Frederick Charles | Midd Rasen. |
| Carter, Henry George | Birmingham. |
| Green, George Edward | Sevenoaks. |
| Green, Sydney Herbert | Bilston. |
| Low. Alexander Taylor | Alva. |
| MacDonald, Angus | Coatbridge. |
| Munday, Edgar Frederick | London. |
| Savage, Thomas Evans | Caersws. |
| Smith, Frank | Bourne. |
| Smith, Harold | Birmingham. |
| Turnbull, William | Dublin. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and the restoration fee of one shilling.

### Restorations to the Register.

The names of the following persons, who had severally made the required declaration and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Brothwood, Harry Skarratt, 291, Parramatta Road, Leichhardt, Sydney, N.S.W.

Jenkins, John, 132, Kimberley Road, Nunhead, S.E.

Sturdy, Thomas Metcalfe, 11, Balfour Street, Oldham.

### The Executive of the North British Branch.

The **President** said a letter had been received from Mr. J. R. Hill, the Assistant Secretary in Edinburgh, stating that at a meeting of the Executive on June 8, Mr. Jas. Laidlaw Ewing had been elected Chairman and Mr. C. Kerr, Vice-Chairman of the Executive for the ensuing year.

### Report of Finance Committee.

The report of this Committee was read. It recommended the payment of the usual monthly and quarterly accounts, and the placing of £2000 on deposit account at the bank.

The **President** (as Chairman of the Committee) moved the adoption of the report and recommendations, in which there was nothing calling for special comment either on the General or Benevolent Fund account.

The resolution was adopted unanimously.

### Report of the Benevolent Fund Committee.

The report of this Committee included a recommendation of the following grants:—

£15 to the widow (aged 45) of a former associate in business and subscriber to the Fund, who died in February last insolvent. Applicant has two children dependent on her, and is desirous of starting in a small business. (Ashby-de-la-Zouch).

£15 to a former member (aged 49), from 1873 to 1878, and subscriber. Has failed in business, and is now acting as an assistant. (Hastings).

£10 to a registered chemist and druggist (aged 53), who was for some time in business in Belfast, and is now out of employment; has a wife and four children.

Four other applications, one of which had been deferred for further information, the Committee declined to entertain, and one other application was deferred.

The **Secretary** reported the death of Mrs. Rebecca Mumbray, who was elected an annuitant in 1891, on June 14, aged 70.

Mr. **Hampson** said he had to act as Chairman of this Committee in the absence of the Vice-President, and he now therefore moved the adoption of the report and recommendations. Eight cases were considered, four of which were not assisted, as the Committee did not consider them of the right character, but £40 in all was voted to the other cases. He was glad to announce that the recent appeal by the Vice-President for votes on behalf of the orphan daughter of Mrs. Minett had been successful, and the little girl had been elected into the London Orphan Asylum. The mother was very anxious to get another child into the Infant Orphan Asylum at Wanstead, the election to which would take place in November next, and he now appealed, therefore, to members and friends to bear this in mind and use their influence to secure success. With regard to the Orphan Fund, he regretted to say that at present it seemed stationary, and he wished therefore to call special attention to the fact of its existence and to invite contributions to it. The Committee ought to have at least £100 or £150 ready to use at any time.

The motion was seconded and carried unanimously.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Library.*

The Librarian's report had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| May . . | Day . . | 493 | 27 | 10 | 19 |
| | Evening . | 162 | 13 | 2 | 7 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| May . . . . | 215 | 115 | 100 | £1 3*s.* 3½*d.* |

Donations to the Library had been announced (*Pharm. Journ.*, June 17, p. 1038), and the Committee had directed that the usual letter of thanks be sent to the respective donors.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| May . . | Day . . | 382 | 29 | 5 | 14 |
| | Evening | 88 | 11 | 2 | 3 |

Donations to the Museums of the Society in London and Edinburgh and to the Herbarium had been announced (*Pharm. Journ.*, June 17, p. 1038), and the Committee had directed that the usual letter of thanks be sent to the respective donors.

The staff of the Society's School had attended and reported on the various classes.

#### *Local Secretaries in Scotland.*

The Committee had recommended that the report of April 20 of the Executive of the North British Branch, and the suggestions contained therein, be received and adopted, subject to certain modifications. The result of this would be the appointment of local secretaries in fourteen new centres, and the appointment of two assistant local secretaries for Dundee, four for Edinburgh, and three for Glasgow.

The Committee had further considered the subject of the teaching of materia medica in the School, and recommended that a professorship of materia medica be established, to which the subject of pharmacy may be subsequently attached, the stipend to be £100 a year and the students' fees. The President was requested to draw up the conditions of the appointment, and subject to these and the approval of the Council the Committee had recommended the appointment of Mr. H. G. Greenish to this chair.

The Committee had also recommended that Mr. Joseph Ince be appointed Lecturer in Pharmacy in the Society's School.

#### *International Pharmaceutical Congress.*

Invitations from the American Pharmaceutical Association having been read, the Committee recommended that the President, Mr. Martin, and Mr. Martindale be appointed delegates to the Seventh International Pharmaceutical Congress and to the forty-first annual meeting of the American Pharmaceutical Association, to be held in Chicago in August next.

The **PRESIDENT** (as Chairman of the Committee), in moving the adoption of the report and recommendations, said the first part was merely formal, referring to the donations to the Library and Museum, but he must make special reference to the magnificent collection of rare essential oils from Messrs. Schimmel, of Leipzig, accompanied by about 100 copies of a very full and descriptive catalogue. This gift had been referred to before, but the specimens had not then been received, and he now desired, on behalf of the Council, to thank the donors for this magnificent collection. These gentlemen were typical manufacturers of essential oils, and these were specimens of the newest and rarest oils, and would be very useful for purposes of comparison. He could not speak too highly of the generosity and public spirit of this firm. With regard to the report of the North British Branch, dealing with the subject of local secretaries in Scotland, the Committee had considered the recommendations very carefully, and with one or two minor alterations approved of them. Their friends in the north hoped that in this way they would be able to awaken more interest in the work of the Society, and to encourage members of the trade to join the Society in larger numbers. The geographical conditions of Scotland rendered it difficult for local secretaries to get very far from their particular centre, and this scheme was based on a careful consideration of the circumstances, with the view of enabling the officers of the Society to reach those who were out of the populous districts. If the Executive in Scotland succeeded in fulfilling their expectations in even a moderate degree, the Society would have great cause for congratulation. Turning to the latter portion of the report, he would remind the Council that about a year ago a resolution was passed with regard to the teaching of materia medica, referring the subject to this Committee, and the recommendations now made were the result of mature and repeated deliberation. Mr. Henry George Greenish was probably the only living English pharmacist who had had a thoroughly high-class training in the histology of materia medica and in materia medica generally in its widest sense as it was studied in the University of Dorpat. Three years ago he was asked to undertake demonstrations in materia medica for a session or two to see if the arrangement would be beneficial to the School. At that time he was good enough to accede to the wishes of the Council, and he had carried on the work in that department to the entire satisfaction of the School staff and of the Committee. He was also extremely popular with the students, not because he pandered to their grievances, but because he spared no pains in showing them how to do their work. Provision had been made for histological teaching in other departments, and the Committee thought the Society was bound to take up materia medica, especially now that it had been practically removed from the medical curriculum. Of course he did not use the word in quite the same sense in which medical men used it as connected with therapeutics; pharmacists had nothing to do with that. What they had to study was the composition, histologically and chemically, of a drug, and to get to know all about it. He need not say that the very small emolument Mr. Greenish had received was not what the Council would wish to continue, and so after the experiment had been continued for a couple of years, he brought the question before the Council for further consideration. The result was that Mr. Greenish's liking for his work had intensified, and he desired to forsake pharmacy as a business and to devote himself to scientific work, even at some considerable sacrifice of income. Having regard to the fact that the Committee would have had great difficulty in finding a professor of materia medica of modern training, whatever stipend might have been offered, it was a source of great gratification that one of their own pupils, himself a pharmaceutical chemist, possessed in so high a degree the requisite qualifications, and the Committee therefore recommended that Mr. Greenish should be offered the appointment. It was proposed that his title should be that of Professor of Materia Medica, and the Committee recommended that in due course pharmacy should be attached to it. Materia medica naturally allied itself with pharmacy, part of it was pharmacy, and it was proposed that that should be the ultimate arrangement. Mr. Ince had fulfilled the duties of teacher of pharmacy, giving practical demonstrations for some years, and his services also were much appreciated by the students, and he had a large class. In fact, his work was considerably greater at present than that which devolved upon the materia medica side of the School, partly because more of it was required for the purposes of the examination and partly because the students took longer in acquiring certain branches of pharmacy than they did in acquiring some other portions of the subject of materia medica. Mr. Ince's emoluments, therefore, from fees were proportionately larger, and the Committee thought that in future Mr. Ince should be designated Lecturer in Pharmacy. In days to come, as he had mentioned, the Professor of Materia Medica would have to take charge of the subject of pharmacy, either doing it himself or by the aid of a demonstrator, lecturer, or assistant, as might be arranged. The work which Mr. Greenish was undertaking was of very great importance, and had been greatly appreciated by the students; so much so that the chief difficulty was to find enough time for the acquisition of this branch of knowledge. It was to him a source of great gratification that the tendency of the students had been distinctly in favour of taking a wide view of their studies, wider than that required for merely passing the examinations, and he held it to be very important that the Society's School should be the first of its kind. In all other countries the State either subsidised the School of Pharmacy or supported it entirely, as was the case in France, Germany, and even in Denmark. In England we were not in that happy condition, but in the still happier one, according to the prevailing opinion in Great Britain, of putting our hands in our own pockets to provide what was required, and institutions so supported were not always inferior to those maintained by the State.

Mr. **Storrar** hoped the Council would unanimously adopt the report from Scotland with regard to the rearrangement of the local secretaries. He believed that at the present moment the trade or profession was more loyal to the Society than at any previous time, but unfortunately that loyalty did not in a great many instances translate itself into membership. The matter had been before the Executive for a considerable time, and they came to the conclusion that the only way to increase the membership was a personal appeal on the part of the local secretaries, and in order to accomplish that it was necessary to rearrange the districts and increase the number. And there was something more involved than a mere increase of the number. There were three local secretaries in Fife, one in each of the three groups of boroughs which returned members to Parliament, but outside the boroughs there were a large number of chemists who were not looked after at all. It was proposed that the three local secretaries should work together, the senior calling a meeting once a year, seeing that no one in the trade was overlooked, but that everyone was called upon and asked to join the Society. The report from each county or district would be a general report, presented to the Executive each year. He sincerely hoped that the result would be a large increase in the membership in Scotland.

Mr. **Schacht** said although a member of this Committee, it happened from various reasons that he had not been able recently to take any part in its proceedings, and he should like, therefore, to take the opportunity of saying how thoroughly he approved of the report in all its parts, more particularly in that which referred to the appointment of these two gentlemen to the respective positions of Professor and Lecturer. It was a matter of very great personal gratification to him to know that a gentleman sprung immediately from their own ranks was so capable of fulfilling the duties of a professor in the important department of materia medica, and the more so as from all he could gather this gentleman brought not only great ability to the discharge of his duties, but he appeared to enter on them in just the spirit which they all wished to see pervading the professorial body. His appointment would strengthen the staff of the School by his powers of teaching, and would also enhance what he believed was the tone and spirit which pervaded it. With regard to the emolument, it was a matter of great regret that they could not meet the proper claims of the professors in the way they would like, but he feared a large portion of their reward must always come from a feeling of satisfaction that they were doing good work. He had no doubt that that operated more or less with all of them, and in the present case he was quite sure that that feeling of enthusiasm would come out in a practical manner. He understood that Mr. Greenish's desire was that which actuated every really scientific man, to enlarge the realm of knowledge, and he had no doubt that his abilities and experience would enable him to succeed. With respect to Mr. Ince, it was only fair and right that his position should be recognised, and that the title of Lecturer should be conferred upon him. He had much pleasure in seconding the motion.

The **President**, in putting the question, said that although the gentleman who was recommended for the professorship bore the name of Greenish, he was recommended entirely on account of his own personal qualifications. Still it was none the less satisfactory to know whose son he was.

The resolution was carried unanimously.

### Appointment of Professors.

Professor **Attfield** was appointed Professor of Practical Chemistry for the ensuing year.

Professor **Dunstan** was appointed Professor of Chemistry for the ensuing year.

Professor **Green** was appointed Professor of Botany for the ensuing year.

Mr. **Joseph Ince** was appointed Lecturer in Pharmacy for the ensuing year.

Mr. **E. F. Harrison** was appointed Assistant Lecturer in Chemistry for the ensuing year.

### The British Pharmaceutical Conference.

The following gentlemen were appointed delegates to the Pharmaceutical Conference, which meets at Nottingham on August 14. The Vice-President and Messrs. Abraham, Allen, Atkins, Grose, Johnston, Leigh, Newsholme, Richardson, Schacht, Southall, and Storrar. The Secretary, Editor, and Sub-Editor were also requested to attend.

### General Purposes Committee.

The report of this Committee, which was as usual read and considered in committee, included a letter from the Solicitors with regard to legal cases placed in their hands. A large number of persons had paid penalties and costs for infringements of the Pharmacy Acts, and some cases were standing for trial. The Committee had recommended that the Solicitors be instructed to appeal against the decision of the judge of the Manchester County Court, in the case of Delve, reported in the Journal of June 24. A large number of cases of alleged infringement of the Act were considered by the Committee and proceedings recommended.

The report having been considered,

The Council resumed, and the report and recommendations were unanimously adopted. Formal resolutions were also passed authorising the Secretary and Registrar to take proceedings against certain persons named.

### CORRESPONDENCE.

A letter was read from the Chester Chemists' Association, thanking the Council for the gift of materia medica specimens.

The **President** read a communication which had been received from the British Institute of Public Health, inviting the Society to send delegates to the Congress in Edinburgh, from July 27 to August 1, and containing a long list of subjects to be discussed, including the working of the Sale of Food and Drugs Act. He proposed that Mr. Storrar, with Mr. Laidlaw Ewing and Mr. Kerr, Chairman and Vice-Chairman of the Executive in Scotland, be appointed delegates on behalf of the Society to attend the Congress. This was unanimously agreed to.

Letters had been received from Professor Warden, Calcutta; Mr. C. A. Barber, Antigua; and Professor Andrew Ferrein, St. Petersburg, thanking the Council for their election as Corresponding Members.

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## SCHOOL OF PHARMACY EXAMINATION QUESTIONS.

*Session.*—1892–93.

### PHARMACY AND PRACTICAL PHARMACY.

MR. INCE.

SESSIONAL EXAMINATION FOR A SILVER MEDAL.

*Monday, July* 3.—*Hours from* 10 *to* 1.

1. Describe various modes of the preparation of Glycerin, together with its applications in galenical and dispensing pharmacy.

2. Write a short account of Desiccation, including special methods, giving reasons for their employment.

3. Show by illustrative examples the connection between chemical science and the production of essentially pharmaceutical substances.

### MATERIA MEDICA.

MR. H. G. GREENISH.

SESSIONAL EXAMINATION FOR A SILVER MEDAL.

*Monday, July* 3.—*Hours from* 2 *to* 5.

1. In judging the quality of fixed oils what general data would you ascertain, and how? What special reactions would indicate the presence of sesame oil, of cotton-seed oil, and of peach-kernel oil?

2. What classes of bodies are met with in the official volatile oils? Give two examples of each. How would you detect turpentine in pine-leaf oil, kerosene in eucalyptus oil? What tests would indicate impurity in gaultheria oil, in clove oil, in lavender oil?

3. Describe the physical characters of ipecacuanha root and stem. With what substitutes for Brazilian ipecacuanha are you acquainted? How may they be distinguished? Give a process for the approximate estimation of emetine. What percentage would you expect in good root, in stem, and in the various substitutes?

4. Describe the commercial varieties of coca leaves. Name the botanical source of each. What alkaloids have been obtained from coca leaves? In what relation do they stand to one another? Give a process for the assay of the leaves. What tests would you apply to ascertain the purity of commercial hydrochlorate of cocaine?

### PHYSICS.

PROFESSOR DUNSTAN.

SESSIONAL EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

*Tuesday, July* 4.—*Hours from* 10 *to* 1.

1. Explain what is meant by the critical point of a gas or vapour. Give examples.

2. From the following data calculate the latent heat of steam:—

Weight of water ($t = 15°$) ... 900 grammes.
Temperature of mixture ... 49°·5
Weight of steam condensed... 56 grammes.

Explain how the experiment is conducted.

3. Describe the Poggendorff or bichromate battery. What are its advantages?

4. Explain what occurs when a ray of white light passes through (i) a prism, (ii) a plate of tourmaline, (iii) Iceland-spar, (iv) a Nicol's prism.

5. Give an account of (i) Fraunhofer's lines, (ii) dextro-rotation of the polarised ray, (iii) an electric motor.

### CHEMISTRY.

PROFESSOR DUNSTAN.

SESSIONAL EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

*Tuesday, July* 4.—*Hours from* 2 *to* 5.

1. Give an account of the methods by which the chief inorganic silicon compounds are prepared. Contrast them with the methods of preparing the corresponding carbon compounds.

2. It has been found that when 0·8784 gramme of pure zinc dissolves in a solution of pure copper sulphate, 0·8510 gramme of copper is deposited. Taking 63·33 as the atomic weight of copper, calculate the atomic weight of zinc, and explain how the accuracy of this number has been verified.

3. Describe how the following compounds may be obtained from glycerol:—tartronic acid, oxalic acid, dextrose, citric acid, and propyl-iodide. Explain the reactions with the aid of diagrams.

4. Give an account of the isomerism of the different varieties of tartaric acid.

5. Describe the constitution and chief methods of obtaining the following compounds:—phenol, salicylic acid, camphor, pyridine, quinoline, conine.

### PRACTICAL CHEMISTRY.

PROFESSOR ATTFIELD.

*Wednesday, July* 5.—*Hours from* 10.30 *to* 1 *and* 2 *to* 5.

*Books and Memoranda permitted.*

*Manipulation as well as results will be scrutinised.*

1. Name the official organic substance "A," and give, in a few lines, the reasons for your decision.

2. Analyse the crystals "B," and describe, briefly, the operations performed and the conclusions reached.

3. Qualitatively examine the official fluid "C," sufficiently to enable you to state its name, and write a short paragraph descriptive of your experiments.

4. Is the sample of "Tartaric Acid" pure? State, succinctly, the grounds of your opinion.

5. How much acid, reckoned as acetic, is present in the "Vinegar?"

### MATERIA MEDICA (PRACTICAL HISTOLOGY).

MR. H. G. GREENISH.

SESSIONAL EXAMINATION FOR A SILVER MEDAL.

*Thursday, July* 6.—*Hours from* 10 *to* 1.

Cut and describe transverse sections of—

(*a*) Eucalyptus leaf.
(*b*) Podophyllum rhizome.
(*c*) Pomegranate bark.

Illustrate your description by sketches, and leave a section of each drug mounted in glycerin for inspection.

*Thursday, July* 6.—*Hours from* 2 *to* 5.

Cut and describe transverse sections of—

(*a*) Bearberry leaf.
(*b*) Arnica rhizome.
(*c*) Cinchona bark.

Illustrate your description by sketches, and leave a section of each drug mounted in glycerin for inspection.

# Proceedings of Societies in London.

## BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 16, Bloomsbury Square, on Thursday, June 29, at 4.30 p.m. Present:—Messrs. E. M. Holmes, A. W. Gerrard, and Messrs. W. A. H. Naylor and F. Ransom, Hon. Gen. Secretaries.

In the absence of the President and a Vice-President, the chair was taken by Mr. E. M. Holmes.

The minutes of the previous meeting were read and confirmed.

A letter was read from Mr. M. K. Johnson, stating that as he was entering into business on his own account, at a considerable distance from London, he was reluctantly compelled to resign his position as Assistant Secretary to the Conference. It was moved, seconded, and carried "That the thanks of the Executive Committee be given to Mr. Johnson for his services during the time that he has held the position of Assistant Secretary to the Conference."

Mr. J. C. Nightingale, a former Assistant Secretary, was appointed to act *pro tem.*

An application for a money grant to aid in the conduct of a research in connection with coto bark was considered and granted.

A final proof of the circular to be issued by the Local Committee inviting members to the forthcoming meeting of the Conference at Nottingham was laid before the Committee.

Communications were read having reference to the place of meeting of the Conference in 1894.

Ten gentlemen were nominated and elected to membership.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The ninth botanical excursion of the above Association took place on Saturday, the 1st inst. Alighting from the train at Bexley, Kent, a course was taken along the road and through the fields to Joyden's Wood, where in the gravelly soil an abundance of *Convallaria majalis* was met with. Emerging from the wood into the Swanley Road, *Atropa Belladonna* in quantity was found in one chalk pit, and *Orobanche major*, growing upon *Centaurea Scabiosa*, in another. Other uncommon plants observed were *Verbascum Lychnitis*, *Erigeron acre*, *Triglochin palustre*, *Onopodon Acanthium*, *Rhamnus catharticus* and *R. Frangula*. At Swanley Station, whence train was taken for London, *Lupinus luteus*, L., was found thoroughly naturalised on the railway embankment. Altogether a much greater variety of plants was collected in this than in any previous ramble; eighty-four being the number of species found.

## LONDON INSTITUTION.

### BACTERIA, THEIR NATURE AND FUNCTION.*

(*Concluded from page* 17.)

I now proceed to give you a short summary of some of the most important activities which bacteria exhibit.

### *Bacteria causing Decomposition of Albumin.*

Foremost in importance and vastness of result is the action which certain species of bacteria have on albuminous matter, an action which is termed *putrefactive decomposition of albumin*, animal or vegetable. All organic matter when deprived of life is resolved into simpler coumpounds, is broken up into lower nitrogenous principles, like leucine, tyrosine, indol, phenol, etc., of which the ultimate products are ammonia, nitrites, and nitrates. The plant, it may be said in a general way, builds up albuminous matter from nitrates, this albuminous matter it is which forms the protoplasm of its cells, this albuminous matter it is which serves as nitrogenous food for animals; these again supplying the food for other animals and man. In the living body of these the albuminous matter becomes broken up, yielding nitrogenous principles like urea and allied substances, which again, after further oxidation in the soil and in water, serve to supply nitrates to the plant; but also the bodies of animals and plants after death form a large stock from which by a long chain of processes, induced and sustained by micro-organisms, lower nitrogenous compounds, and ultimately ammonia and nitrates, are produced, from which the living plants principally draw their nitrogen.

From this it is evident that the vegetable kingdom is dependent for its nitrogen chiefly on processes by which from the albumin of dead organic matter, by the activity of micro-organisms, in the first place lower nitrogenous principles and ultimately ammonia, and in the second place, also by micro-organisms, nitrites and nitrates are formed. Now, the micro-organisms which are capable of producing the first series of decompositions of dead albuminous matter form, so to speak, the first army of attack; it is this army which, while multiplying at the expense of albumin, decomposes it, and thereby is instrumental in changing it into lower nitrogenous principles such as leucine, tyrosine, indol, and ammonia. Amongst the large number of species of putrefactive bacteria I will describe two only, which by their great distribution may be considered as playing a very important part in this decomposition of albumin. The first is the species known as *Proteus vulgaris*, the second is the *Bacillus coli*.

(*a*) *Proteus vulgaris.*—This species is the common putrefactive organism; it is almost invariably present in dead and decaying albuminous matter; it is the organism which in dead animals and man plays the principal part in the destruction and resolution of the body; it is present in the cavity of the normal intestine; it is found in connection with effete and dead matter occuring in the body in health and disease; it has a wide distribution in nature, and is present wherever organic matter happens to be in a state of putrescence; it is liable to pass from this and to be transmitted to other putrescible matter by air currents, by dust, by water, by human contact or otherwise, and then to set up in this new organic matter the same state of putrescence. The same applies to the *Bacillus coli*, which has also a very wide distribution, and is in most instances associated with putrefaction and decomposition of albuminous matter; it is a normal inhabitant of the human and animal intestine, and from here often passes into the soil, water, and air.

These two species of organisms may be considered then as being of great importance in the destruction and resolution of putrescible matter, in short of dead albuminous matter.

I show you here photographs of these two species as they appear in artificial cultures under various forms of cultivation, and under the microscope under a magnification of 1000. Both these species are motile bacilli.

The *Proteus vulgaris*, as its name implies, presents itself in forms so varied, that it is at first sight difficult to recognise them as belonging to one and the same species: coccus forms, short ovals, short and long cylinders, homogeneous long threads, and even spiral forms. But by artificial cultivation by exact methods they can be shown to belong to one and the same species; and it can also be shown that under particular conditions of cultivation the bacillus almost invariably shows itself as cylindrical and thread-like forms; whereas under other conditions it assumes the character of cocci and ovals. The photographs which I show you here give an exact representation of these cylindrical and thread-like forms observed in early gelatin plate cultures; later on, when the growth has proceeded for some days, and the gelatin has almost entirely become liquefied, the majority of the individuals are very short—either coccus-like or short ovals.

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* Lecture delivered at the London Institution, on February 27, 1893, by E. Klein, M.D., F.R.S., Lecturer on General Anatomy and Physiology at the Medical School of St. Bartholomew's Hospital, London.

It is on account of this unstable or protean character of its form that Hauser gave it the name of Proteus, and being the common microbe of putrid decomposition, he called it *Proteus vulgaris*.

This organism, as a first and important action, peptonises albumin and liquefies and peptonises gelatin; then this peptone is decomposed, yielding, amongst other substances, leucine, tyrosine, indol, skatol, phenol, and further, ammonia.

(*b*) The *Bacillus coli*.—The normal inhabitant of the intestine of man and animals is another powerful albumin decomposing microbe, but, unlike the proteus, it decomposes albumin without first converting it into peptone; it therefore does not liquefy gelatin like the proteus; it rapidly decomposes albumin, forming indol and allied bodies, and even ammonia.

*Bacteria Causing Ammoniacal Fermentation of Urea.*

In connection with these true putrefactive bacteria I have to mention a group of bacteria which, though not strictly connected with decomposition of albuminous matter, play an important part, inasmuch as their action supplements that of the former, the group in question consisting of species which can change urea and allied substances into ammonium carbonate. This action is generally and justly considered of the nature of a ferment or hydrating action, like that of other organised ferments to be presently described. But we mention this group here because by changing urea into ammonium carbonate it prepares, in one sense, the way for the action of certain other bacteria which, by oxidising ammonia into nitrites and nitrates, are the direct food-providers for the vegetable kingdom. Urea and allied substances, as stated above, are the last products of albuminous metabolism in man and animals, and therefore form an integral part of the material destined for the soil in which the plants of our gardens and fields live and thrive. I show you here one of the species of this group—for there are several—the *Micrococcus ureæ*; this is a coccus growing as a white staphylococcus, and forming connected masses in the natural or artificial culture media; it does not liquefy gelatin, and grows extremely rapidly at higher temperatures.

The photographs give you an idea of the character of this organism in plate, in streak, and stab-cultures, and in microscopic specimens; in these latter you notice that neither in size, arrangement, nor mode of division does this microbe show anything that would distinguish it from other species of staphylococcus; its action on urea being its chief distinguishing character, being capable of converting it into ammonium carbonate.

At present it is well established that nitrogenous principles like indol, phenol, and ammonia are produced during the decomposition of albumen by *Proteus*, *Bacillus coli*, and other putrefactive bacteria; and, further, that substances, as indol, phenol, and the like, are, by the activity of certain other bacteria not yet sufficiently investigated, converted into ammonia. We have now traced the decomposition of albumin down to ammonia, and in this condition it is subjected in the soil to the action of the *nitrifying bacteria*—that is, bacteria which oxidise ammonia and convert it into nitrites and ultimately into nitrates; these bacteria complete then the series of processes by which the nitrogen ultimately returns from where it started. It started as nitrates in the soil surrounding the roots of plants, and as nitrates it ultimately again finds itself in the soil; first it had been used by the plant in order to build up its albumin, then as vegetable albumin it represents the food of animals; in these it serves to build up the protoplasm of the animal body, from which it passes as food for carnivorous animals. The albumin of animals or plants becomes decomposed by putrefactive bacteria, the ultimate product of this, ammonia, becoming converted by the nitrifying bacteria of the soil into nitrites and finally into nitrates. "From earth to earth" expresses the beginning and end of this wonderful migration and change!

*Nitrifying Bacteria.*

Schlœsing and Muntz were the first to show that the conversion of ammonia into nitrates in the soil is most probably caused by micro-organisms, but not till the researches of Warington, Winogradski, and P. Frankland, were these micro-organisms isolated and more carefully experimented with. Warington, and particularly Winogradski, have shown that there are two species of bacteria which play an important part in these processes, one species converting ammonia into nitrites, the other these finally into nitrates. I show you here some lantern slides of Winogradski, in which these two species are well shown: the slides are of preparations of artificial cultivations, in which Winogradski has been extremely successful. These two species (the nitrous and the nitric organisms) are minute rod-shaped or oval bacteria; when in the act of dividing, they form short dumb-bells; the nitrous organism is larger than the nitric, but both show forms which possess celia, and therefore are possessed of motility. Winogradski has by artificial cultivations obtained both these species in large quantities, and, on testing them on liquids of suitable composition, found that the one is capable of converting ammonia into nitrites, the other these latter into nitrates. There can then be no doubt that the problem of the manufacture on a large scale of these nitrifying microbes, so important for agriculture, must be considered as solved.

*Bacteria of Leguminosæ.*

I have now to introduce to your notice a group of organisms which, like the former, are of interest and importance to the vegetable kingdom, at any rate to one portion of it, viz., the plants belonging to the Leguminosæ.

Hellriegel and Willfarth had shown that the excess of nitrogen in leguminous plants is obtained from the atmosphere by the instrumentality of bacteria in the soil around the roots of the plants; that these bacteria "fix" the free nitrogen contained in the soil, derived, of course, from the atmosphere; and that if the soil be sterilised, by which the bacteria are killed, no fixation of nitrogen can take place, and the growth of the leguminous plants remains appreciably attenuated. The roots of leguminous plants growing in the ordinary soil are known to possess numbers of nodular growths. These nodules have been thoroughly investigated by a large number of observers, and their importance in the process of fixing the nitrogen, and in the proper development of the plant, has been satisfactorily worked out; foremost amongst these stand the investigations of Professor Marshall Ward, of Sir John Lawes and Dr. Gilbert, of Beyerinck, Prazmowski, Nobbe, and Frank. Beyerinck, then Prazmowski, and particularly Nobbe, have shown that the nodules on the roots owe their origin to the growth in the tissues of the root of certain bacteria, and it is these bacteria which are instrumental in fixing the free nitrogen. These bacteria represent well-defined species, and, as Nobbe has shown, differ for the different leguminosæ.

My friend Professor Marshall Ward has been kind enough to supply me for examination roots of lupins containing the nodules, and I show you here some photographs as the result of this examination, illustrating the distribution in the tissue of the nodules of particular species of bacteria, then the character of these bacteria under cultivations, and their aspect and size in microscopic specimens. This species of bacillus is composed of motile cylindrical rods, which, cultivated in gelatin, liquefy this, and produce in it a peculiar greenish fluorescent colouring; on agar they also produce this colouring. The nature of the young colonies in plate cultivation, their manner of spreading and swarming, are well shown in these photographs.

### *Chromogenic and Phosphorescent Bacteria.*

Time does not permit of more than a passing allusion to those remarkable species of chromogenic bacteria which have the power to produce pigments, either pigments which become dissolved in the medium in which these bacteria grow, or remain limited to the substance of the bacteria themselves. Species of bacteria there are which produce pigments of scarlet red, orange, yellow, yellow-green, green, greenish-blue, blue, violet, or pink colour. The nature of these pigments and the meaning and object of their formation are still shrouded in a good deal of mystery, though Erdmann and Schrötter showed long ago that many points of similarity exist between some of these pigments and certain aniline colours. I show you here cultivations of some of those chromogenic bacteria, and in a diagram the spectrum of one species, viz., of the *Bacillus prodigiosus*; this is the more common of the chromogenic bacteria, being occasionally present in water and in air. The pigment is soluble in alcohol, though only to a limited degree, and when the spectrum of such a solution is examined, it is seen to present a characteristic absorption-band in green; the spectrum of a watery distribution of these bacteria shows two bands: one narrow one in green, the other broader in greenish-blue; both are less deep than the single band of the alcoholic solution.

Nor have I sufficient time to do more than allude to another remarkable group of bacteria, which comprises several species, all having the power to produce luminosity of themselves and the medium in which they grow. These phosphorescent bacteria have been long known (Pflüger) to be concerned in the production of the phosphorescent condition of decomposing sea fish, but within recent times Ludwig, Fischer, Katz, and particularly Beyerinck, have studied more in detail the conditions under which these bacteria grow, and have identified and cultivated several species. Dr. Beyerinck has kindly sent me one species of these phosphorescent bacteria. The elements of this species are short oval rods, often dumb-bells; they grow in fish broth, and when the growth becomes conspicuous to the unaided eye it is luminous when viewed in the dark. I show you here some cultures which, as you see, when I place them in the dark, show a beautiful phosphorescent appearance. The phosphorescence is more or less limited to the surface layer, that is the one in contact with the oxygen of the air; in the depth it is absent, but on shaking the flask the phosphorescence appears also in the depth.

### *Fermentation.*

I have mentioned, in connection with a previous group, bacterial species which have the power to change by hydration urea into ammonium carbonate, a change which is called a fermentative action. Changes similar to these are caused by micro-organisms in many processes playing an important part in industries. Amongst these changes I may mention one in particular, the souring of milk. There are a good many others, the viscous or mannite fermentation, the butyric fermentation, the indigo fermentation, the dextran fermentation, the acetic acid fermentation, and others, but time does not permit me to describe more than one, viz., the common *Bacterium lactis*. I show you here a number of photographs of this bacterium under cultivation, and as seen under the microscope. It is a minute oval bacterium, which multiplies with great rapidity, and, introduced into milk, turns this sour in twelve to twenty-four hours at the ordinary temperature; when sterile milk is inoculated with this bacterium and kept in a warm place at a temperature of 60° to 65° F., the milk is found solid and curdled before twenty or twenty-four hours are over, and in this curdled milk large numbers of the *Bacterium lactis* are present either as dumb-bell ovals or as short chains. When a needle is dipped first into such curdled milk and then into normal milk, the same coagulation with the same appearances takes place in the latter. When a plate cultivation of such milk is made it is seen that a large number of colonies all of the same character are developed, which colonies are made up of the *Bacterium lactis*; through however numerous generations this organism is cultivated in artificial cultivations—it grows well on nutritive gelatin to which whey or only lactic sugar has been added—and if then transferred to fresh milk, it always produces this souring and curdling; that is to say, it changes lactic sugar into lactic acid, and as this is being formed it coagulates and precipitates the casein of the milk. With a trace of milk that has gone naturally sour—that is to say, to which the *Bacterium lactis* has found entrance, and in which by its multiplication it has produced curdling, any amount of normal milk can be successively turned sour and curdled. This species of bacterium is not by any means a rare organism; it is widely distributed, and can at any moment, in dairies and other places, through impurities of the utensils, by dust, etc., find access to milk which would soon succumb to its attacks; when, for instance, in dairies or in one or another locality, the milk has a frequent tendency to turn sour, this means that the *Bacterium lactis* has taken firm footing in such a locality. It is well known that only extreme measures of cleanliness, thorough boiling of all utensils and vessels, cleaning of walls and floors, can banish or reduce it. In this the analogy with an epidemic of an infectious disease is obvious. Just as in an epidemic, every susceptible individual to whom the contagion has had access becomes smitten by infection, and just as in an epidemic the contagium of the disease, being of wide distribution, and having taken a firm hold of the locality, attacks an increasing number of individuals and thus causes the epidemic—so also in the case of the *Bacterium lactis*; when this has taken a firm hold of, and has acquired a great distribution, in any locality, any sample of milk (*i.e.*, susceptible individual) may take the infection, either by coming in contact, directly or indirectly, with a trace of the milk already infected, *e.g.*, by being placed in vessels in which infected milk has been kept previously, or becoming affected through dust charged with the bacterium, or coming in contact with water poured from a vessel in which traces of the microbes are still left. All this finds its complete analogy in the case of an epidemic infectious disease. The fermentative processes due to microbic activity, and playing an important part in industries (alcoholic and other fermentations), illustrate in a very striking manner some of the essential features observed in the nature, in the production, and in the spread of infectious diseases in man and animals. The fermentative processes, thoroughly established as being due to microbic activity by the researches of Pasteur, were by Pasteur, and others after him, used as illustrations of the way in which infectious disorders in man and animals arise, and it was exactly these considerations which led Pasteur to his brilliant studies of these diseases, the results of which studies have been of such signal service in sanitary science in general, and in the prevention of infectious diseases in particular.

In the fermentative processes studied by Pasteur and others it was shown that each specific fermentative process is due to the growth and multiplication of a specific microbe. Just the same is the case with the infectious disease—when from a substance which is in the process of fermentation, a trace containing the particular microbe is introduced into fresh fermentable substance, this latter undergoes the same fermentation; further, it is shown that, however great the number of accidental non-specific bacteria which may be introduced at the same time, unless that particular bacterium be present amongst them, the specific fermentative change does not ensue. The same is the case with infectious diseases. The number of non-specific bacteria in water, dust, air, various common articles of food, etc., is sometimes great, but no amount of these would set up any of the infectious diseases, like cholera or typhoid fever, tetanus or diphtheria; in order to do so there must be amongst them the particular microbe of cholera or typhoid fever, etc. Again, in each fermentative process the substance which is to undergo the fermentation must be susceptible of the particular fermentation: a substance that contains sugar can undergo the alcoholic fermentation, a substance that contains alcohol can undergo the acetic acid fermentation, etc. The same is the case in the infectious diseases: an individual must be susceptible to the disease, though it is not quite clearly established what the meaning of this is. Further, just as in the fermentative process the susceptibility of the substance alone is not sufficient, is only a preliminary condition, the actual infection with the specific microbe being the essential, so also in the infectious disease: in order that a susceptible individual should become the subject of the disease, it is essential that the specific microbe should be present and should find entrance into this susceptible individual. Just as little as a particular condition of the atmosphere, of temperature, etc., is capable of producing the souring of milk, so also a particular atmospheric or telluric condition, season, or other external circumstances alone cannot produce an infectious disease. What is wanted in the first place is the presence of the *Bacterium lactis* in the one, the specific pathogenic microbe in the other; atmospheric or telluric conditions may and do favour the more rapid multiplication and dissemination of the *Bacterium lactis* or other specific microbes, but without the presence of the specific microbes these processes could not take place. "Thunder in the air" could not turn the milk sour, could not make meat tainted, could not turn beer or wine sour, without the presence of the specific microbes which by their presence and multiplication produce those undesired changes in these substances; the particular condition of the air could and would increase their rate of multiplication and distribution, and therefore increase the chances of infection of these substances, and therefore a more conspicuous manifestation of the effects of the activity of those microbes, but it could not produce the microbes themselves.

### *Pathogenic Bacteria.*

The different pathogenic bacteria connected with and causing the different infectious diseases have then the power of growing and multiplying within the infected individual and through the different poisonous substances—toxins—which they therein produce, of causing the changes which characterise the particular disease.

I show you here photographs of a variety of such pathogenic bacteria, and you will see from them that both as regards the manner of distribution of these bacteria in the tissues of the infected individuals and in their morphological and biological characters in artificial cultures, most of them are sufficiently distinguished from one another, and from other non-pathogenic bacteria. In considering the general action of pathogenic bacteria we find that they may be grouped into (*a*) such as are entirely, so far as our knowledge at present goes, dependent on the living body of man or animals; these are endogenic bacteria or true parasites, for they do not appear to lead an existence independent of the living body: when, therefore, infection by them takes place, it takes place by direct transference from an infected individual to a new one; this is so in small-pox, in vaccinia, and in hydrophobia; (*b*) a second group comprises those which are capable, besides a parasitic life, *i.e.*, growing and multiplying within the animal body, of leading also an existence independent of the animal body; that is to say, they, like many other non-pathogenic bacteria, are capable of thriving in suitable materials in the outside world; such are anthrax and fowl cholera, asiatic cholera and typhoid fever, tetanus and diphtheria, and others. But also amongst these some can lead such an "ectogenic" life comparatively easily, while others do so only in a restricted sense; while, for instance, anthrax, tetanus, typhoid fever, can lead such ectogenic life easily, *i.e.*. growing and multiplying outside the animal body; others, like tubercle and glanders, do so only to a very small extent. The former are obviously the more dangerous to man and animals on account of their more ready distribution than the latter, of which the ectogenic existence is considerably restricted by various conditions, *e.g.*, they require higher temperatures to grow at, and they require a much more specialised nutritive medium than is generally attainable by them.

Time does not permit me to show you in detail the many and wonderful results obtained within a comparatively short recent period by a large number of workers, as regards the identification of many of the pathogenic bacteria, their habits of life, their mode of spread and infection, the way in which their action can be attenuated, the effects weakened, and such weakened cultures used for protective inoculations; the brilliant results achieved by Pasteur and many others in these protective and curative inoculations against anthrax, against fowl cholera, against tubercle, against hydrophobia, against tetanus and other diseases. But I will ask you to bear in mind that almost the entire study of bacteria, the exact methods first introduced by Koch and now universally used not only in regard to pathogenic bacteria, but in all other branches of bacteriology; the exact knowledge that we possess of some of the most important branches of hygiene: as the knowledge of the exact nature of contagium, its mode of spread, the means of disinfection, the methods of protective inoculation, and a hundred and one other important points have been the result of, and gained by, experiment on animals. Amongst the wilderness of misery, cruelty, and death inflicted by mankind on animals for gain, for sport, pleasure, and other similar objects, to decry, as some do, the use of a comparatively few animals for the sake of gaining knowledge of the most important and complex phenomena of life and of disease, and of securing power to apply this knowledge in the interest not only of mankind, but of the animals themselves, is apt to make one remember the words: "Ye blind guides! which strain at a gnat and swallow a camel," or the words, "Thou hypocrite! cast out first the beam out of thine own eye, and then shalt thou see clearly to pull out the mote that is in thy brother's eye."

## Reviews and Notices of Books.

### PHARMACOPŒA DANICA, 1893.*

After an interval of twenty-four years a new issue of the Pharmacopœia of Denmark was published in May. Contrary to previous custom it is no longer written in Latin, but in the national language, conformably with the practice now adopted in this country as well as in Germany. For foreigners who may have occasion to refer to the work this will be some disadvantage, as a knowledge of Danish is not commonly possessed. Latin names are still retained, however, for the articles included in the Pharmacopœia, in order that physicians' prescriptions may still be written in Latin. Very few formulæ are given for chemical preparations, and it is therefore to be inferred that they may be purchased from manufacturers on the large scale. Among those retained are æther chloratus, citras ferricus c. chinino, chloretum amido-hydrargyricum, chloretum ferrico-ammonicum, hydratocarbonas ferrosus saccharatus, kermes, nitras amido-hydrargyricus c. hydrargyro, sapo medicatus, and solutio subchloreti ferrici.

Among the newer chemical preparations introduced into the Pharmacopœia are acetanilide, gallic acid, lactic acid, ammonium bromide, sodium bromide, precipitated calcium carbonate, lithium carbonate, chrysarobin, citrate of iron and quinine, butyl chloral hydrate, salicylate of sodium and caffeine, salol, and sulphonal.

A prominent feature of the work is the attention given to the testing of chemicals, the detailed directions for which are very full, and the tests to be applied are generally stringent. Though pharmacists are not bound to make the chemicals they use they are held to be responsible for the purity of those purchased. With this object in view each pharmacy is required to have a fully equipped laboratory suitable for conducting analytical operations by the gravimetric as well as the volumetric methods. It must be furnished with appliances for taking melting points and boiling points, with a microscope, and the requisite standard solutions.

Ether is directed to have a specific gravity of 0·720. Distilled water is always to be used unless otherwise directed, and when common water is used it is to be first boiled and then filtered. In making decoctions or infusions distilled water is to be used.

The aromatic waters which are to be distilled are aqua sambuci, aqua cinnamoni spir., aqua chammomillæ, the others are mixtures of essential oils with water.

Extracts are to be made by percolation. The extracts of belladonna and of henbane are to be ascertained to contain the respective alkaloids, but no quantitative tests are given.

A number of fluid extracts have been introduced, including those of cinchona, digitalis, *Rhamnus frangula*, gentian, hydrastis, ipecacuanha, quassia, *Rhamnus Purshianus* and ergot. The fluid extracts of digitalis and of ipecacuanha are so prepared that they form a clear solution with water, and the infusions of these drugs are allowed to be prepared with fluid extracts instead of infusing the drugs with hot water.

Lead plaster is to be prepared by boiling litharge with rape oil instead of olive oil, and the glycerin formed is to be entirely removed from the plaster. Rape oil is also to be used in the preparation of linimentum ammoniacatum camphoratum.

Ointments are to be made with benzoated lard, in the preparation of which Siam benzoin is to be used.

Tinctures are to be made by maceration at a temperature ranging between 15° and 25° C.

The chief points in regard to which alterations have been introduced with the object of improving the practice of pharmacy are the following:—

The formulæ of all preparations are stated in relation to a unit of one thousand parts.

Chemical products and galenical preparations subject to the influence of light are directed to be kept so that they may not undergo alteration in that way—either by using vessels of orange-coloured glass or porcelain, etc., or by storing them in a dark place.

Definite standards are given for the degrees of subdivision to which powdered and comminuted drugs are to be reduced.

The maximum doses of all potent medicinal agents are stated, not only as regards their administration at one time, but also as regards the quantities to be administered within twenty-four hours.

In the case of a number of the more important liquids the number of drops making one gramme in weight is stated, and drops are to be measured with a normal drop counter on the French system, one gramme of distilled water being equal to twenty drops.

All poisonous drugs and chemicals are to be kept in vessels the labels of which are marked with three crosses—XXX.

A register is to be kept of official drugs and chemicals, and of all the compounds into which they enter as ingredients.

The number of official drugs amounts to about 140, including several new additions, among which are condurango bark, *Rhamnus Purshianus*, and the rhizomes of hydrastis.

Directions are given for the quantitative determination of alkaloids in opium and in cinchona bark.

Opium is to contain from 10 to 12 per cent. of morphine when dried and powdered, and in cases where the drug contains a larger amount, starch is to be added in sufficient quantity to bring the powder to that standard. Laudanum and other preparations of opium are also to contain fixed amounts of morphine.

*Cinchona succirubra* is adopted as the official cinchona bark, and it is to contain 4 per cent. of mixed alkaloids, of which one fourth part is to be quinine.

Bitter almond water (conc.) is to contain in one thousand parts one part of hydrocyanic acid.

Jalap tubers are to contain at least one per cent. of jalap resin.

In every Danish pharmacy a supply of ice is to be kept, but no tests are given for ascertaining its purity.

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* Copenhagen: H. Hagerups. Pp. i-iv., 1 to 501.

## Obituary.

Notice has been received of the death of the following:—

On the 6th of June, Francis George Harris, Chemist and Druggist, late of Liverpool. Aged 44.

On the 13th of June, Charles Alfred Simpson, Chemist and Druggist, Hackney. Aged 37.

On the 14th of June, Henry Thompson, Chemist and Druggist, Tottenham. Aged 62.

On the 16th of June, Evan Thomas Evans, Chemist and Druggist, Pembroke Dock. Aged 41.

On the 19th of June, Mayall Wade, Chemist and Druggist, Oldham. Aged 53.

On the 26th of June, Henry Edwards, Chemist and Druggist, Broughton-in-Furness. Aged 58.

On the 28th of June, Richard Mullock, Chemist and Druggist, late of Charing Cross, Birkenhead. Aged 65.

On the 29th of June, Walter Fox Steer, Chemist and Druggist, Reigate. Aged 46.

On the 2nd of July, Frederick Cole, Chemist and Druggist, Congleton. Aged 63.

## Correspondence.

**** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### THE BENEVOLENT FUND ELECTIONS.

Sir,—It is not often that I trouble you with a contribution to the correspondence columns of the Journal, and I would not do so now had I not discovered in Mr. John Hick (the writer of a letter in your last issue) a very good friend, who, having found that I had "gone wrong" in "one" important particular, sought, with most benevolent intentions, to set me right. I wish to thank him most cordially for his criticism, and for the opportunity he affords me, in my reply to him, to ventilate the subject upon which we differ. Mr. Hick is in favour of the plan now in vogue of electing annuitants, and he deprecates the method I have foreshadowed more than once on the Council. But I venture to think that he is a little unfortunate in the way he illustrates the superiority of the present plan of election. He endeavours to make it clear that it is necessary to have "a friend at court" to ensure the election of an annuitant, and he describes how a few years ago "the youngest applicant, and the last to apply, without any exceptional circumstances to recommend him, came out at the top of the poll." He further observes that "should I attain my object, the unknown and friendless applicant will stand a poor chance of ever being elected." He also describes how the "touting for votes is done," and how the money is "cheerfully" spent in post cards by the "friend at court." I am disposed to think that Mr. Hick himself is not quite satisfied with the mode of election employed by the Pharmaceutical Society, as well as by many other benevolent institutions; for in relation to the matter he refers to the "sentiment in the average Britisher," and I presume he classes the members of our Society and others who vote in this category—as being one "of vanity, or something more contemptible." Mr. Hick's estimate of the "average Britisher" may be an accurate one. I am, however, disposed to think that this semi-enlightened being is open to the appeals of argument and reason, and to the claims of generous feeling and true benevolence. In early days it was considered just and right for the man who sought a wife to steal her, but this time-honoured ill practice of the past has been given up for a more reasonable and refined method of matrimony. The "average Britisher," it is said, is thrilled with delight at the sight of a good set-to, without the soft medium of gloves, when two strong men of about equal weight are engaged in fight. The scene may not be very shocking. But when our annual Benevolent Fund election fight takes place, among a number of old and suffering men and women, who have fallen by the wayside in the strife of life, the excitement of the unseemly contest ought surely to bring a blush of shame to our cheeks, and expressions of sorrowful deprecation. The plan I wish to be adopted would not only prevent a cruel and wholly unnecessary contest, but would also put an end to "the touting for votes," as well as the gross unfairness of candidates with notable and influential friends gaining their election by undue influence, leaving the helpless more helpless still. I would call to the aid of the Benevolent Fund Committee a few trusty members of the Society, chosen by the annual meeting, to select, after full and most complete inquiry and consideration, the annuitants of the year, the Council having first accepted the chosen list. Let us try to rid ourselves of the evils of the "monster custom," and be not afraid to trust the intelligence and kindness, as well as the loyalty of the subscribers to the Benevolent Fund. I am persuaded that it is safe to do so, and that the result of the new method would cause no diminution of the revenue of the Fund, neither would it cast a chill of selfishness upon the hearts of the subscribers and donors.

*London.* ROBERT HAMPSON.

### MECHANICAL STIRRER.

Sir,—It is evident that there is little probability of agreement between Mr. Moss and myself as to the respective merits of the suggested improvement to his mechanical stirrer. I am strongly disposed to regard a mechanical stirrer as imperfect that is incapable of carrying evaporation down to the thick extract stage. This operation is conducted daily in several laboratories merely by the substitution of metal for wooden stirrers and occasional attention to the sides of the pan to prevent burning. This replacing of the intelligent man with his unintelligible figures is, of course, impossible with Mr. Moss' apparatus, as at present constructed. He willingly admits this, but fails to appreciate that this is a deficiency inherent to the gut-band arrangement. The principal advantage of this arrangement is that the initial cost is less. But whilst this is important it is almost an axiom in mechanical engineering that economy in apparatus is purchased at the expense of efficiency. I should not have again troubled your readers in the matter, knowing how few can be interested in the question, but for the sceptical tone of the last paragraph in Mr. Moss' reply. Surely Mr. Moss is aware that stirrers are not infrequently made of metal, even in pharmaceutical laboratories, and in the instance I mentioned they were made of cast gun-metal, so there was not much to fear regarding their "tenacity." My letter indicated also that it was a thick extract that was concerned and no "liquor" at all. I am quite content now to leave the question at issue to the judgment of those who have experience in these matters, whilst fully appreciating the courteous manner in which Mr. Moss has met my suggestion.

*London.* E. J. MILLARD.

Copies of the following newspapers, with marked paragraphs, have been received:—*Birmingham Daily Post, County Herald, Durham County Advertiser, Southport Guardian.*

COMMUNICATIONS, LETTERS, etc., received from Messrs. Calvert, Christy, Gill, Hart, Hornby, Laurie, McKellar, Ransom, Williams.

# ARROW POISONS OF THE GENUS ACOKANTHERA.

BY E. M. HOLMES, F.L.S.,

*Curator of the Museums of the Pharmaceutical Society of Great Britain.*

## 1. WANIKA ARROW POISON.

In a previous communication (*Ph. J.*, [3], xxiii., 965), *Acokanthera Schimperi*, Benth., was suggested as the probable source of the African arrow poison known as Wabei, Ouabaio, or Wabajo. It appears that other arrow poisons are also prepared by certain tribes from species of the same genus. In a paper published by Mr. A. W. Gerrard on Wanika arrow poison (*Pharm. Journ.*, [3], vol. xi., p. 833), it is mentioned that the poison used by the Wa-nika and Wa-kamba tribes who live to the west of an island called Mombassa, between Zanzibar and Somali Land, is obtained from several roots. Nevertheless, Mr. Gerrard considers that the poison is derived from the genus *Strophanthus*, of which the seed is the part generally employed as a poison. The grounds on which he does so are that the action of the poison resembles that of *Strophanthus*, and that the poison contains a glucoside, like strophanthin. But it recently occurred to me, on reading carefully through M. Arnaud's account of the properties of ouabain, that this glucoside offered no good colour test like that mentioned for strophanthin by Professor T. R. Fraser. On comparing the action of concentrated sulphuric acid on the strophanthin, ouabain, and wanikin in the Museum of the Society, I found that the wanikin did not give the same characteristic green colour as strophanthin, but resembled ouabain. It is therefore evidently not derived from the official species of strophanthus. It does not, of course, follow that Wanika poison is not derived from some other species of strophanthus, since ouabain has been found in the seeds of *Strophanthus glaber*, Max. Cornu, MS., and most likely occurs in some other species. The fact that a root is used in preparing the poison seems, however, to render it more probable that a species of *Acokanthera* is the source of it.

In a paper by Professor T. R. Fraser, read before the Royal Society in London, on March 23, and reproduced recently in the *Pharm. Journ.* (see vol. xxiii., p. 937), on the arrow poison of the Wa Nyika tribe, the same conclusion is arrived at, the author stating that he has received the leaves and fruit of the plant, which have enabled him to identify it as an *Acokanthera*. In the absence of flowers, however, he does not assign it to any particular species. From the poison he has obtained a crystalline glucoside,* the method adopted being to prepare an alcoholic extract of the wood, treat the alcoholic extract with water, and evaporate the filtered watery solution. Impure crystals appear in the concentrated solution, and their purification is effected by digestion of a hot alcoholic solution with charcoal and subsequent crystallisation from hot rectified spirit. When crystallised from spirit the glucoside is obtained in the form of colourless needles arranged in tufts and rosettes, but from water in quadrangular plates. Ether, chloroform, and petroleum ether precipitate the active principle from solutions in strong and dilute alcohol. At a temperature between 55° and 60° F. the crystals are soluble to the extent of about 0·93 per cent. in distilled water, of 0·41 per cent. in absolute alcohol, of 0·45 per cent. in diluted alcohol of sp. gr. 0·838, of 2·4 per cent. in diluted alcohol of sp. gr. 0·920. They are less soluble in acetone, amyl alcohol, and petroleum ether, and are altogether insoluble in ethyl ether and chloroform. Much larger quantities are dissolved by hot than by cold water and alcohol. Ether, chloroform, and petroleum ether precipitate the active principle in a crystalline form from solutions in strong and dilute alcohol. A saturated solution in cold water is tasteless and neutral in reaction, and is not perceptibly affected by the ordinary reagents for alkaloids and other chemical reagents. Silver nitrate and mercurous nitrate, however, produce white precipitates. Tannin does not cause any change in saturated cold water solutions, but throws down a copious white precipitate in cold solutions prepared by saturating water at the boiling temperature, and this precipitate is soluble in an excess of the reagent and in water. When to the crystals themselves a little strong sulphuric acid is added a pink colour is almost immediately developed, which soon darkens to a brick-red, and then slowly fades to pale brown. Dilute sulphuric acid, with moderate heat, changes the colourless crystals rapidly to brick-red, and gradually to chocolate and green. Two concordant combustions, made by Dr. Dobbin, of the Chemical Laboratory of Edinburgh University, indicate that the probable formula is $C_{30}H_{52}O_{14}$.

The crude arrow poison was found to have only one-sixth the strength of the glucoside. Professor Fraser remarks further that these characters show that the active principle closely resembles, if it be not identical with, the ouabain of Arnaud. The formula given by Arnaud differs slightly from that of Dr. Dobbin, viz., $C_{30}H_{46}O_{12}$, that of strophanthin being $C_{31}H_{48}O_{12}$. The action of the glucoside obtained by Professor Fraser upon the circulatory, muscular, and nervous systems is stated to closely resemble, if it be not identical with, that of strophanthin. No mention is made by Professor Fraser of the bitterness of the wood alluded to by M. Arnaud, although his glucoside, like ouabain, is practically tasteless; nor does M. Arnaud appear to have further investigated the cause of the bitterness.

Another arrow poison certainly derived from a species of Acokanthera is:—

## 2. THE TAITA, TEITA, OR SWAHILI ARROW POISON.

A few months ago some packets of the "Taita" arrow poison were presented to the Museum of the Pharmaceutical Society by the Rev. Horace Waller, together with a portion of the root, from which the poison was prepared, obtained by Consul Holmwood, in February, 1888. On examining this root I noticed that it presented the appearance already described by M. Cathelineau as characteristic of the genus *Acokanthera*, and on examining the species of *Acokanthera* in the Kew Herbarium, I found two specimens of the leaves of the plant yielding the Teita, received from Consul Holmwood February, 1888, by the Foreign Office, and referred at Kew to the genus *Acokanthera*.

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* Mr. Gerrard did not succeed in preparing crystals of wanikin, nor was Professor Fraser able to obtain it crystallised by the tannin and oxide of lead process.

These had been sent as the source of the Taita arrow poison, and were collected on the "N'dara Mountains, Taita," East Tropical Africa. Both of these possess the numerous veins characteristic of *A. venenata* and *A. spectabilis*, but the one presents the distinctly reticulated appearance and prominent veinlets of *A. venenata*, and the other the less prominent veinlets of *A. spectabilis*. Neither is in flower.

Another specimen in the Kew Herbarium collected by the traveller Hildebrandt (No. 2452), in February, 1877, is also labelled "N'dara Mountains, Taita, vernacular name M'tchungu," and the bark of it is said to be employed by the Ki-teita and Kiswaheli (Taita and Swahili tribes) as an arrow poison, a decoction being made from it. This specimen is also without flowers, and presents the same appearance as the leaves of *A. venenata*. Hildebrandt evidently did not consider this plant (No. 2452) the same as the one that he calls Wabajo (No. 1431), since he does not make any allusion to the one on the label of the other. These specimens are interesting from the point of view of geographical distribution of the species. In Bentham and Hooker's 'Genera Plantarum' *A. venenata* and *A. spectabilis* are stated to be natives of Southern Africa and *A. Schimperi* of Abyssinia, but in the Taita plants we have an apparent extension of the first two species northward to E. Tropical Africa. In a specimen collected in March, 1885, by Messrs. Thrupp and James in Somali Land[*] (see 'The Unknown Horn of Africa,' p. 317) and deposited in the Kew Herbarium, which exhibits the characteristic reticulated venation of *A. venenata*, we have apparently a still further extension northwards of this species, or of a form closely related to it, for the leaves are more ovate than is usual in *A. venenata*. There is also in the same Herbarium a specimen collected in Arabia, sixty miles north of Aden, by Captain L. Hunter, which apparently belong to *A. Schimperi*. There is, therefore, sufficient evidence to assume that the Taita arrow poison is prepared from species of *Acokanthera*, which are either identical with or closely related to *A. venenata* and *A. spectabilis*, and that these species, possibly in one or more forms, extend further north than has hitherto been supposed.[†]

### 3. WA-KINGA, WA-KAMBA, OR MURJU ARROW POISON.

In the Kew Herbarium there is a specimen of a species of *Acokanthera* labelled "Murju, Lykopia, 6–8000 feet, Masai Country, J. Thompson, Sept., 1884. The hunting tribes, Wa-kinga and Wa-kamba, extract a deadly poison from this plant." The specimen is not in flower, but has leaves closely corresponding in the characters already described with those of *Acokanthera Schimperi*, *ante*, p. 965. It would seem, therefore, that all the species of this genus are employed in different districts in Eastern Africa as arrow poisons.

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## CANAIGRE TANNIN.[*]

BY HENRY TRIMBLE AND JOSIAH C. PEACOCK.

About four years ago, a paper by one of us[†] gave some account of the possibilities of canaigre becoming a valuable source of tannin. Lack of material prevented the further investigation of the tannin, until last year, when a liberal supply was received from Mr. Charles B. Allaire, of Peoria, Illinois, who, as President of the Tanning Extract Company, of Deeming, New Mexico, was able to furnish samples of the roots of different ages.

It may be recalled that this canaigre is the tuberous root of *Rumex hymenosepalus*, a plant growing abundantly in the sandy soil of Texas, New Mexico, and Arizona. The roots vary much in size and appearance, according to whether they are green or dry. A number of green roots were received September 14, 1892, from Professor C. B. Collingwood, of the University of Arizona, who furnished the following interesting information: "It is impossible to make a satisfactory division into roots one, two, and three years old from wild plants. Differences of soil, amount of water, etc., cause a wide variation in the appearance. These roots were planted in July, 1891, in our plot, which happens to be mesa soil of rather heavy gravelly loam, altogether too hard and stiff for this plant, which seems to prefer almost pure sand. They received some irrigation, but did not show above ground until October. During the winter they grew steadily, but slowly. About March 1 they started into rapid growth, which continued until flower and seeding occurred in April; seeds very sparingly, but more plentifully than in native state. The percentage of tannin has been steadily increasing. The roots now show signs of sprouting, and will be gathered and replanted. The yield from this plot was about seven tons to the acre, but on account of unfitness of soil is not a fair test. Experiments on other soils indicate that we may safely expect fifteen to twenty tons of green roots per acre. The last samples analysed, August 31, contained in green root 66 per cent. moisture at 100° C., 16·18 per cent. total extract, 11·46 per cent. tannic acid (by hide), 70·98 per cent. purity. This would show in the dry roots, which contain 8 per cent. moisture, 44·66 per cent. total extract, 31·62 per cent. tannic acid, with 70·98 per cent. purity. During the spring I travelled over the Territory collecting samples. The average from fourteen widely different parts showed (in dry root) 8 per cent. moisture, 44·7 per cent. total extract, 30·5 per cent. tannic acid, 68·23 per cent. purity. It is of great interest to us to know that the cultivated root is at least equal to the wild, and we see no reason why the percentage of tannin should not be increased by judicious selection."[*]

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[*] It should be mentioned here that *Acokanthera* is not the only plant used as an arrow poison in Somali Land. A specimen of another plant, collected by Messrs. Thrupp and James, at Darror (*loc. cit.*, p. 320), Somali Land, has been identified by Professor D. Oliver as belonging to *Adenium Somalense*, Balf. f. ('Botany of Socotra,' p. 162). The juice of an allied species, *Adenium Boehmianum*, was found by Dr. Schinz to be used, under the name of "Echuja," as an arrow poison by the natives of South-West Africa. Its glucoside, echujin, resembles digitalin in some respects (*Pharm. Journ.*, [3], xx., p. 343).

[†] A plant nearly allied to *A. Schimperi* has been found by Professor J. B. Balfour in Socotra, differing from it chiefly in the lesser degree of development of flowers and fruit ('Botany of Socotra,' p. 157).

[*] Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 122. Read at the Pharmaceutical Meeting held March 21. From the *American Journal of Pharmacy*, April.

[†] *American Journal of Pharmacy*, 1889. See *Pharmaceutical Journal*, [3], xx., 187.

Some of the green roots sent by Professor Collingwood have been growing indoors since last September, and the growth has been satisfactory. The chief object of this paper is to give the results of a more extended study of the tannin.

### *Preparation and Purification.*

Two methods of preparation were tried, one by percolation with commercial ether, and the other by percolation with cold water. The product from the ether extraction was found to be very difficult to purify from the associated yellow colouring matter, so that water was adopted as the menstruum. The diluted aqueous percolate was divided into two equal parts. One portion was completely precipitated with lead acetate, the other was then stirred into it, and the whole filtered, whereby a yellow filtrate was obtained. The tannin in the filtrate was removed by agitation with acetic ether. By distilling off the latter under diminished pressure, the tannin was obtained as a porous yellow residue. The thoroughly dried and finely powdered tannin was treated with absolute ether to remove colouring and crystalline substance. The latter was obtained in acicular crystals, and was almost entirely protocatechuic acid. The treatment with absolute ether proved quite successful in removing the colouring, but it is obvious that the absorption of moisture must be guarded against or tannin will dissolve. The ether-washed tannin was dissolved in ether containing just sufficient alcohol to effect solution, the solution was filtered and then distilled to dryness in a partial vacuum, when a porous yellow residue remained. This was employed in the subsequent work on the tannin. Attempts were made to get rid of the yellow colouring matter by precipitation of the tannin with lead acetate and washing the lead precipitate with both water and water containing lead acetate and decomposing the precipitate with hydrogen sulphide, but several lots so treated were found to afford comparatively smaller quantities of tannin, not in any way superior to that obtained above.

It was noticed during the progress of the latter work, that if a solution of the tannin possessing a red colour was precipitated by lead acetate and the unfiltered mixture thoroughly saturated with hydrogen sulphide, upon filtering, a much lighter coloured filtrate was obtained, thus showing lead sulphate to be, under these conditions, a good decolorising agent. Some of the original water percolate was saturated with sodium chloride, the precipitate collected by filtration, dissolved in commercial ether, and the solution distilled to dryness under diminished pressure, a porous red-brown residue being obtained. It was only partly soluble in cold, but completely in hot water. The filtrate from the precipitate caused by sodium chloride was shaken with acetic ether, which removed a small amount of tannin much lighter in colour than that thrown out by sodium chloride. It was readily soluble in cold water. Another portion of the original water percolate of the root was agitated with acetic ether without previously decolorising by lead acetate. The substance removed was reddish-brown in colour. This was dissolved in commercial ether, and the solution so obtained distilled under reduced pressure in order to remove the acetic ether and render the substance porous. This residue was dissolved in water. The dense solution, upon standing in a cool room, separated a crop of yellow crystals. These were obtained, recrystallised from alcohol, in feathery forms composed of transparent yellow crystals which gave the reactions of protocatechuic acid. Upon longer standing, the watery liquid deposited more crystals, square shaped and larger than above, but owing to the difficulty of completely separating adhering tannin, these were not obtained so pure as were the first. However, from general behaviour they were suspected to be chrysophanic acid, or perhaps emodin—since the latter has been found in the root.

Another portion of canaigre was percolated with petroleum ether to ascertain if the yellow colouring matter could be removed by that solvent. Besides chlorophyll, fat, and the small amount of the yellow colouring substance removed, the crystalline principles just mentioned above were extracted. By recrystallisation, the second one was obtained sufficiently freed of fat to give the calcium hydrate and the ferric chloride tests for chrysophanic acid, which it also resembled by crystallising in a square form. The extraction with petroleum ether did not manifestly aid in getting a lighter coloured or purer tannin. All these tannins gave the same reactions as the one employed below. After these several attempts at purification, the tannin from the water extract, purified by means of lead acetate and acetic ether, as at first described, was employed for the subsequent work. This tannin was porous, yellow, readily soluble in water, and free from sugars. Upon saturating the alcoholic solution with ether it was thrown out in a plastic condition. A one per cent. solution gave the following reactions:—

| | |
|---|---|
| Ferric chloride | green ppt. |
| and | |
| Ammonium hydrate | brown ppt. |
| Ferrous sulphate | no change. |
| Lead acetate | yellowish ppt. |
| Gelatin and alum solution. | yellow ppt. |
| Tartar emetic | no change. |
| and | |
| Ammonium chloride | clouding, becoming a flocculent ppt. |
| Potassium bichromate | greenish-brown ppt., darkening. |
| Fehling's solution | reduced. |
| Ammoniacal silver nitrate | reduced. |
| Calcium hydrate | light pink ppt., turning red and brown. |
| Bromine water | first yellow, then brown ppt. |
| Ammonium molybdate | no change in colour. |

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[*] Since writing this paper, Bulletin No. 7 of the Arizona Agricultural Experiment Station has been received from Professor Collingwood. This pamphlet of forty pages is devoted entirely to Canaigre, under five headings, as follows: (1) Historical Sketch; (2) Botanical Characteristics; (3) Chemical Examination; (4) Cultivation; (5) Conclusions.

| | |
|---|---|
| Cobalt acetate.............. | yellow ppt. |
| Uranium acetate............ | crimson colour, upon standing a red-brown ppt. |
| Ammoniacal picric acid... | no change in colour. |
| Ferric acetate ............... | green ppt. |
| Copper sulphate ............ | no change. |
| and | |
| Ammonium hydrate ...... | brown ppt., liquid brownish-green. |

A portion of the solution used above gave with bromine water a yellowish precipitate, which upon collecting and washing with water became red. The washings did not precipitate silver nitrate. The filtrate was warmed to remove the slight excess of bromine. The absence of the latter in a free state having been proved by agitating with chloroform, chlorine water was then carefully added, and upon agitating again with chloroform, the latter was coloured red, showing bromine compounds to be present in the liquid. The latter was precipitated by silver nitrate, which would indicate hydrobromic acid. The washed and reddened precipitate was fused with sodium carbonate, which rendered the bromine capable of detection by silver nitrate and by chlorine and chloroform. The tannin was then subjected to the following examinations:—

### *Action of Heat.*

0·5 gramme of the tannin were heated with a few cubic centimetres of glycerin at 160° C. for twenty minutes and then raised to 190° C. for a few minutes, at which temperature considerable effervescence occurred. The mixture upon cooling was shaken with several portions of ether, sp. gr. ·725, which upon being separated and evaporated yielded a residue of small square yellow crystals. But for a small amount of resinous substance soluble in alcohol, the crystals were completely soluble in water and gave the following characteristic reactions of catechol:—

| | |
|---|---|
| Calcium hydrate............ | red colour, turning brown and gradually precipitating. |
| Ferric chloride .......... . | brownish-green colour. |
| Ferric acetate ............... | brownish-green ppt. |
| Ferrous sulphate ......... | no change, upon standing a slight blue ppt., the liquid remaining colourless. |

### *Action of Acids (Hydrolysis).*

Two grammes were boiled with 2 per cent. (absolute gas) hydrochloric acid for three hours, during which an amorphous red, insoluble substance separated. The contents of the vessel were allowed to cool, then filtered, the insoluble red substance washed with water and dried over sulphuric acid. The red filtrate was evaporated to dryness on a water-bath and the residue treated with water, which it slightly coloured. The insoluble red substance was filtered off, the filtrate shaken with several portions of ether, sp. gr. ·725, which removed a colourless crystalline substance, the ether removed from the aqueous liquid by warming, the latter cooled and precipitated by basic lead acetate, filtered, excess of lead removed from filtrate by means of hydrogen sulphide, lead sulphide separated by filtration, excess of gas boiled out of filtrate, the last made alkaline with sodium hydrate, and heated on a water-bath with Fehling's solution, when some reduction occurred. The amount of cuprous oxide obtained was less than that obtained from the ·3 gramme used, when the tannin extracted by commercial ether was acted on with the same strength hydrochloric acid. The evaporation to dryness made the red compound more insoluble in water, or, by removing the hydrochloric acid, entirely excluded it from solution. As the red substance was found to reduce Fehling's solution, it would appear probable that it caused the slight reduction observed.

### *Red Substance Produced by Action of Acids.*

This was washed thoroughly with absolute ether to remove crystalline substances. In mass it was almost black; in powder, red-brown. It was partly soluble in ammonium hydrate, sodium hydrate, sodium carbonate, and more than one-half was soluble in alcohol. The part soluble in alcohol behaved like the tannin towards ferric chloride. This was also the portion soluble in alkalies. Heated with Fehling's solution the latter was reduced. Cold concentrated nitric acid completely oxidised the portion soluble in alcohol; hot nitric acid the portion insoluble in that liquid. Upon standing in contact with water for twenty-four hours it dissolved only to an extent sufficient to colour the water reddish yellow; the residue remaining, as before, not completely soluble in alcohol. The part insoluble in alcohol dissolved sparingly in alkalies, but only upon long standing.

### *Crystalline Substance Produced by Action of Acids.*

The colourless crystalline substance removed by ether previous to treatment with Fehling's solution gave the following reactions for protocatechuic acid:

| | |
|---|---|
| Ferric chloride ............ | green colour. |
| and | |
| Sodium carbonate ......... | red colour. |
| Ferrous sulphate............ | in neutral solution, violet colour. |
| Fehling's solution ......... | no change. |
| Ammoniacal silver nitrate | reduced. |
| Basic lead acetate ......... | white ppt. |
| Neutral lead acetate ...... | white ppt., filtrate not precipitated by basic lead acetate (absence of phloroglucin). |

### *Action of Fused Alkali.*

One gramme was gradually added with constant stirring to potassium hydrate in the fused state. Effervescence occurred, and an odour resembling that produced in making soap from rancid fat was noticed (fusing alkali alone did not give this odour). The fusion was allowed to become cold and solid, when it was treated with water, which produced a clear and perfect solution. The alkali was supersaturated with dilute sulphuric acid, the slight excess of which was neutralised with acid sodium carbonate and the unfiltered mixture shaken with ether, sp. gr. ·725, which upon evaporation left a yellow residue which was destitute of sweet taste (absence of phloroglucin), almost completely soluble in hot water, the remainder dissolved in alcohol. The pale yellow water solution reacted as follows:—

| | |
|---|---|
| Ferric chloride ............ | dark green colour, changed to deep red upon adding excess of sodium carbonate. |
| Ferrous sulphate ......... | in a neutral solution, violet colour. |
| Ammoniacal silver nitrate | reduced. |
| Basic lead acetate ......... | brownish ppt. |
| Neutral lead acetate ...... | brownish ppt., the filtrate was further precipitated by basic lead acetate. |
| Fehling's solution .. ...... | no change (absence of phloroglucin). |

Pine wood saturated with the solution, dried and moistened with hydrochloric acid, turned yellowish (phloroglucin produces violet or red colour). The above reactions indicate protocatechuic acid.

### *Acetyl Derivative.*

0·5 gramme of the tannin were boiled with a few cubic centimetres of acetic anhydride for an hour. The solution was poured into a relatively large bulk of water, when the greater part of the derivative coalesced to form a plastic semi-solid, the remainder separating in an indistinctly granular form. The plastic portion was kneaded under the water and the granular portion washed by stirring. After standing over night, the coalescence had become a yellow solid. The product was collected, dried over sulphuric acid, powdered, washed well with water, and again dried over sulphuric acid. The drying was completed at from 75° to 80° C., above this temperature decomposition occurred, as was shown by the acetous odour exhaled. Determinations of the melting point were undertaken, but it was noticed that considerable variation existed. A larger quantity of the derivative was heated in a test tube on a water-bath. At about 95° C. the substance fused, decomposition taking place, in which acetic anhydride was liberated, and at 100° C. the substance became a transparent, friable, solid mass. Another portion of the derivative was boiled with water, which also caused acetous odour to be given off, but nothing was dissolved by the water which would give colour with ferric acetate. Under the influence of the boiling water the substance assumed a plastic condition, and, as would be expected, upon becoming cold it became a brittle, opaque mass. Both residues fused above 100° C. and below 120° C. The former seemed to contain more acetic acid than the latter.

The tannin was submitted to combustion with the following results:—

(I.) ·1629 gramme tannin gave ·3488 gramme $CO_2$ and ·0792 gramme $H_2O$.

(II.) ·1376 gramme tannin gave ·2912 gramme $CO_2$ and ·0652 gramme $H_2O$.

(III.) ·1815 gramme tannin gave ·3875 gramme $CO_2$ and ·0872 gramme $H_2O$.

| | I. | II. | III. | Average. |
|---|---|---|---|---|
| C .................. | 58·39 | 57·71 | 58·22 | 58·10 |
| H ...... .......... | 5·40 | 5·26 | 5·33 | 5·33 |
| O .................. | 36·21 | 37·03 | 36·45 | 36·57 |

The result of these combustions indicates that canaigre tannin belongs to a group of which the tannins from mangrove and rhatany are typical representatives.

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## DERIVATIVES OF DIGITOGENIN.

BY H. KILIANI.

The splitting up of digitonin by dilute hydrochloric acid gives rise to the formation of digitogenin, $C_{15}H_{24}O$, insoluble in water, together with dextrose and galactose. When a solution of digitogenin in glacial acetic acid is treated with chromic acid, monobasic digitogenic acid, $C_{14}H_{22}O_4$, is formed, and by further oxidation of this with permanganate solution the monobasic digitic acid, $C_{10}H_{16}O_4$, is produced.

From these facts it seemed probable that digitogenin, digitogenic acid, and digitic acid might contain in common the univalent radical $C_9H_{15}O_2$ as shown below:

| | |
|---|---|
| Digitogenin ............... | $C_9H_{15}O_2 \cdot C_6H_9O$ |
| Digitogenic acid......... | $C_9H_{15}O_2 \cdot C_4H_6 \cdot CO_2H$. |
| Digitic acid ............... | $C_9H_{15}O_2 \cdot CO_2H$. |

The investigation of these substances therefore included the determination of the constitution of the group $C_9H_{15}O_2$, and the arrangement of the atoms in the residues $C_6H_9O$ and $C_4H_6 \cdot CO_2H$. Digitic acid seemed most suitable for solving the first problem, and appropriate derivatives of digitogenic acid or of digitogenin would be best for the latter. However, digitic acid proved unmanageable for the purpose, but the mother liquor obtained in its preparation gave a better result, and ultimately the investigation of some derivatives of digitogenic acid led me to the conclusion that the assumed existence of the radical $C_9H_{15}O_2$ in digitogenin, digitogenic acid, and digitic acid cannot be maintained.

### *Action of Reagents upon Digitic Acid.*

When the acid is mixed with twenty times its weight of nitric acid (sp. gr. 1·39) at the ordinary temperature it dissolves slowly, and the solution acquires the characteristic bluish-red colour of digitalis flowers. The colour gradually disappears, more quickly when heat is applied and on dilution with water. By continuing the heating to 35° and gradually raising it to 100° oxidation takes place quietly, but besides oxalic acid only oily and resinous products are formed, partly nitrogenous, but uncrystallisable. Nitric acid of 1·12 sp. gr. acts upon digitic acid only at 100°, but the products are not more capable of being dealt with.

By hydroxylamine, boiling 10 per cent. potash solution, or sodium amalgam, digitic acid is not acted upon. Permanganate solution effects a slight reduction only when there is a large excess of potash present.

Digitic acid therefore contains neither an aldehyde nor a ketone group. It is undoubtedly a saturated compound and, having regard to the hydrogen it contains, must be a hydrogenated compound in which the carbon atoms are united in a ring. Hence it follows that digitic acid as well as digitogenin and their derivatives are closely related to the terpenes.

I had arrived at this view of the subject several years ago on the ground of an observation that was not in itself conclusive evidence of the fact. When any one of the substances in question is heated rapidly on platinum foil a terpene odour is evolved, and it is still more distinct when heat is carefully applied in a test tube, but the quantity of volatile hydrocarbon so produced is only small. Attempts to obtain compounds with less hydrogen by the methods of Wallach and Bäyer were also unsuccessful. This was likewise the case in acting upon digitic acid with permanganate and heat.

In converting digitogenic acid into digitic acid by oxidation, only 35 per cent. of the latter is obtained, and since very little carbonic and oxalic acids are formed, much substance must remain in the mother liquor. By shaking the mother liquor with ether this substance can be extracted as a mixture of resinoid acids which yield no crystallisable salts, but are very readily oxidisable. By operating upon this resinous substance with boiling permanganate solution an acid was obtained of the formula $C_9H_{14}O_4$, closely corresponding to the acid obtained by Marsh, Balliol, and Gardner from the distillation products of tribasic camphenic acid, $C_{10}H_{14}O_6$, and named by them isopyrocamphenic acid.

By the action of a boiling 10 per cent. solution of caustic potash upon digitogenic acid, $C_{14}H_{22}O_4$, two acids are formed, digitoic acid, $C_{13}H_{20}O_3$, and hydrodigitoic acid, $C_{13}H_{22}O_3$. The former preponderated in amount, and by oxidation with permanganate it yields digitic acid.

### *Note on the Preparation of Pure Digitonin.*

When the mixture of digitalis glucosides, known as pure digitalin in commerce, is dissolved in the least possible quantity of hot 85 per cent. alcohol and the solution left to cool, two distinctly different crystallisations take place. Comparatively large needles are first formed, and then compact warty masses separate in much larger quantity. But both forms consist of the same substance, hydrated digitonin, $C_{27}H_{46}O_{14} + 5H_2O$, and the difference in form is merely due to the conditions under which crystallisation takes place. The more distinct crystals are formed slowly at a temperature of 40°–45°, and the warty masses when the solution is rapidly cooled below that point. As the needle-shaped crystals are much more easily separated from the mother liquor it is desirable to keep the solution at 45° for some hours after dropping into it a few crystals of digitonin. In that way the whole may be obtained in more easily separable form, and on subsequent cooling of the liquid very little more separation of digitonin takes place.—*Archiv der Pharmacie*, 231, 448.

## ONTARIO COLLEGE OF PHARMACY.

An interesting account of the rise and progress of this institution is given in the College Calendar for the Session 1893-94, this being the fourteenth session since the foundation of the College.

In 1871, the Ontario Legislature passed a "Pharmacy Act" in response to the desires of the Canadian Pharmaceutical Society, recently formed. This Act vested all authority in a Council of thirteen members, and provided that every person in the province of Ontario who had served a three years' apprenticeship in pharmacy and acted as assistant for one year, or who had been or was carrying on business as a druggist, was entitled upon payment of a fee of four dollars to be enrolled as a member of the Ontario College of Pharmacy. The College was permitted to acquire and hold property, and to erect buildings for lecture rooms, a library, and museum, whilst the Council elected by the College was empowered to examine candidates as to their fitness to receive certificates of competency to carry on the business of pharmacy, and thus protect the public generally, and the drug trade in particular. It was not until 1882 that the Council felt prepared to undertake the training of students prior to examination, but temporary quarters were then fitted up in Wellington Street, Toronto. Mr. E. B. Shuttleworth was appointed Dean, with Messrs. Rose and Robinson to assist him in teaching. Four years later the need of greater accommodation was felt, and a site purchased in St. James Square, upon which buildings were erected and equipped during 1887 at a cost of over twenty-one thousand dollars.

As the result of further legislation it became necessary after March 23, 1889, that would-be pharmacists should register their names and give evidence, by means of an examination certificate, of a satisfactory knowledge of arithmetic, mensuration, algebra, geography, and the English language. A period of apprenticeship may then be legally commenced, and must continue for four years, after which the student is required to attend two courses of lectures, junior and senior, in pharmacy, chemistry, botany, prescription-reading, and dispensing, and is then eligible, if of full age, to apply for the diploma of the College. Though the junior course may be taken in any approved institution, it is requisite that the senior course should be attended at the Ontario College of Pharmacy. The power is reserved to the Council to fix and determine from time to time the curriculum of studies, so that the College can always be kept abreast of the times.

In 1891, the College building was enlarged at a cost of fifteen thousand dollars. It is now heated throughout by steam, well-lighted, and thoroughly ventilated. On the ground floor are a reading room, library, private laboratory for lectures, recreation room, store room, and cloak rooms. The council chamber, dean's room, lecture room for chemistry and pharmacy, and pharmaceutical laboratory, occupy the second floor; and a separate lecture room for botany, materia medica, and toxicology is situated on the third floor, together with the chemical laboratory, weighing and store rooms, and private rooms for the professors. It will thus be seen that the building is admirably suited for the purposes of the College.

By a statute passed by the Senate of the University of Toronto, with the approval of the Lieutenant-Governor of Ontario and Council, on January 22, 1892, the Ontario College of Pharmacy became affiliated with that body, with the privilege of one representative on the Senate. A further statute, passed on May 6, 1892, instituted a new degree of Bachelor of Pharmacy—Phm. B.—which may be obtained on complying with certain conditions, and thus the full recognition of pharmacy in its professional aspect was secured in the Dominion of Canada.

### DRAGON'S BLOOD.

In the year 1569, Monardes published his *Historia Medicinal*, etc., and of this the famous Belgian botanist Clusius published a Latin version, with notes, in 1574. The original editions are not before us as we write, but it is desirable to note the dates at which they were published. In the French edition of Monardes, the *Histoire des Simples Medicamens apportés de l'Amerique* (1619), lib. v., cap. xxiv., we find it stated, as it probably is in the first edition to which we have referred, that the Bishop of Carthage had recently brought home the fruit of the tree, whence exudes the tear (larme) which is commonly called Dragon's Blood. Now, this fruit, our author goes on to say, is every way admirable, for as soon as the rind is removed, quite suddenly a little dragon appears, elaborated with such natural artifice, that it appears as if sculptured in marble by some skilled workman. It has a rather long neck, the throat open, the backbone beset with spines, the tail long, and the feet well armed with nails. "Carthage," in Peru, is said to be the source whence the dragon's blood is derived, and its properties are described as highly astringent, and the drug is used in those cases where a medicament of that nature is required. Clusius, in a note, proceeds to describe what we now know as *Dracæna Draco*, of which a plant was raised from seed at Brussels. He describes the fruit, but he is careful to add that there was no dragon in it. Gerard, in his *Herbal* (1597), p. 1339, under the head of *Draco arbor*, the Dragon Tree, unblushing copyist that he is, gives the same figures, and a good description of the *Dracæna Draco*. The external appearance of the fruit is well described, and then it is further stated that there "is to be seene, as Monardus and divers others report, the forme of a dragon, having a long necke or gaping throat; the ridge or backe armed with sharpe prickles like the porpentine; it hath also a long taile, and fower feet, very easie to be discerned; the figure of it we have set foorth unto you according to the greatnes thereof, because our words and meaning may be the better understood." Gerard then, as Clusius had done before him, assigned the fruit with the dragon in it to what we now know as *Dracæna Draco*, although, as we have seen, Clusius is careful to say that he could not find any dragon in it. The Dracæna also offers a difficulty, inasmuch as it is a native of Teneriffe and Madeira. But Gerard is equal to the emergency, for he goes on to say of his Dragon Tree that "this tree groweth in an Iland which the Portingales call Madera, and in one of the Canarie Islands called Insula Portus Sancti, and as it seemeth it was first brought out of Affrike, although some are of a contrarie opinion and say, that it was first brought from Carthagena in Nova Orbe by the bishop of the same province." In any case the sixteenth century botanists attributed the "dragon's blood" to the vegetable kingdom, but their far-off predecessors were less metaphorical in their notions. Pliny, for instance, in his *Natural History*, book xxxiii., cap 40, says dragon's blood (which was used as a "vehicle" or as a pigment by artists) is a thick matter issuing from the dragon when crushed beneath the weight of the dying elephant. Elsewhere Pliny (book xxxv., cap. 32) speaks of India sending to Rome the slime of her rivers, and "the corrupt blood of her dragons," and this fact serves him as an illustration of a tendency which is apparent now as then. "Everything, in fact, was superior at a time when the resources of art were so much fewer than they now are. Yes, so it is; and the reason is . . . that it is the material, and not the efforts of genius, that is now the object of research." (Bohn's edition, vol. vi., p. 246.) The question to be solved is, what was the fruit mentioned by Monardes, and which contained so striking a verisimilitude to a dragon? A conventional dragon it must have been, like the effigy at Temple Bar, perhaps, for no one quite knows what a dragon was! What is known nowadays as dragon's blood is a resinous exudation used for varnish, and derived in some cases from a Palm, *Calamus Draco*, in others from a Dracæna. Now, the Palm has a scrambling stem thickly beset with spines, and its fruits are covered with hard scales turned down, and dragon-like as dragons are supposed to go, but the Calamus comes from Sumatra and Borneo, and not from Carthagena. In spite of its name, it is rather difficult to see any resemblance to a dragon in a Dracæna. Perhaps the bayonet-like leaves may have suggested the idea.—*Gardeners' Chronicle.*

### VALUATION OF IPECACUANHA.

G. Kottmayer (*Pharm. Post*) mixes 15 grammes of powdered ipecacuanha with 148 c.c. of alcohol at 90 per cent., and 2 c.c. hydrochloric acid of sp. gr. 1·12, and digests for four days at 40° in a stoppered flask, with frequent shaking. 100 c.c. of the perfectly clear liquid, cooled down to 15°, are drawn off with a pipette and mixed in a capsule with 20 c.c. of an alcoholic solution of lead acetate (1 part sugar of lead, 9 parts of alcohol at 50 per cent.); 1·5 grammes hydrate of lime are added, and the whole is evaporated down on the water-bath to the consistence of a paste. To this paste he adds 5 grammes of moderately fine glass, evaporates to dryness with constant stirring, and the readily friable residue is extracted with chloroform for ten hours. The chloroform solution is evaporated, the dried residue weighed, treated with 2 c.c. normal hydrochloric acid, and the undissolved matter (after careful washing and drying) is weighed again. The difference between the two weights shows the emetine present.—*Chemical News.*

## REPORT ON TWO SAMPLES OF "IPECACUANHA."

BY PROFESSOR JOHN ATTFIELD, PH.D., F.R.S.

1. Each sample was duly sealed in red wax, impressed "London and India Docks Joint Committee."

2. One sample was labelled as follows:—"London and India Docks Joint Committee. Ex *Tamar* and Rail. 93/447. J.F.M. No. 2. 1 Bale. 2 lbs. sample Ipecacuanha. Crutched Friars Warehouse. 29.5.'93."

3. The other sample was thus labelled:—"London and India Docks Joint Committee. Ex *Tagus* and Rail. 93/333. $\frac{\text{DV}}{\text{L.}}$ No. 59. 1 Bale. 2 lbs. sample Ipecacuanha. Crutched Friars Warehouse. 29.5.'93."

### *The "No. 2" Sample.*

4. I find this to consist of 65·7 per cent. of official ipecacuanha, and 34·3 per cent. of ipecacuanha stems.

5. The 65·7 parts of official ipecacuanha contain 1·327 parts of the alkaloidal substance known as emetine.

6. The 34·3 parts of ipecacuanha stems contain 0·648 parts of similar emetine.

7. Therefore, 100 parts of this No. 2 sample of so-called ipecacuanha yield 1·975 parts of emetine; for 1.327 plus 0·648 equal 1·975.

8. Further, a direct determination of the alkaloid in this No. 2 sample gave me 1·950 per cent. of emetine.

9. The figures in paragraph 5 show that the official ipecacuanha in this No. 2 sample contains 2·020 per cent. of emetine.

10. The figures in paragraph 6 show that the ipecacuanha stems in this No. 2 sample contain 1·890 per cent. of emetine.

11. The moisture in the official ipecacuanha of the sample amounts to 9·9 per cent.; the moisture in the stems to 8·1 per cent.; in the whole sample 9·3 per cent.

### *The "No. 59" Sample.*

13. I find this to consist of 62·6 per cent. of official ipecacuanha and 37·4 per cent. of ipecacuanha stems.

14. The 62·6 parts of official ipecacuanha contain 1·252 parts of the alkaloidal substance known as emetine.

15. The 37·4 parts of ipecacuanha stems contain 0·546 parts of similar emetine.

16. Therefore, 100 parts of this No. 59 sample of so-called ipecacuanha yield 1·798 parts of emetine; for 1·252 plus 0·546 equal 1·798.

17. Further, a direct determination of the alkaloid in this No. 59 sample gave me 1·820 per cent. of emetine.

18. The figures in paragraph 14 show that the official ipecacuanha in this No. 59 sample contains 2·000 per cent. of emetine.

19. The figures in paragraph 15 show that the ipecacuanha stems in this No. 59 sample contain 1·46 per cent. of emetine.

20. The moisture in the official ipecacuanha of the sample is practically 10 per cent.; in the stems 8 per cent.; in the whole sample 9·3 per cent.

### *Remarks.*

21. These two samples of so-called ipecacuanha contain, in round figures, two-thirds only of official ipecacuanha and one-third of ipecacuanha stems.

22. By official ipecacuanha I mean that which alone is recognised by the compilers of the British Pharmacopœia, and, therefore, that which can alone be used legally, under the Medical Acts, in the official "Preparations" of ipecacuanha, namely, true *roots.*

23. Ipecacuanha *stems* have no official value, indeed, they have no official position.

24. The 2 per cent. of emetine I find present in the official ipecacuanha of these two samples of so-called ipecacuanha is somewhat above the average proportion of emetine present in official ipecacuanha; for though still higher proportions have been recorded, a larger number of lower proportions have been published; my own analyses of other samples also point to at most 1¾ rather than 2 per cent.

25. But, in truth, nature knows no "average" proportion of alkaloid in drugs; differences in soil and climate in different places, or in the same place in different years, causing great variations. Secondly, while such an alkaloid as, say quinine or morphine, has at least fixed and definite properties, the so-called "emetine" has not yet been obtained in a sufficiently fixed and definite condition to enable us to say that it is one single substance, emetine, and nothing else; hence, analysts at present have to rely on the general alkaloidal characters of the article termed "emetine" which they extract from ipecacuanha. Thirdly, the acids and alkalies that are used by analysts attack "emetine," therefore the yield of "emetine" will only be constant when the conditions of manipulation are constant.

26. A conventional process for the assay of ipecacuanha, described with great detail and under well-recognised authority, will doubtless be forthcoming in due time if no more scientific process should be discovered. Meanwhile, if analysts were to extract with cold ammoniacal chloroform first, and hot afterwards, and conduct any evaporation at as low a temperature as possible, maximum and fairly concordant results as regards any one sample analysed by different analysts might be expected.

27. It is to be hoped that any future authoritatively enjoined "standardisation" of ipecacuanha founded on proportion of emetine will be therapeutically satisfactory, but such a position is not yet attained. Indeed, it would seem that ipecacuanha root from which all "emetine" is removed still has pharmacological value. The latter may or may not run parallel with percentage of "emetine." Meanwhile, our only guide is "emetine" estimated with all attainable accuracy.

28. We may be said to know nothing, and to be able to infer but little pharmacologically, respecting ipecacuanha *stems.* Even the estimations of "emetine" in ipecacuanha stems are too few at present to warrant generalisation as to the relative proportion of "emetine" in stem as against "emetine" in root.

29. I regret that the present state of knowledge regarding the pharmacology of ipecacuanha and its alkaloid or alkaloids or other active principles, either on the chemical or medical side of pharmacology, prevents me writing any more definite report than the foregoing. And I fear that little more can be said on the subject until the drug and its contents have been submitted to thorough original research by some agency commanding commensurate knowledge, funds, and general resources.

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JULY 15, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE QUALITY OF IPECACUANHA.

SOME weeks ago mention was made of a question raised in regard to the quality of some parcels of ipecacuanha offered for sale in the London Drug Market. Statements then made as to the amount of emetine in the drug were disputed by Mr. RICHARD BARRON and by Mr. UMNEY on the ground that the parcels in question contained considerable proportions of stem mixed with the root, which is alone the proper official drug. To settle the point in dispute authentic samples were obtained by the Drug Club and sent to Professor ATTFIELD for analysis, and by the courtesy of the PRESIDENT of the Club we are enabled to publish the report of the results so obtained (see page 48). These results do not altogether support either of the opinions that have been expressed in regard to the subject. It is shown that both of the parcels of ipecacuanha contained a considerable admixture of stem, amounting in one instance to 34·3 and in the other to 37·4 per cent. The amount of emetine in the ipecacuanha as offered for sale with the abovementioned admixture of stem is given as 1·95 in one parcel and 1·82 per cent. in the other. These are smaller amounts than the ipecacuanha was represented to contain, the difference being about 0·5 per cent., and so far the objections raised by Mr. BARRON and Mr. UMNEY are supported. The drug contains an admixture of stem, and the amount of emetine is less than it was stated to be.

But the interesting feature of these results is that they do not confirm the statements made as to the relative amounts of emetine in the root and stem of ipecacuanha. According to those statements it might have been inferred that, as a consequence of the admixture of stem, the amount of emetine in the parcels in question would not be so much as one per cent. However, Professor ATTFIELD reports them to contain, respectively, amounts higher than some authorities have stated that the root contains on the average. Moreover, on the basis of separate analyses of the root and stem, Professor ATTFIELD'S results would show that there is not such a difference, between stem and root, as has been assumed to exist in regard to the amount of emetine. In one instance that difference is 0·6 and in the other only 0·13. So far, therefore, as these results can be applied, they do not support the objection to an admixture of stem with ipecacuanha root as involving a serious reduction in the amount of emetine, for in one instance the stem appears to be, within a small fraction, as good as the root. Still, as Professor ATTFIELD remarks, the analyses of stem are too few to warrant any generalisation on this point. It is only in regard to the parcels in dispute that his results apply. The substantial objection to those parcels is the large admixture of a part of the ipecacuanha plant which is not officially recognised by the Pharmacopœia.

The conclusions to be drawn from the facts so far established are not very definite in their bearing upon the value of ipecacuanha as a drug. Leaving out of consideration any question as to the relative amounts of emetine in the root and the stem, it is suggested by Professor ATTFIELD that there is still some doubt as to the chemical individuality of emetine. There is a further important uncertainty as to its therapeutic value, and consequently a doubt whether the amount of emetine present in the drug can be relied upon as a measure of its medicinal efficacy. The methods of determination again are open to question, and the remarkable discrepancy between the results of different operators renders the whole matter still more uncertain. This is eminently one of the cases in which there is need for better knowledge of the chemistry of drugs which have the repute of being useful for medicinal purposes, and even in this latter respect there seems to be a want of positive evidence concerning ipecacuanha.

## WHAT IS VINEGAR?

THE development of synthetic chemistry appears likely to be productive of difficulties in regard to the application of the Food and Drugs Act. Already there are many substances known which would perfectly fulfil the requirements of the Act as to "nature and substance," provided the sources from which they are derived are not taken into account. The Act does not distinctly provide for that being done, but if it is to be done, as a general rule, many substances as to which there is chemically no question would not be of the "nature and substance of the article demanded," inasmuch as they are not derived from their natural sources. It would probably be considered pedantic to insist that acetic acid is not a genuine article unless it has been derived from the manufacture of vinegar, and to condemn as spurious that which is produced by the destructive distillation of wood. Public analysts have, however, approached this position by raising the question, What is vinegar? and various attempts have been made to answer it on the authority of dictionary definitions of the word. The tribunal appealed to is perhaps not the most satisfactory one that could be selected. But the drift of most of these definitions is to represent vinegar as the product of acetous fermentation of alcoholic liquids derived from natural sources, such as wine, cyder, infusion of malt, etc. So far as the decision of the question is affected by the British Pharmacopœia the answer to it is very considerably limited. That source of vinegar which is probably most entitled to respect—viz., wine—is entirely ignored by that authority, as well as other natural sources of vinegar, and the definition given is "an acid liquid prepared from a mixture of malted and unmalted grain by the acetous fermentation." However, the limitation thus established is not maintained, for vinegar of cantharides and vinegar of squill are ordered to be made with acetic acid, and that, again, is defined to be "an acid liquid obtained from wood by destructive distillation and subsequently purified."

But the question raised by the public analysts does not apply to pharmaceutical preparations. It has a wider range, and relates to the vinegar which is used for domestic purposes. In that relation, and irrespective of any particular source of origin, vinegar may fairly be defined as an impure dilute acetic acid. The substances associated with the acetic acid as the impurities in any of the different kinds of vinegar derived from natural sources give to them particular flavours and characters; but they are entirely accidental ingredients, and otherwise unimportant, while the acetic acid is in all cases the one essential ingredient, and that is the same whether it be derived from wine, malt, or wood. It appears, therefore, chemically somewhat hypercritical to attach so much importance to the accidental impurities with which acetic acid is associated in vinegar, by insisting that they must be produced by the acetous fermentation of an infusion of malt, for that is really the only reason remaining for requiring that the acetic acid should also have been so produced. It might be argued that pure dilute acetic acid would be at least as well entitled to be called vinegar as the impure article obtained from wine or malt, though it could not properly be called either wine vinegar or malt vinegar. In like manner it might be held that dilute acetic acid, suitably flavoured, should also be called vinegar, provided it contained nothing deleterious. This is the position taken by many manufacturers of vinegar, and it is the one which public analysts condemn as amounting to a breach of the Food and Drugs Act.

In the discussion that has taken place in regard to vinegar, the subject of butter has been referred to, and it has been stated that if margarine were so artfully manufactured that the analyst could not distinguish it from butter it would not follow that the two things were identical. That would certainly be correct, so far as the immediate source of the articles was concerned; but practically the statement above referred to appears to point to the desire to establish the existence of a difference where there would be admittedly no distinction. That is a position to which public analysts have very nearly been brought by manufacturers of margarine, and it appears to be a question, within measurable distance of being solved, whether mixtures of the ingredients constituting natural butter may not be artificially put together so as to furnish a material indistinguishable from the natural article, either in ordinary use or by the skill of the chemical analyst. If such a potentiality were to be realised we do not suppose the occupation of public analysts would be gone; but it is certain that, in that event, they would have to direct their inquiries in directions different from those in which they are at the present time exercised. Their disposition to assume the responsibility of deciding what should be and what should not be, appears to lead them beyond their proper function, as analysts, to an unauthorised performance of duties which would more properly appertain to a Board of Health. If the sources from which articles are derived are to be taken into account in deciding whether they are of proper nature and quality, within the meaning of the Food and Drugs Act, many difficulties would be created without corresponding advantage. If in that sense the precedent of former practice were to be rigidly adhered to, neither ammonium chloride nor saltpetre, as at present known, would bear the test, however unexceptionable they might be in regard to all the essential particulars of purity and quality, to secure which is the special object of the Food and Drugs Act.

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### GRAMMAR AND THE MEDICINE STAMP DUTY.

As will be seen by reference to our correspondence columns this week, Mr. J. A. Forret still prefers to adhere to his opinion that it is "ludicrous" for the Board of Inland Revenue to draw a distinction between "Blaud's Pills" and "Blaud Pills," rather than be satisfied with the practical advantage thus secured. His only objection apparently to the use of the latter term upon his labels is that it constitutes "a monstrosity in grammar." It may fairly be pointed out, however, that if grammatical considerations are to be allowed any weight in the settlement of the question under discussion, both literary accuracy and common sense rest with the Board. The position taken by the Board is that the use of the possessive case indicates to the average individual, if it indicates anything at all, that the production of the pills in question is in some way vested in an individual named Blaud, whereas the term "Blaud Pills" is simply a convenient abbreviation of the phrase "Pills prepared according to the formula of Dr. Blaud." As an analogous instance it is not customary to speak of steel made by Bessemer's process as "Bessemer's Steel" but as "Bessemer Steel." The name of the inventor of the process by which that particular steel is made is used simply as a distinguishing term, and the use of the possessive case in any such instance, except when a process is being worked by the inventor exclusively, would be opposed both to grammar and common sense. Apart, however, from the fact that the contention of our correspondent tends to promote verbal inaccuracies, the main point to observe is that in dealing with the Board of Inland Revenue, with its practically unlimited power, it is necessary to be thankful for small mercies and not, by constant clamouring, to afford ground for further restrictions. On the whole the Board deals very fairly with chemists and druggists, having granted many concessions, and considering that fact we would suggest that it might not be amiss if our northern friends, "letting sleeping dogs lie," were to "rest and be thankful."

## BRITISH PHARMACEUTICAL CONFERENCE.

This year, as last, the British Pharmaceutical Conference finds a resting place at a town it has previously visited. A meeting was held at Nottingham under the presidency of Professor Bentley in 1866, and it is somewhat remarkable that the President on this occasion, Mr. Octavius Corder, is also a distinguished botanist. As previously announced (see *Pharm. Journ.*, April 29, page 892), the reception will be held by the President in the Museum and Art Gallery at Nottingham Castle on Monday, August 14, at 8 p.m. This will be followed by a conversazione, with instrumental music and light refreshment. The opening meeting of the Conference takes place, as usual, on the following morning at ten o'clock. The sessions will be held in the Borough Council Chamber, Exchange Hall, and the Mayor of Nottingham will attend the opening to welcome the Conference to the town. The presidential address and reading of papers will, with an interval for luncheon at the George Hotel, occupy the time until 4 p.m., when a special train is to leave the Great Northern railway station for Redmile, whence the visitors will proceed to Belvoir Castle, the seat of the Duke of Rutland, after taking tea at the Peacock Hotel. On Wednesday, the business meeting will be followed by a visit to Wollaton Hall, the seat of Lord Middleton, carriages conveying members by way of Lenton Boulevard, across the park, to the Hall, where tea will be provided. In the evening the usual smoking concert will be held at the Exchange, at 8.30 p.m. The whole day excursion on Thursday will be particularly interesting, Welbeck, Thoresby, Clumber, and other places in the Sherwood Forest district being included in the programme, whilst the whole party is to be entertained to tea in the Town Hall of Mansfield, as guests of the Mayor, Alderman Douglas J. Patterson, before returning to Nottingham. The books of tickets are being supplied at the usual rates, and the local secretaries of the Conference are prepared to find accommodation for members on application. The town of Nottingham is very central and easy of access, as it may be reached from either north or south by the Great Northern, Midland, and London and North-Western Railways, whilst the Derbyshire health resorts are very near, and offer additional attractions for visitors who may be able to make an extended stay in the district. It may fairly be anticipated that the thirtieth annual meeting of the Conference will be no less satisfactory in its results than its predecessors, certainly in its holiday aspect, whatever may be the case from a merely utilitarian point of view.

## THE MEDICINE STAMP ACTS.

We have received a letter from Mr. Gill, of Nottingham, in which he states that the members of the local Association, of which he is the honorary Secretary, have had an interview with the members of Parliament for the borough, and represented to them their views in regard to the Medicine Stamp Acts. As a result they have obtained promises that the matter shall be brought under the notice of Sir Walter Foster and the Chancellor of the Exchequer. It is considered that the Acts do not adequately meet the requirements of business at the present time, and there is room for their amendment, especially in regard to the practice of paying informers a portion of the fines inflicted. It is also thought that Pharmacopœia preparations should be exempted from the operation of the Act, inasmuch as they are not within the spirit of the Act. We may, however, remark that these preparations are exempt unless they are recommended for the cure of disease or otherwise labelled so as to be rendered liable to stamp duty.

## DOCTORS' DRUG SHOPS.

Replying to a Glasgow correspondent, the *British Medical Journal* remarks that it can scarcely be necessary to remind him that it would be considered undignified for a member of the profession to open a drug shop in England and that, in the absence of the L.S.A. qualification, such an act might result in his incurring penalties under the Pharmacy Act. The assertion that "it is a common custom in Glasgow for practitioners to keep a drug shop selling everything" is noted with acute regret and, for the honour and dignity of the profession, it is hoped that the allegation is not founded on fact. Otherwise, it is suggested, extreme laxity would be denoted "on the part of the degree and diploma granting authorities in enforcing their disciplinary laws and vindicating the honour of the medical faculty." Judging from information furnished by pharmacists in the district in question it is to be feared that the allegation is but too surely founded on fact, and that the disciplinary laws, if sufficiently comprehensive to deal with such evils, are not properly enforced.

## DONATIONS TO THE MUSEUM.

The report made by the Curator to the Library, Museum, etc., Committee, at its last sitting (see page 52) is especially noticeable as containing a detailed statement of a large collection of specimens of essential oils and chemical products recently presented to the Society's Museum by Messrs. Schimmel and Co., of Leipzig. They constitute a very valuable and important addition to the objects of interest in the Museum, and will be very useful for purposes of reference. Messrs. Schimmel have also added to the usefulness of their gift by having a number of printed catalogues prepared in which the sources and chemical composition of the several specimens are described.

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Some of our readers will be pleased to learn that Mr. H. B. Pollard, B.A. (Oxon.), eldest son of Councillor H. H. Pollard, who is the Society's local secretary at Ryde, has obtained at the recent examination of the University of London the degree of Doctor of Science. We have also much pleasure in recording that, almost simultaneously with this degree, Mr. Pollard has been elected to a Berkeley Fellowship in Zoology at Owens College, Manchester, while his *alma mater*, Christ Church, Oxford, has re-elected him to a Dixon Scholarship for original research. Dr. Pollard, who lately returned from Naples (where he held the Oxford Biological Scholarship), is thus honourably associated with three English Universities.

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The name of Mr. Joseph Wild, pharmaceutical chemist, Osborne Road, Hyde, has been placed on the Commission of the Peace for that borough. Mr. Wild has been a member of the Pharmaceutical Society since 1853.

# Transactions of the Pharmaceutical Society.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 12th inst., the Librarian and Curator presented the following reports of donations to the Society's Libraries and Museums:—

### *To the Library in London.*

**The Rt. Hon. Sir T. D. Acland, Bart.**:
An Introduction to the Chemistry of Farming, 2nd ed., 1892.

**Messrs. Warden and Hooper, per Education Society's Press, Byculla**:
Pharmacographia Indica, part 6, 1893.

**Government Printer, Taiping, Perak, Straits Settlements**:
Perak Museum Notes, no. 1, on the Experimental Culture of Silkworms in Perak, etc., by L. Wray, jun., Corresponding Member Pharm. Soc.

**Ontario College of Pharmacy**:
Annual Announcement, 14th session, 1893-94.

### *To the Library in Edinburgh.*

**Pharmacy Board of Victoria**:
Annual Report for 1892.

**American Pharmaceutical Association**:
Proceedings, 1892.

**Proprietors of the Chemist and Druggist**:
Guide to the Preliminary Examination of the Pharmaceutical Society, by W. Dodds.

**Ontario College of Pharmacy**:
Annual Announcement, 14th session, 1893-94.

### *To the Museum in London.*

**Messrs. Schimmel and Co., Leipzig**:
Specimens of 163 different volatile oils, as follows:—

Oil of Abelmoschus.
Oil of Ajowan.
Oil of Bitter Almonds.
Oil of Amber.
Oil of Angelica Root.
Oil of Angelica Seed.
Oil of Angostura Bark.
Oil of Aniseed.
Oil of Arnica Root.
Oil of Asafœtida.
Oil of Asarum.
Oil of Balsam Copaiba.
Oil of Balsam Tolu.
Oil of Basil.
Oil of Bay.
Oil of Beech Tar.
Oil of Bergamot.
Oil of Betel Leaves.
Oil of Birch Tar.
Oil of Boldo Leaves.
Oil of Buchu Leaves.
Oil of Cajeput.
Oil of Calamus.
Oil of Camphor.
Oil of Cananga.
Oil of Canella Bark.
Oil of Caraway Seed.
Oil of Cardamoms.
Oil of Carline Thistle.
Oil of Carrot Seed.
Oil of Cascarilla Bark.
Oil of Cassia.
Oil of Cedar.
Oil of Cedar Wood.
Oil of Celery.
Oil of Chamomiles (German).
Oil of Chamomiles (Roman).
Oil of Chenopodium Leaves.
Oil of Chenopodium Seed.
Oil of Cherry Laurel.
Oil of Cinnamon (Ceylon).
Oil of Cinnamon Leaves.
Oil of Citronella.
Oil of Cloves.
Oil of Coriander Seed.
Oil of Cubebs.
Oil of Culilawan.
Oil of Cumin Seed.
Oil of Damiana Leaves.
Oil of Dilem.
Oil of Dill Seed.
Oil of Elecampane.
Oil of Elemi.
Oil of Erigeron.
Oil of Eucalyptus (six varieties).
Oil of Fennel Seed.
Oil of Galangal Root.
Oil of Galbanum.
Oil of Garlic.
Oil of Geranium (French).
Oil of Geranium (Indian).
Oil of Ginger.
Oil of Guaiac Wood.
Oil of Heracleum.
Oil of Hops.
Oil of Horsemint.
Oil of Hyssop.
Oil of Jaborandi Leaves.
Oil of Juniper Berries.
Oil of Iva.
Oil of Kuromoji.
Oil of Laurel (Californian).
Oil of Laurel Leaves.
Oil of Lavender.
Oil of Lemon.
Oil of Lemongrass.
Oil of Linaloe.
Oil of Lovage.
Oil of Mace.
Oil of Marjoram.
Oil of Marsh Tea.
Oil of Massoy Bark.
Oil of Masterwort.
Oil of Matico Leaves.
Oil of Milfoil.
Oil of Mugwort.
Oil of Mustard Seed.
Oil of Myrrh.
Oil of Myrtle.
Oil of Nutmegs.
Oil of Olibanum.
Oil of Onion.
Oil of Opopanax.
Oil of Bitter Orange.
Oil of Sweet Orange.
Oil of Orange Flowers.
Oil of Origanum (two varieties).
Oil of Orris Root.
Oil of Parsley.
Oil of Parsnep.
Oil of Patchouly.
Oil of Pennyroyal.
Oil of Pepper.
Oil of Japan Pepper.
Oil of Long Pepper.
Oil of Peppermint.
Oil of Petitgrain.
Oil of Pimento.
Oil of Pimpinella.
Oil of Pine Tar (Matsu Oil).
Oil of Pinus Pumilio.

Oil of Pinus Sylvestris.
Oil of Black Poplar.
Oil of Rosemary (French).
Oil of Rosemary (Italian).
Oil of Roses (German).
Oil of Roses (Turkish).
Oil of Rue.
Oil of Sage.
Oil of Sandal Wood (African).
Oil of Sandal Wood (Australian).
Oil of Sandal Wood (East India).
Oil of Sandal Wood (Swan River).
Oil of Sandal Wood (West India).
Oil of Sassafras.
Oil of Savin.
Oil of Silver Fir.
Oil of Snakeroot.
Oil of Snakeroot (Canada).
Oil of Spearmint.
Oil of Spicewood.
Oil of Spike.
Oil of Spikenard.
Oil of Star Aniseed.
Oil of Star Aniseed (Japan).
Oil of Storax.
Oil of Sumbul Root.
Oil of Summer Savory.
Oil of Tangerine.
Oil of Tansy.
Oil of Tarragon.
Oil of Thuja.
Oil of Thyme.
Oil of Turmeric.
Oil of Turpentine.
Oil of Valerian.
Oil of Valerian (Japan, Kesso Oil).
Oil of Vetiver.
Oil of Walnut Leaves.
Oil of Water Hemlock.
Oil of Wild Cherry Bark.
Oil of Wild Thyme.
Oil of Wintergreen.
Oil of Wormseed.
Oil of Wormwood.
Oil of Ylang Ylang.
Oil of Zedoary Root.
Specimens of forty-five organic and synthetic products as follows:—
Alantic Acid.
Anethol.
Anisic Acid.
Anisic Aldehyde.
Apiol (Parsley Camphor).
Asaron.
Benzoate of Methyl.
Benzoic Aldehyde.
Bergaptene.
Camphene.
Carvacrol.
Carvol.
Cinnamein.
Cinnamic Acid.
Cinnamic Alcohol.
Cinnamic Aldehyde.
Cinnamic Ether of Methyl
Citral.
Cumarin.
Cuminic Acid.
Cuminol (Cumin Aldehyde).
Cymol.
Dextro-Borneol.
Lævo-Borneol.
Eucalyptol (Cineol).
Eugenol.
Fenchon.
Furfurol.
Geraniol.
Helenin.
Heliotropin (Piperonal).
Isobutyl Mustard Oil.
Limonene.
Menthene.
Menthol.
Menthone.
Patchouly-Camphor.
Safrol.
Salicylate of Methyl.
Salicylic Aldehyde.
Stearoptene (from Oil of Roses).
Terpineol.
Terpineol (crystallised).
Thymochinon.
Thymol.

**Dr. F. Pfaff, Brnian, Bohemia:**
Specimen of Timboin, anhydro-timboin, and a bromo-derivative of the latter; also a compound formed by the action of bichloride of mercury on Tamacoaré balsam.

**Dr. B. H. Paul:**
Specimen of false Senna, consisting of the leaflets of *Pistacia Lentiscus.*

**Professor Dr. E. Schaer:**
Leaf of the Jaborandi plant cultivated in the Botanic Garden at Strassburg.

**Mr. Thos. Hanbury, F.L.S:**
Portrait of the late Daniel Hanbury, F.R.S.

**Mr. J. Piquet, Jersey:**
Cultivated specimen of *Pyrethrum cinerariæfolium.*

*To the Herbarium in London.*

**Rev. H. E. Fox, Durham:**
Specimen of *Corallorhiza innata*, *Epipactis palustris*, and *Pyrola rotundifolia.*

**Mr. W. Moore, Felstead:**
Specimen of *Camelina fœtida.*

**Mr. P. H. Marsden, Manchester:**
Specimen of flowers of *Eucalyptus globulus*, and specimen of *Artemisia glacialis.*

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## SCHOOL OF PHARMACY EXAMINATION QUESTIONS.

*Session* 1892–93.

### PRACTICAL BOTANY.

PROFESSOR GREEN.

EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

*Friday, July* 7.—*Hours from* 10 *to* 1.

1. Make longitudinal and transverse sections of the tissue provided, to display to the best advantage the structure of resin ducts.

Leave a sketch of your preparations.

2. Identify and briefly describe the three microscopic preparations, A. B. C.

3. Refer the flowers D. E. F. to their natural orders, giving briefly the reasons for your assignment.

### BOTANY.

PROFESSOR GREEN.

EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

*Monday, July* 10.—*Hours from* 10 *to* 1.

*Only three Questions to be answered.*

1. Trace briefly the degree of development of the oophore generation in a series of forms ranging from the mosses to the flowering plants.

2. Give a concise account of the effects produced on the development of the plant body by a parasitic habit

of life. Illustrate your answer by special cases selected from the Thallophytes and from the flowering plants.

3. Taking a dicotyledonous plant, trace the course of the fibro-vascular bundles from the leaves to the roots, noting especially any changes in the relative position of bast and wood at the junction of stem and root.

4. By means of a schedule, indicate the differences between the following natural orders and the marks by which each can be recognised:—Papaveraceæ, Violaceæ, Malvaceæ, Rosaceæ, Cucurbitaceæ, Labiatæ, Solanaceæ, Gentianaceæ, Polygonaceæ, Orchidaceæ, and Gramineæ.

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## FIRST EXAMINATION QUESTIONS.

*July* 11, 1893.

### LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*)

I. (*For all Candidates.*) *Translate into Latin*:—

1. He gave me his brother's house.
2. Men's hands are stronger than boys'.
3. This is the girl whose book was given to me.
4. The camp was placed seven miles from Rome.
5. It cannot be denied that your friend is more wealthy than wise.

II. Translate into English either A (Caesar) or B (Virgil).

(*Candidates must not attempt both authors.*)

#### A. CAESAR.

1. Ea res per fugitivos L. Aemilii decurionis equitum Gallorum, hostibus nuntiatur. Helvetii, seu quod timore perterritos Romanos discedere a se existimarent, eo magis, quod pridie, superioribus locis occupatis, proelium non commisissent, sive eo, quod re frumentaria intercludi posse confiderent, commutato consilio atque itinere converso, nostros a novissimo agmine insequi ac lacessere coeperunt.

2. Locutus est pro his Divitiacus Aeduus; Galliae totius factiones esse duas; harum alterius principatum tenere Aeduos, alterius Arvernos. Hi quum tantopere de potentatu inter se multos annos contenderent, factum esse, uti ab Arvernis Sequanisque Germani mercede arcesserentur. Horum primo circiter milia XV Rhenum transisse; postea quam agros et cultum et copias Gallorum homines feri ac barbari adamassent, traductos plures; nunc esse in Gallia ad C et XX milium numerum.

*Grammatical Questions.*—For those only who take Caesar.

1. Decline, in full (singular and plural), *superioribus locis*, and *novissimo agmine*. (Paragraph 1).
2. Write, in full, the indicative perfect, and subjunctive present, of *posse* and *insequi*. (Paragraph 1).
3. Write down the comparatives and superlatives of *bonus*, *facilis*, *piger*, *parvus*, *nequam*.
4. Explain the different constructions after verbs of *fearing* and *forbidding*.

#### B. VIRGIL.

1. Imperium Dido Tyria regit urbe profecta,
Germanum fugiens. Longa est injuria, longae
Ambages; sed summa sequar fastigia rerum.
Huic conjux Sichaeus erat, ditissimus agri
Phoenicum, et magno miserae dilectus amore;
Cui pater intactam dederat, primisque jugarat
Ominibus.

2. Rex erat Aeneas nobis, quo justior alter
Nec pietate fuit, nec bello major et armis;
Quem si fata virum servant, si vescitur aura
Aetheria, neque adhuc crudelibus occubat umbris,
Non metus. Officio ne te certasse priorem
Poeniteat: sunt et Siculis regionibus urbes
Armaque, Trajanoque a sanguine clarus Acestes.

*Grammatical Questions.*—For those only who take Virgil.

1. Decline in the plural *longae ambages*, and in the singular *magno amore*. (Paragraph 1).
2. Write, in full, the indicative perfect, and subjunctive present, of *posse* and *insequi*.
3. Write down the comparatives and superlatives of *bonus*, *facilis*, *piger*, *parvus*, *nequam*.
4. Explain the different constructions after verbs of *fearing* and *forbidding*.

### ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*)

[The working of these questions, as well as the answers, must be written out in full.]

1. From 261 times £35 4*s.* 2*d.* take £9089 5*s.*, and divide the remainder by 89.

2. Reduce $\frac{1}{16}$ of 10*s.* + $\frac{1}{3}$ of 5*s.* 3*d.* + $\frac{3}{16}$ of half-a-crown to the decimal of £1 5*s.* 9*d.*

3. Simplify $\frac{(3{\cdot}2-2{\cdot}9) \times 147}{{\cdot}003 \times {\cdot}0005}$.

4. If 5 cwt. 3 qr. 18 lb. 8 oz. cost £24 7*s.* 6*d.*, what will be the price of 12 cwt. 2 qr. 14 lb. 6 oz.?

5. Divide 80 hectares of land between A, B, and C, so that A shall have 2 hectares 76 ares more than B, and C 11 hectares 12 ares more than B.

6. By selling a gallon of a liquid for 21*s.* I gain $\frac{3}{16}$ of the cost. What should I gain per cent. by selling the gallon for 22*s.* 6*d.*?

7. A person sells £530 Three per cent. Stock at 86, and invests the proceeds at 3¾ per cent. What is the alteration in his income?

### ENGLISH.

(*Time allowed—from* 3 *p.m. to* 4.30 *p.m.*)

1. Analyse:—

> "All places that the eye of heaven visits
> Are to a wise man ports and happy havens.
> Teach thy necessity to reason thus;
> There is no virtue like necessity."

2. Parse fully:—*There is no virtue like necessity.*

3. Correct the following sentences, giving your reasons:—

(i.) Neither Thomas or William were in.
(ii.) John cannot run so quick as him.
(iii.) The view from this point is one of, if it be not, the most lovely.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—he soon found his way to the first class which consisted of boys far beyond his own years and among the more or less legendary stories which have gathered around his early boyhood such as how is joe getting on with his german oh he has finished german he is now doing anglo saxon one stands out on clear evidence

*5. Write a short composition on one of the following subjects:—

(i.) The Influence of Newspapers.
(ii.) The Exhibition at Chicago.
(iii.) Ancient and Modern Warfare.
(iv.) "Prosperity gives us friends, adversity proves them."

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* This must be attempted by every candidate.

## JACOB BELL SCHOLARSHIPS, 1893.

*Time allowed: Three hours* (11 *to* 2).

*In awarding marks the neatness and legibility of the writing will be taken into account.*

### LATIN.

1. Translate into English:—

At subitae horrifico lapsu de montibus adsunt
Harpyiae et magnis quatiunt clangoribus alas;
Diripiuntque dapes, contactuque omnia foedant
Immundo: tum vox taetrum dira inter odorem.
Rursum in secessu longo, sub rupe cavata,
Arboribus clausi circum, atque horrentibus umbris,
Instruimus mensas, arisque reponimus ignem.
Rursum ex diverso coeli, caecisque latebris
Turba sonans praedam pedibus circumvolat uncis;
Polluit ore dapes.

2. Translate into English:—

(*a*) Fiat enema. Injiciatur hora somni tertia quaque nocte, ad tres vices; dein repetatur alternis noctibus usque ad quartam vicem, si opus sit.

(*b*) Vegetabilia, brevi postquam decerpta fuerint, illis exceptis quae recentia esse oportet, leviter strata, quam citissime leni calore exsicca.

3. Give the case and government of *lapsu*, *odorem*, *aris*, *praedam*, *latebris* (Question 1).

4. Translate into Latin:—

(*a*) It is certain that we should have heard long ago of the things of which you speak if only they had happened.

(*b*) Within the city, meanwhile, there was a great tumult; the women ran to the temples of the gods to pray for mercy, the poorer people cried out in the streets that they would have peace, and that the Senate should send deputies to Caius. So deputies were sent, five men of the chief of the citizens.

### ENGLISH.

1. Parse fully:—

"O! for a blast of that dread horn
On Fontarabian echoes borne!"

2. Write a short essay on *one* of the following subjects:—

(*a*) International Exhibitions.

(*b*) Instinct in the Lower Animals.

(*c*) "All is the gift of industry; whate'er
Exalts, embellishes, and renders life
Delightful."

### ARITHMETIC.

1. Find the value of $\dfrac{3\frac{1}{7}}{7\frac{1}{3}\text{ of }\frac{3}{4}} \times \dfrac{\frac{6}{7}-\frac{1}{4}}{\frac{3}{8}+\frac{6}{7}}$ of £9.

2. The price of 1 oz. of coffee is ·458$\dot{3}$ shilling; what is the value of ·0015625 of a ton?

3. A can plant ⅓ hectare in 10 hrs. 15 min., B can plant the same space in 8 hrs. 45 min. How many square yards can they plant in 2⅓ hrs., working both together?

### FRENCH OR GERMAN.

*The candidate is at liberty to choose either French or German, and is not required to show a knowledge of both. Marks will be awarded for one only.*

#### *French.*

1. Translate into English:—

Ne vous est-il pas arrivé quelquefois, pendant une de ces longues, tristes et froides soirées d'hiver, où, seul avec votre pensée, vous entendiez le vent souffler dans vos corridors, et la pluie fouetter contre vos fenêtres; ne vous est-il pas arrivé, regardant, sans les voir, les tisons pétillants dans l'âtre, de prendre en dégoût notre climat sombre, notre Paris humide et boueux, et de rêver quelque oasis enchantée, tapissée de verdure et pleine de fraîcheur, où vous puissiez, en quelque saison de l'année que ce fût, au bord d'une source vive, au pied d'un palmier, vous endormir peu à peu dans une sensation de bien-être et de langueur?

2. Translate into French:—

Before I begin to tell you about France, I want you to stop and think what sort of a place it is. You know it is a country covered with corn-fields and meadows, with many beautiful houses and gardens, and a great many large towns and railways. France is in the part of the world called Europe, and there are several other great countries in Europe.

#### *German.*

1. Translate into English:—

In einem Felde hatte einst eine Familie von Lerchen den ganzen Sommer gewohnt. Die Jungen waren gross geworden und der Weizen zum Mähen reif. Eines Tages ging der Herr des Feldes vorbei, und das eine Junge hörte, wie er sagte: "Der Weizen ist reif; ich will meine Freunde bitten, dass sie mir mähen helfen." Als die alte Lerche dies erfuhr, sagte sie: "Wenn er sich auf seine Freunde verlässt, so haben wir noch Zeit genug und brauchen noch nicht auszuwandern." Nach einigen Tagen kam der Landmann wieder am Felde vorbei und sagte: "Der Weizen fällt aus; es ist die höchste Zeit, und morgen will ich ihn selber mähen." Als die alte Lerche dies hörte, sagte sie: "Jetzt kommt, Kinder; wir müssen auswandern, denn der Mann verlässt sich nicht mehr auf seine Freunde, sondern auf seine eigene Kraft." Damit wanderten sie eiligst aus.

2. Translate into German:—

It was early in the morning of a fine day in June when I left my father's house, in which I had spent so many happy years. The birds were singing in the trees, the dew was glistening on the grass, and the sun had already risen above the horizon. My luggage was very light. A small bundle on my shoulder and a strong stick in my hand—that was all. But in my pocket I had, as I thought, enough money to bring me to the end of the world.

### CHEMISTRY AND PHARMACY.

*Time allowed: Two hours* (3 *to* 5).

1. What is the composition of *Ferri Carbonas Saccharata*? Describe the official process for its preparation.

2. What is the law of gaseous diffusion?

3. What is the valency or atomicity exercised by nitrogen and sulphur, respectively, in the following compounds:—Nitric acid, nitrous oxide, ammonia, ammonium chloride, sulphuretted hydrogen and sulphuric and sulphurous acids?

4. What weight of water must be decomposed to yield enough hydrogen, measured at 16° C. and under a pressure of 740 m.m., to fill a balloon having a capacity of three cubic mètres?

### BOTANY.

1. Describe briefly the structure and functions of the Foliage-leaf.

2. Define the following terms:—Stomata, Glands, Cambium, Tuber, Dioecious, Decussate.

## Proceedings of Societies in London.

### CHEMICAL SOCIETY.

### STUDIES ON THE FORMATION OF OZONE.*

BY W. A. SHENSTONE AND MARTIN PRIEST.

The authors have submitted a known volume of oxygen confined in an ozone generator of the Brodie pattern to the influence of discharges produced by varying differences of potential, and have determined the amount of ozone produced by observing the change in volume by means of a mercury manometer. A full description was given of the contact breaker used, of the means adopted to measure the differences of potential, to prevent the ozone coming into contact with the mercury, etc.; in some of the experiments the discharge from an induction coil, in others that from an influence machine, was used. The following conclusions are drawn:—

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* Reprinted from the Proceedings of the Chemical Society, No. 125.

1. It is possible to obtain very fairly concordant results.

2. Provided that the path of the discharge be not too short at any point in the generator, the maximum proportion of ozone that can be produced at a given temperature and pressure is nearly independent of the difference of potential employed, provided that this be between the limits of 33 and 69 C.G.S. (electrostatic) units.

3. If the path of the discharge be very short at any point in the generator, the maximum proportion of ozone that can be obtained has an inverse relation to the differences of potential employed.

4. The rapidity with which oxygen is converted into ozone in a given ozone generator, and under given conditions of temperature and pressure, is greater when great than when small differences of potential are employed, or, in other words, a given percentage of ozone can be obtained more quickly by employing a high difference of potential than by means of a lower one.

5. The maximum proportion of ozone that is obtained in a given generator, at given temperature and pressure, is less when the number of discharges in unit of time is very great than when it is more moderate.

6. The highest proportions of ozone can be obtained (at given temperature and pressure, and if a given difference of potential be employed) by using a generator made of very thin glass and in which the inner tube fits into the outer tube rather closely, but such a generator acts very slowly if the mingling of its contents depend upon diffusion.

7. A greater proportion of oxygen can be converted into ozone in a given generator by means of a given difference of potential, the gas being maintained at a given temperature and pressure, by the action of an induction coil than by means of a "Wimshurst" or "Voss" machine.

The authors conclude from their results that the silent discharge acts by decomposing oxygen molecules into their atoms, which subsequently re-combine to a greater or less extent (according to the temperature and pressure) to form the triatomic molecules of ozone; and that ozone is not formed by the direct action of the discharge.

## THE CONDITIONS DETERMINATIVE OF CHEMICAL CHANGE.

BY HENRY E. ARMSTRONG, LL.D., PH.D., F.R.S.

Notwithstanding the large amount of evidence now placed on record that substances commonly supposed to be capable of directly interacting do so only in the presence of at least one other substance, chemists do not appear to have arrived at any clear and consistent understanding of the conditions determinative of chemical change: as each fresh case is recorded, we continue to express surprise, overlooking the fact that Faraday, in his early "Experimental Researches in Electricity," clearly foresaw what the conditions were, and that but a slight extension of his generalisations is needed to frame a comprehensive theory. The subject is of such importance that it appears to me desirable to discuss the bearing of recent observations, especially as they to some extent necessitate the modification of views that I have expressed elsewhere, and in order to attract the attention of physicists, to whom we must now look for guidance in these matters.

Eight years ago, in the course of the discussion on Mr. H. B. Baker's communication on "Combustion in Dried Gases" (these 'Proceedings,' 1885, 40), I defined chemical action as *reversed electrolysis*; in other words, in order that chemical action may take place, it is essential that the system operated on comprise an electrolyte. I then pointed out that as neither hydrogen nor oxygen was an electrolyte, a mixture of only these two gases should not be explosive; and, moreover, that as water was not an electrolyte, and it was scarcely probable that water and oxygen or hydrogen would form an electrolyte, it was difficult to understand how the presence of water pure and simple should be of influence in the case of a mixture of hydrogen and oxygen. This forecast has since been verified, the remarkable series of experiments carried out by V. Meyer in conjunction with Krause and Askenasy having clearly demonstrated that the formation of water from hydrogen and oxygen takes place at an irregular rate, and is, therefore, dependent on the presence of a something other than water—I imagine an acid impurity. But this is a consideration which has not yet received the proper attention, and it is, therefore, desirable to emphasise its importance by reference to other cases. Mr. Baker's recent preliminary note on the influence of moisture in promoting chemical action affords several interesting examples: Thus, he states that neither does hydrogen chloride combine with ammonia, nor is nitric oxide oxidised by oxygen if moisture be excluded.

In the former case, the addition of water should suffice to determine the combination, as water and hydrogen chloride together form a "composite electrolyte" (*cf. Roy. Soc. Proc.*, 1886, No. 243, p. 268); as neither nitric oxide nor oxygen, however, forms a composite electrolyte with water, in this case water alone should not determine the occurrence of change; but if by the introduction of a trace of "impurity" in addition to water the presence of a composite electrolyte were secured (however high its resistance, owing to the smallness of the amount of "impurity"), action would set in, and when once commenced would proceed at an increasing rate, as nitric acid would be formed, and the resistance of the electrolyte would consequently diminish. On this account it will be a task of exceeding difficulty to experimentally demonstrate that nitric oxide and oxygen are inactive in presence of water alone; but there can be no doubt that such must eventually be admitted to be the case, provided always that it is permissible to extrapolate Kohlrausch's observations, and to conclude from them that *pure* water is a dielectric. The gradual increase in the rate of change here contemplated corresponds to the period of induction observed by Bunsen and Roscoe in their observations on the interaction of chlorine and hydrogen; the statement recently made by Bodenstein and V. Meyer (*Berichte*, 1893, 1146) that a mixture of chlorine and hydrogen behaves irregularly on exposure to light is a valuable confirmation of Pringsheim's observations, and there is now no room for doubt that *pure* chlorine and hydrogen would be incapable of interacting. That no such irregularity is observed on heating iodine with hydrogen is not surprising, as hydrogen iodide would be formed from the very outset, and the electrolyte present would exert a minimum resistance almost at once. There is, however, a significant difference in the behaviour of the two mixtures, as hydrogen chloride should behave as hydrogen iodide, so that the problem is but incompletely solved; it may be that the one mixture was more nearly pure than the other, or it may be that the formation of hydrogen chloride from hydrogen and chlorine, under the influence of light, is dependent on the presence of some particular substance, together with water, and does not take place under the influence of any substance capable of forming a composite electrolyte with water; probably, however, the difference observed is chiefly due to the fact that only one of the actions is reversible under the conditions prevailing in the experiments.

Lastly, attention may be directed to the formation of sulphuric oxide from sulphurous oxide and oxygen, which is readily effected in presence of a catalyst, such as finely divided platinum; it cannot be supposed that the mere presence of platinum would condition the occurrence of change, and doubtless moisture is also necessary, the platinum or other catalyst but serving to promote the oxidation of the sulphurous oxide at a temperature considerably below that at which sulphuric oxide decomposes when heated. The action of surfaces generally may well be of this character, and the converse influence they so frequently exercise is probably an effect of the same order.

I have elsewhere raised the question whether there may not be a difference between actions taking place under the influence of low and of high electromotive forces—whether water, *per se*, may not be an electrolyte towards high, although not towards low, forces in the case of high temperature changes, or those brought about under the influence of the electric spark, for example. More attentive consideration of the subject has led me to think that this is not the case, and that we must treat high temperature changes such as occur and are involved in gaseous explosions in the same way as those occurring under ordinary conditions and at low temperatures. From this point of view, Mr. Baker's statement that ammonia and hydrogen chloride do not combine is of extreme importance; the formation of ammonium chloride from these two compounds apparently involves no interchange, but a mere combination of two substances each endowed with considerable "residual affinity," and there is no reason why a distinction should be drawn between such a case and that afforded by, say, *atoms of hydrogen and oxygen*, the difference being, it would seem, one of degree only; in fact, I am no longer inclined to believe that atoms are capable of directly uniting. In all cases at least one function of the (composite) electrolyte would appear to be that of providing the necessary "mechanism" whereby the degradation or discharge of the energy is effected. If this argument be sound, its logical extension involves the conclusion that *pure* gases should be dielectrics, *i.e.*, that the passage of an electric discharge through a gas like that of an explosive wave through, say, a mixture of hydrogen and oxygen, can only take place if an electrolyte be present. Hitherto but little attention has been paid to the electric discharge in gases which have been highly purified. The peculiar behaviour of Tesla tubes referred to by Mr. Crookes in the discussion on Mr. Shenstone's paper on the formation of ozone is, perhaps, explicable from this point of view—it may be that the atmosphere within the tube does not become conducting until sufficient moisture and "impurity" have been projected from its sides. It is conceivable that a similar explanation may hold good in the case of Professor Schuster's observation, that it is possible to urge a current of low electromotive force across a gas subjected to a high electromotive force in itself insufficient to cause a discharge in the gas; the atomic dissociation hypothesis put forward in explanation of the phenomenon does not appear to me to be sufficient.

Finally, the question arises, Can no line be drawn; are no two pure substances capable of combining or interacting:—For example, water and sulphuric anhydride? There is little to guide us here, but it seems not unlikely that water has special properties which enable it to act directly; moreover—perhaps because—in such cases composite electrolytes would result. Ammonium chloride, so long as it remains solid, is clearly a compound of a different order, and it may well be that compounds of this type are in no case directly obtainable from their constituents, because, under the conditions under which they are formed, they cannot behave as electrolytes.

Apparently, in all cases in which molecular aggregates are formed—as in the case of solutions—we are dealing with dissociable and dissociating systems, and it is not improbable that we may ultimately find an explanation of the mechanism of such changes in this fact. At present there is no information forthcoming whether simple electrolytes, such as fused silver chloride, for example, will condition chemical change in the way that water does—whether, for instance, silver chloride will condition the formation of hydrogen chloride from chlorine and hydrogen, so that a gas battery might be constructed of these three substances.

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## THE NATURE OF DEPOLARISERS.

BY HENRY E. ARMSTRONG, LL.D., PH.D., F.R.S.

When an electric current is passed between plates of platinum through a solution of sulphuric acid, the hydrogen and oxygen are partly retained at the surfaces—and apparently also within the plates—and under these conditions are capable of interacting, as in the well-known Grove gas battery: so that in so far as the "gases" thus circumstanced are concerned the change may be expressed by a reversible equation. This reversal constitutes the well-known phenomenon termed polarisation by physicists.

Reversal owing to the retention of hydrogen in circuit is promoted to different extents by different metals—hence apparently the varying electromotive forces of single fluid cells containing different negative plates; and when the pressure is sufficient to retain the whole of the hydrogen at the plate, it becomes total—hence it is, for example, that zinc does not dissolve in sulphuric acid under great pressure.

Various substances known generally as depolarisers are used to prevent the accumulation of products of electrolysis and the consequent reversal of the action—such as copper sulphate in the case of the Daniell cell and "nitric acid" in the case of the Grove and Bunsen cells; but whereas the action of copper sulphate is easy to understand, that of "nitric acid" offers many difficulties. As the heat of dissolution of copper in dilute sulphuric acid is a negative value (about 12,000 units), the displacement of copper by hydrogen—*i.e.*, the heat of dissolution of hydrogen in copper sulphate—is a positive value, so that not only does the presence of the copper sulphate prevent the accumulation of hydrogen, but in removing hydrogen it also serves to increase the electromotive force of the cell from about thirty-seven forty-sixths to about fifty forty-sixths of a volt. The principle underlying this is extensible even to cases in which one part of the cumulative effect of the cycle of change is a negative value. Thus, although copper has a negative heat of dissolution, it will readily dissolve in dilute sulphuric acid if it be used in place of zinc in a Grove cell, the negative heat of dissolution of copper being more than compensated for by the positive heat of dissolution of hydrogen in "nitric acid"; and it is well known that copper dissolves in many weak acids in presence of oxygen. It is easy to understand how oxygen acts in such cases, but the facts show that the effect produced by "nitric acid" is not so readily interpreted, and their consideration raises important questions of general application.

Russell and Lapraik have shown that when "nitric acid" is freed from nitrous compounds it does not dissolve silver, but that action sets in when a trace of nitric oxide is introduced, and continues with increasing rapidity as the quantity of the nitrous compound—a necessary product of the action—increases; Veley's later experiments have shown that the same is true of copper, without, however, affording any further explanation of the phenomena. Although it is not to be expected that such metals would dissolve in nitric acid even when coupled with a relatively electronegative conductor, as they have negative heats of dissolution, yet if the acid also acted as depolariser a cycle might be formed in which sufficient energy would be developed to condition change: it therefore follows that in such cases *nitric acid* does not act as the depolariser in accordance with the equation:

$$2Ag + 2NO_3H + ONO_2H = 2AgNO_3 + H_2O + NO_2H,$$

and that in point of fact the nitrous compound is the depolariser, although the nitric acid is the actual solvent of the metal, the hydrogen of the acid being virtually directly displaced by the metal with the assistance, however, of the current energy derived from its own oxidation by the nitrous compound.

But what interpretation is to be given of the behaviour of more active metals, such as zinc, magnesium, etc., which have positive heats of dissolution, and, therefore, are capable of dissolving in the pure dilute acid if coupled with a relatively negative conductor; does nitric acid in their case directly act as depolariser? If it be capable of thus acting, such metals even when uncoupled should dissolve in the pure diluted acid. It is noteworthy that when such metals are dissolved in nitric acid hydrogen is sometimes evolved. It has been suggested that this hydrogen is derived from the interaction of the metal and water, but I cannot now regard this as a probable explanation; its production serves rather to suggest a deficiency of the depolarising agent, which cannot well occur if nitric acid be the depolariser. Indeed, if nitric acid be regarded as directly active, it is remarkable that in presence of the large excess of the acid which is always present any hydrogen should escape; and also that the reduction should extend so far as it often does, and not extend merely to the formation of nitrous acid. If, however, the acid be incapable of directly acting as depolariser, and a nitrous compound be the initially active depolarising agent, it is no longer surprising that owing to the nitrous compound suffering further reduction it should be deficient in parts of the circuit, and that consequently hydrogen should escape. Why the reduction should extend so much further when metals having positive heats of dissolution are used, however, still requires elucidation.

In the case of sulphuric acid, whatever metals be dissolved in the *diluted* acid, no reduction takes place; and it is only when the concentrated and more or less heated acid is used that sulphurous oxide and other reduction products are obtained. It appears not improbable that reduction only takes place under conditions under which the presence of sulphuric *oxide* is possible, *i.e.*, that depolarisation is effected by sulphuric *oxide* and never by sulphuric *acid*, although this latter may be regarded as the actual solvent of the metal. There is at present no evidence forthcoming to show that nitric acid can dissociate into the anhydride and water, and even if such a change took place in concentrated solutions, there is no reason to assume that it can also take place in dilute solutions, and that this is the explanation of the difference between nitric and sulphuric acids. It is well known, however, that nitric acid is resolved with extreme facility into nitrogen dioxide, water, and oxygen, and that it is excessively sensitive to the action of nitric oxide—a trace of nitric acid would therefore exercise a fermentative action and condition, the formation, it may be, of nitrous acid, or—as there is no evidence compelling us to suppose that the compound represented by the formula $HNO_2$ exists—it may be of nitrogen dioxide. In this latter case, solutions of nitric acid would resemble concentrated sulphuric acid in containing a reducible oxide, and it may be that their depolarising action is initially exerted through such an oxide alone. To arrive at a clear conception of the function of acids in dissolving metals, and of the nature of depolarising agents, it would, therefore, appear to be necessary to take into account many circumstances to which hitherto but little attention has been paid.

## American Medical Association.

### PRESCRIPTIONS FROM THE PHARMACIST'S STANDPOINT.*

BY PROF. EDGAR L. PATCH, BOSTON, MASS.

Much interest centres about the bit of paper that calls for the remedy both physician and patient anticipate is to work some favourable change in the condition of health. Called *recipe*, from *recipere*, to take back, to receive, or *prescription*, from *præ*, before, and *scribere*, to write, it is well understood to be the order of the physician to the patient to obtain a certain remedy and employ it under his instructions. It is given in writing as a matter of convenience and safeguard.

The prescription interests the pharmacist from all points of view, and he has many complaints and suggestions to offer, but generally they are presented to his associates and friends rather than to headquarters, that is, to the writers of prescriptions. One complaint is they are not numerous enough, and another, they are not as numerous as they used to be. He accounts for this, in part, by acknowledging that pharmacists have so increased that there are not enough recipes to go around, but believes the weightier reason to be the growing popularity of homœopathy and the increasing number of physicians who purchase pills and tablet triturates, etc., and do their own dispensing.

Again, he complains of the narrow margin on prescriptions. He must buy a dollar's worth of pills, of tablets, of this elixir, of that syrup, of this synthetic, or that compound, to dispense fifty cents worth, and then put the residue in stock to spoil or eat its value in interest.

He claims that new remedies are ordered before he has opportunity to learn anything of their pharmacy. He does not know their solubility, their incompatibilities, or their likelihood to change.

He complains that the physician expects him to mix spirit of nitrous ether or strong alcoholic tinctures and fluid extracts with mucilage of acacia and obtain a clear mixture.

He is ordered to dissolve an ounce of chloroform in four ounces of glycerin. He is expected to mix the incompatibles, citrate of iron and quinine and potassium iodide, without a precipitate forming.

He is annoyed at being expected to put iodoform, two drachms; bals. Peru., three drachms; and glycerin, fourteen drachms, into a narrow-necked bottle in spite of the fact that it becomes solid. He is perplexed by the occasional physician fixing his charges for him. He is irritated at being asked to dispense potassium acetate, potassium hypophosphite, ammonium valerianate, and like substances in divided powders, notwithstanding they are extremely deliquescent. He frets when called upon to make a small pill containing seven grains of material.

He meditates, after sending to several stores for vinum ejusdem, upon the strange things called for by prescription.

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* Extract from a paper read before the Annual Meeting at Milwaukee, June 6, 1893.

He wishes the physician would be more careful in indicating his quantities, and avoid the query whether 1 oz. or 6 oz. should be given.

He wonders if the physician knows that ammonium carbonate, sodium bicarbonate, and other alkaline carbonates and lime water, precipitate many alkaloids, yet constantly writes for them combined with alkaloidal solutions.

He regrets being charged with dispensing a wrong product because precipitate has occurred in a mixture of diluted phosphoric acid and tincture of chloride of iron, when it was all caused by lead left on the inside of the bottle when last shotted out.

He resents being charged with lack of care in dispensing when a physician has ordered a supersaturated solution in which the insoluble residue has induced crystallisation.

He wishes the physician could understand that his fluid extracts are made by the Pharmacopœial standard and not after that of the manufacturer, and if there is a difference in colour, odour, and taste, due to difference in menstruum, *he* is right and not the manufacturer. He believes if the physician could have a year's experience behind the dispensing counter he could write better prescriptions and sympathise with his perplexities as he cannot now. And yet he tries, the best he knows how, to carry out the intention of the physician and do his duty to the public.—*Pharmaceutical Era.*

## Reviews and Notices of Books.

GUIDE PRATIQUE POUR LA DÉTERMINATION DES POUDRES OFFICINALES. Par EUG. COLLIN.*

Attention has frequently been drawn in the columns of this Journal to the increased importance which is justly being attributed to a knowledge of the histology of the official vegetable drugs and of the microscopical characters of powders prepared from them. It is with pleasure, therefore, that we welcome the little volume before us as an indication that this study is receiving the recognition it deserves from our colleagues in France. The author, M. Eug. Collin, is already well known as a contributor of numerous histological memoirs; he now furnishes us with a 'Practical Guide for the Determination of Official Powders.' The work consists mainly of a series of plates illustrating the histological characters of the simple vegetable powders of the last edition of the French Pharmacopœia. The subject matter is divided into eight sections, each of which treats of a particular class of drugs, such as roots, barks, etc. An introductory chapter deals with powders in general, and the treatment by which they may be rendered suitable for microscopical examination. Each section is also preceded by a prefatory chapter, in which the general characters of the class of drugs to be dealt with are described, and attention directed to those tissues which are likely to furnish characters of diagnostic value; these chapters cannot fail to prove of the greatest use to every student. Ninety-two powders are illustrated, and the work is published at the moderate price of four francs. The illustrations must, however, be regarded as the weak instead of the strong point of the work. In an atlas of this description, in which the letter-press is limited to the prefatory chapters and a simple enumeration of the tissues illustrated, the plates should, we venture to think, by their excellence supply any deficiency in description. Unfortunately the technical execution of the plates in question leaves in many cases much to be desired; moreover, although the magnification is not indicated, they would appear to have been drawn to different scales (*e.g.*, senna, henbane, cousso), an error which is liable to mislead a student. These, however, are but defects in technical execution. The accuracy of the illustrations, as far as we have examined them, leaves little to be desired, and we can strongly recommend the work to all who are interested in the microscopical examination of powdered drugs, with the conviction that by its careful perusal they will be more than repaid. To students a word of warning may not be misplaced; we would remind them that a thorough knowledge of the histology of each drug by patient examination of sectional and other preparations is an absolutely indispensable preliminary to the microscopical examination of its powder.

WHAT TO DO IN CASES OF POISONING. By WILLIAM MURRELL, M.D., F.R.C.P., etc. Seventh Edition.*

Since this little work was last noticed in these pages, it has increased in size by the addition of nearly sixty pages. The same convenient arrangement of the matter is retained, and the book remains, as formerly, "a model of compactness, and presents in a clear form just the information required in an emergency." There appears to have been a thorough revision since the publication of the last edition, many of the older methods of treatment are improved, and new ones are introduced. Numerous new remedies—such as antipyrin, antifebrin, cocaine, phenacetin, etc., etc.—are included in the list of drugs capable of producing toxic effects; whilst cases of chronic poisoning—including alcoholism, chloralism, the morphine habit, and plumbism—are dealt with collectively in a special section. As the author points out, the work is a purely practical one, and essentially a pocket guide. It cannot fail to commend itself to medical men and pharmacists.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### THE MEDICINE STAMP DUTY.

Sir,—I regret that the correspondence on this subject has been so meagre, and that it has been confined to Edinburgh. I anticipated that your editorial of June 17 would have induced a few of your readers throughout the country to express their opinion on the points at issue, and I would fain hope that the discussion is not to be allowed to drop. Meanwhile, with your permission, I will reply briefly to the article referred to. In my former letter I referred to distinctions drawn by the Board between such labels as "Bland's Pills" and "Bland Pills," and characterised such distinctions as ludicrous and grotesque. You ask why the chemist should insist upon calling such distinctions "ludicrous;" and if there is, as he thinks, no difference between such labels, why not rest content with the concession that is made. Now, the labels referred to, do mean the same thing. That there is no difference between them is not, as you put it, a matter of opinion, but a matter of fact; and a distinction, in the matter of liability or non-liability to stamp duty, made between two such labels may be fairly characterised as "ludicrous." Why, then, should we rest content with an interpretation of the Act which compels us to adopt such a monstrosity in grammar as "Bland Pills?" Mr. Henry refers to the difficulty the Board may experience in deciding what is proprietary and what is not; and you say that distinctions which appear "ludicrous" to the chemist and druggist may seem free from any such objection to persons who do not possess his technical knowledge. I hold that, in dealing with such labels, it is part of the business of the Board to ascertain whether or not the formula for a preparation indicated by the possessive case is the property of one man. For this purpose the Board might find it necessary to enlist the services of one or more persons qualified to render assistance in that direction. It may be assumed that distinctions, in this connection, which appear ludicrous to the chemist and druggist, are ludicrous, and it seems to me that the employment by the department of persons possessing technical knowledge is indicated here also. I yet trust that some of your readers will favour us with their views upon the points under discussion.

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* Paris: Octave Doin. Pp. i.-iii., 1 to 139, with 92 plates. Four francs.

* London: H. K. Lewis. Royal 32mo. Pp. 1-276. 3s. 6d.

*Edinburgh.* J. A. FORRET.

### MEDICAL MEN AND PHARMACISTS.

Sir,—A few days ago a lady brought to my shop a prescription of which the following is an exact copy:—

*First Bottle.*

| | |
|---|---|
| Quinine | 16 grains. |
| Liquor of strychnine | 40 drops. |
| Water to 8 ounces. | |

*Second Bottle.*

| | |
|---|---|
| Liquor of arsenic | 40 drops. |

Asking for an eight-ounce bottle, she began reading off from her prescription the ingredients. At the strychnine I demurred, and explained to her the only conditions upon which I would sell strychnine to a stranger. Handing the prescription to me, she remarked that she had doubts of being able to get the medicine, as she had noticed her doctor had not signed his name. In conversation with the lady I elicited—along with such interesting particulars as that she was going to put the water to the strychnine and quinine herself, and to shake the bottle before taking each dose—that the prescription was actually written by a qualified medical practitioner. This she established to my entire satisfaction. Chemists will be pretty well agreed as to what were the doctor's reasons for writing the prescription in English and forgetting to put his name or even initials to it. The medical profession talks a good deal about medical etiquette, which I understand to mean an unwritten code of ethics forbidding one medical man from serving another a shabby trick; it also, in my experience, loves a professional fee. But the incident now related—and it is not by any means an isolated case of what may be regarded as unfair treatment of pharmacists at the hands of the profession—appears to show that some medical men at least do not think their ethical code extends to that of pharmacy, so often described at pharmaceutical dinners and functions by those of highest standing in the medical profession, as a branch, a part of that noble profession, the healing art; these would not allow any wages remuneration whatever for the time and skill required in dispensing prescriptions, work often involving as high a degree of professional knowledge and responsibility in one direction as is brought to bear in another in diagnosing the disease and writing the prescription. Briefly, this is the business side of this question from one pharmacist's standpoint; the other sides, that of the medical profession and of the public, would not fail to be interesting to many. Perhaps the editor of the *British Medical Journal*—who so well deserves the gratitude of pharmacists, of the public, and, shall I say, of the medical profession as well? for his efforts to restrict the illegal and irregular sale of poisons—will condescend to give some expression of opinion on this very irregular and dangerous mode of prescribing poisons by a medical man—a method which, in the opinion of the writer, could not fail to encourage the illegal sale and distribution of the same. J. L.

### SOLUBILITIES.

Sir,—Could any of your readers give me definite information as to the solubility of asparagin. Martindale says 1 in 12 of cold water; Roscoe, 1 in 82; Dragendorff, 1 in 40; Brande, 1 in 58. As this is a very wide margin, I should be glad to hear the opinions of some who have had practical experience with it. Chloralose, the new hypnotic, which I believe is a compound of glucose and chloral, is said, in the *British Medical Journal*, to be freely soluble in water, but I find that this is not the case, it being very sparingly soluble in cold water, but on being heated to nearly boiling point it dissolves easily, but crystallises out on cooling to a large extent. I find that about 5 grains to the ounce remains in solution after cooling; this can hardly be called freely soluble. What is the experience of others with it?

*Manchester.* F. W. HORNBY.

⁂ In the Journal for January 28 last, at page 609, it will be found that chloralose is described by its introducers as "slightly soluble in cold water, but soluble in warm water and in alcohol."—[ED. *Pharm. Journ.*]

*R. Roberts.*—1. Pure cultivations of bacteria may be obtained of Dr. Robert Muencke, 58, Luisen-Strasse, Berlin, N.W. Kanthack, Golden Square, or Becker, Maiden Lane, would perhaps supply you. 2. The presence of bacteroids in the root-tubercles of leguminous plants should be demonstrated in a similar way to bacteria in tissues generally, *i.e.*, by staining sections with gentian-violet or other suitable stain and subsequently decolorising the ground tissue. Refer to some work on bacteriology for details.

*R. W.*—We are obliged for your letter, but have no desire to discuss the question whether the title of apothecary is sufficiently descriptive of the qualification now granted by the Society of Apothecaries of London. The recognition of apothecaries to which we referred was that afforded by the Act of 1815, which, if it did not constitute them practitioners of surgery and midwifery as well as of medicine, has been, and still is, used for those purposes. Many general practitioners now on the register have no other qualification than L.S.A. It was in that sense we concur with you in regarding this qualification as well as the title as an "anachronism."

*Erratum.*—In the review of the 'Pharmacopœa Danica,' last week, the last paragraph but one should read—"Jalap tubers are to contain at least 7 per cent. of jalap resin."

## BOOKS, PAMPHLETS, ETC., RECEIVED.

INTERNATIONALE AUSSTELLUNG FÜR VOLKSERNÄHRUNG, ARMEEVERPFLEGUNG RETTUNGSWESEN UND VERKEHRSMITTEL IN VERBINDUNG MIT EINER SPECIELLEN SPORTANSSTELLUNG IN WIEN. From the Secretary.

PHARMACOGRAPHIA INDICA. Part VI. By WILLIAM DYMOCK, C. J. H. WARDEN, and DAVID HOOPER. Bombay: Education Society's Press, Byculla. From the Authors.

CULTURES IN NEDERLANDSCH OOST—INDIE. Premie van De Indische Mercuur, 1893. Amsterdam: J. H. de Bussy. From the Publisher.

THE ATOMIC WEIGHTS ARE, UNDER ATMOSPHERIC PRESSURE, NOT IDENTICAL WITH THE SPECIFIC GRAVITIES. By E. VOGEL, Alameda, Cal. From the Author.

TOOTH EXTRACTION. A Manual on the Proper Mode of Extracting Teeth. By JOHN GORHAM, M.R.C.S. Lond. London: H. K. Lewis. Fcap. 8vo., pp. i.-xvi., 1 to 40. 1s. 6d. From the Publisher.

ANNUAL ANNOUNCEMENT OF THE ONTARIO COLLEGE OF PHARMACY. Fourteenth Session, 1893-94. Toronto. From the Secretary.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Andrews, Bishop and Sons, Corder, Moss, Smith and Co., Usher.

# THE CHEMISTRY OF IPECACUANHA.

BY DR. B. H. PAUL AND A. J. COWNLEY.

Next to opium and cinchona bark, ipecacuanha is probably one of the most important drugs included in the official materia medica, but its chemical history is still very imperfect, and although some of its medicinal effects are ascribed to an alkaloid, there is considerable doubt whether that is always the case.

For several months past we have been engaged in the endeavour to devise a satisfactory method of extracting from ipecacuanha the alkaloid which has been regarded as the active principle of this drug, and to which the name of emetine has been applied; our object being to obtain such means of quantitative determination as could be relied upon when applied to the examination of different samples of the commercial drug or of its medicinal preparations. In prosecuting this inquiry reference has of course been made to the observations of previous experimenters; but instead of deriving much assistance from the published statements of their results, we have found that they lead to considerable uncertainty respecting the chemical identity of the substance. Thus, for instance, in the description of emetine given by Lefort,[*] it is stated to be very readily soluble in solutions of caustic soda or potash, and that in such solutions emetine rapidly undergoes alteration by absorbing oxygen from the atmosphere. We have found that this is not the case with the alkaloid supplied by Merck as pure emetine, or with that which we have ourselves obtained from ipecacuanha. Even on precipitating the base from solutions of its salts with caustic alkalies the precipitate formed is not dissolved again on adding an excess of caustic alkali. There are similar discrepancies between the statements as to the physical characters of the alkaloid of ipecacuanha. Most authorities describe it as being perfectly amorphous, some state that it is susceptible of crystallisation, under certain conditions, while others again describe it, without any qualification, as having the form of "needles"[†] or "crystals."[‡] The statements as to the melting point of the alkaloid also differ considerably. In addition to these discordant statements, we have found, in experimenting with several samples of ipecacuanha, that the alkaloid is not homogeneous, but a mixture of two or more different substances.

Under these circumstances it appeared to be premature to attempt the determination of emetine, as a means of ascertaining the relative value of samples of ipecacuanha or of its medicinal preparations, and we have therefore directed our attention to the general chemical examination of the alkaloid constituents of the drug, as a necessary preliminary to the endeavour to devise some practically applicable method of valuation. This inquiry is not yet sufficiently advanced for the publication of the results as a whole; but some points which have been made out, are of sufficient interest to be worth mention in anticipation of a more complete account.

From the examination of a number of different samples of ipecacuanha we have ascertained that the alkaloid existing in this drug is for the most part a perfectly amorphous substance, of marked alkalinity, forming definite neutral salts which are also amorphous, and, like the base they contain, uncrystallisable by any means we have been able to apply. Hence it would appear that the want of a simple method of obtaining crystallised emetine is likely to remain a constant quantity, and that, in point of fact, the determination of emetine is at the present time only approximatively possible, inasmuch as the substance is unknown.

Further, we have found that this amorphous alkaloid is associated with others which are distinctly crystalline and very different from the amorphous alkaloid in physical characters. This fact we have established beyond doubt, and we are of opinion that it will serve to account for some of the discordant statements which have been made in regard to the alkaloid of ipecacuanha. Thus, for instance, it is stated by Kunz,[*] as well as Lefort and Wurtz,[†] and Podwysotzki,[‡] that although the substance described by them as emetine was generally amorphous, they sometimes obtained the alkaloid in the form of distinctly crystalline needles, by rapid evaporation of an ether solution. On several occasions we have observed a similar formation of very delicate silky crystals when the ether solution of the alkaloid from ipecacuanha was left for some time. Sometimes the formation of these crystals took place in such a manner that the ether solution appeared to become quite solid; but on re-crystallisation from ether the apparently solid mass could be separated into an amorphous portion and a crystalline substance that was much less soluble and, in proportion as it was purified, was found to have a melting point of 90° to 98° C., which is very much higher than that given for emetine by any observer. Consequently the desideratum of crystallisation, assumed to be necessary for the determination of emetine, would not, if it were attainable, suffice for that purpose, since other alkaloids are present which would still have to be separated in order to obtain definite results.

The crystalline alkaloid above referred to is very much less soluble in ether, chloroform, or benzene than the amorphous alkaloid with which it is associated: but, as is usual in such cases, it is not until separation has been carried to some considerable extent that this difference becomes apparent. The quantity of material disposed of in the operations of fractional crystallisation or precipitation, requisite for separating the alkaloids, is so great that very little remains for further examination unless larger quantities are operated with than we have yet had at our disposal.

The stem of Brazilian ipecacuanha appears to contain a small amount of the same amorphous alkaloid that is present in the root; but it is accompanied by a distinctly crystalline alkaloid. It is very sparingly soluble in ether, but separates from the solution on slow evaporation in lemon-yellow transparent crystals melting above 100° C. When precipitated from the solution of a salt by ammonia, it rapidly assumes a crystalline form, and on addition of caustic soda it is dissolved in the manner stated by Lefort (see *supra*). It forms a neutral hydrochloride which is amorphous, and the platinum salt appears to be readily decomposed.

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[*] *Journal de Pharmacie*, [4], ix., 244.

[†] Watts' 'Dictionary,' ii., 431.

[‡] Thorpe's 'Dictionary,' iii., 916.

[*] *Archiv. der Pharmacie*, [3], xxv., 465.

[†] *Comptes rendus*, 84, 1800, and *Annales de Chim. Phys.*, [5], xii., 281.

[‡] *Pharmaceut. Zeitschrift für Russland*, xix., 1.

This alkaloid is present in very much larger proportion, relatively to the amorphous alkaloid, than it is in the root. Consequently it follows that determinations of the amount of alkaloid, as a whole, in the stem will not correctly express the relations of stem and root in regard to the amount of emetine. Evidently no inference can be drawn from such determinations as to the relative values of those portions of the plant as medicinal agents. Before that can be done with any degree of certainty it will be necessary to find means of separating the alkaloids so that their several amounts may be ascertained, and to do that a knowledge of their characters must be obtained. With that object in view we are now engaged in preparing such quantities of the several alkaloids of ipecacuanha as will admit of their chemical characters being studied, so as to furnish data for their separation and identification, besides furnishing material for ascertaining their respective therapeutic effects. Meanwhile, however, it must be pointed out that, apart from the absence of official recognition, there is no ground whatever for the assumption that ipecacuanha stems possess properties which justify their admixture with the roots. So far as anything is known it points in the opposite direction.

Another point to which attention is being directed is the question as to the relative value of other kinds of ipecacuanha, such as, for instance, that of New Granada, which is said to be probably derived from a plant different from that which yields Brazilian ipecacuanha. This Carthagena root is stated to be equal to, if not better than, the Brazilian at the present time.* That opinion is based upon the amount of alkaloid that has been obtained from the Carthagena ipecacuanha, and in regard to that point we have found that there is little or no difference between the two kinds. It has been assumed that the alkaloid present in this root is the same as that contained in Brazilian ipecacuanha. There is no distinct chemical evidence that such is the case; but in the course of our experiments relating to this subject we have at least obtained evidence that Carthagena ipecacuanha contains, in addition to a considerable amount of amorphous alkaloid some proportion of another crystallisable alkaloid, which presents marked differences from the crystalline alkaloid of Brazilian ipecacuanha. Until the investigation of this material, in regard to the chemistry of its constituents and the therapeutic effects they produce, has been thoroughly carried out, and it shall have been shown that they are identical with those of the Brazilian drug, it would, however, be unjustifiable to advocate the substitution of the one for the other upon the ground of possible similarity of origin or of apparently analogous medicinal characters.

Before concluding it may be useful to refer to some of the opinions which have been expressed in regard to the striking absence of agreement between the data obtained in determinations of the alkaloid in ipecacuanha. Upon the basis of those data very dissimilar opinions have been expressed as to the amount of emetine in the drug. While some have taken one per cent. as the maximum others have taken 1·6 as the minimum for a sample of good quality, and others again have insisted that nothing should be recognised as good which does not contain at least 2·5 per cent. Placing side by side with these differences the different experimental data obtained by various operators, which run through all possible gradations between one and upwards of three per cent., it is evident either that ipecacuanha root is a very variable drug, or that the experimental results must have been largely influenced by accidental circumstances. The methods adopted by different operators are generally supposed to be chiefly accountable for the differences in the results obtained, and the facts we have already established as to the existence of distinct alkaloids, in regard to which some solvents exercise a differentiating action, will perhaps help to account for some of the differences between experimental results previously obtained.

There are, however, other conditions the probable influence of which upon the analytical results may be traced. It has been assumed that emetine is destroyed by the action of heat, and hence the recommendation of cold extraction and evaporation at low temperatures. We have not found either of these precautions to be essential or of importance. The solvents used for extraction or to be evaporated in concentrating solutions, generally resemble ether in being of such a nature that no excessive heating need be feared in either of those operations. It is rather in the operation of "shaking out" that loss of alkaloid is likely to be caused, not by its destruction, but as a consequence of particles of the precipitated alkaloid being melted and thus rendered practically insoluble. The fact that the alkaloid becomes almost insoluble after being melted has been pointed out by Kunz, and as its melting point is so low there is great risk of loss in this way if the precipitation is too rapidly carried out. The assumed decomposing action of alkalies has been spoken of as causing low results; but that explanation is inconsistent with the fact, mentioned by Kunz, that emetine offers remarkable resistance to the action of alkalies. Altogether we are disposed to think that in the determination of alkaloid in ipecacuanha differences in experimental results are not due to the nature of the solvent employed for extraction or to the method of operating. It seems much more probable that such differences arise from the want of preserving, throughout the entire treatment, conditions which are suited to the characters of the material operated upon and of the substance to be obtained from it. This appears to be of much greater importance than strict adherence to a mere rule of thumb procedure.

| | Total Mixed Alkaloids. | |
|---|---|---|
| No. | Root. | Stem. |
| 1 | 2·02 | — |
| 2 | 1 95 | — |
| 3 | 2·14 | — |
| 4, picked | 2·12 | — |
| 5 " | — | 0·97 |
| 6 | 2·08 | — |
| 7 | 2·03 | — |
| 8, picked | 2 28 | — |
| 9 " | — | 1·76 |
| 10 | 2·22 | — |
| 11, picked | — | 1·02 |
| Mean | 2·11 | 1·25 |

So far as we are in a position to form an opinion on the point above referred to, from the analytical examination of a comparatively small number of samples of ipecacuanha, we are inclined to the conclusion that the percentage amount of alkaloid in ipecacuanha root does not vary very much from 2 per cent., as shown by the results given in the foregoing table.

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* *Ph.J.*, [3], xxiii., 267, and Keller, *Ph.J.*, [3], xxiii., 592.

The picked samples consisted entirely of either root or stem respectively. The other samples of root were operated upon without separating any admixture of stem that might be present; but it was not in any case sufficient to affect the result very materially. Two of the samples of stem were carefully picked to separate any particles of root; but the other sample, No. 9, was found, after the analysis had been completed, to contain a considerable admixture of portions of root-bark, and that circumstance probably accounts for the higher amount of alkaloid obtained in that instance.

## GLYCERIN SUPPOSITORIES.*

BY FRANK LEONARD DECKER.

During the past few years a great deal has been said and done by some of the leading pharmaceutical manufacturers concerning glycerin suppositories, they claiming that this mode of administering rectal stimulation was much easier for the patient, and also a simpler and quicker way to relieve the bowels than had hitherto been practised. These suppositories are put up for transportation and preservation in different styles, sizes, and shapes, weighing from a half to two drachms each, and containing 95 to 98 per cent. of pure glycerin. Some are put into glass tubes, the ends of which are corked and coated with paraffin, others are coated with paraffin and put on the market in common pasteboard boxes. Another way is to dip them in flexible collodion, then put them in glass tubes, cork the ends, and dip in melted paraffin. Some manufacturers put them uncoated into glass bottles, which are tightly corked and capped. In all cases you are cautioned to keep them from the air, and in a cool, dry place. This precaution is taken because glycerin has a great affinity for water. As the manufacture of these suppositories is controlled almost wholly by a few large houses and extensively advertised by them, their individual merits in each case being extolled, the pharmacist is under the necessity of keeping on hand a line of each of the various makes. He has, therefore, no practical knowledge of the method of their manufacture, or of their composition, excepting the single fact, perhaps, that they contain 95 per cent. or 98 per cent. of glycerin, as the case may be. The object of this paper is to give the pharmacist a practical working formula from which he can make his own glycerin suppositories at about one-third of the cost of those on the market, and one that will probably work quicker results and suit the physician better than common market samples; also to find a process by which they could be assayed for the per cent. of glycerin they contained, and to discover the composition of their base. Nothing but pure glycerin should be used, and its sp. gr. should not be below 1·25. This is equalto a 95 per cent. glycerin, U.S.P. The glycerin I used had a sp. gr. of 1·262, and was 95·912 per cent. pure. The first formula tried was one containing 90 per cent. of glycerin. I found this on page 1213 of Remington's 'Theory and Practice of Pharmacy' (last edition). It consisted of glycerin, 1080 grs.; stearic acid, 80 grs.; carbonate of soda, 40 grs.

Dissolve the carbonate of soda in the glycerin by aid of a gentle heat on a sand bath, add your stearic acid; stir until melted and saponification has taken place, then run the liquid into moulds and chill thoroughly. This gives a very firm, opaque suppository. I next tried the same formula, substituting dried carb. of soda for the crystals. This gave me a transparent suppository, but not quite as firm as the first. Comparing the two, I think the first formula was the best. In that case the acid and soda were mixed in the proportion of their molecular weight, which would give a suppository neutral in reaction. In the second case, where the dried carbonate was used, you would get a suppository alkaline in reaction because dried carbonate of soda is twice as strong as the crystals of carb. of soda, and this might be objectionable in some cases. The next tried was a 95 per cent., using the formula:—glycerin, 47·500; stearic acid, 1·655; dried carb. soda, ·835.

I dissolved the soda in the glycerin by the aid of a gentle heat on the sand bath, added the stearic acid, and stirred constantly until a uniform mixture was obtained; transferred this to moulds, and chilled thoroughly. Got a fairly good suppository, but did not think it quite hard enough, so tried a formula containing glycerin, 47·500; stearic acid, 1·250; dried carb. soda, 1·250.

Used same process for making as before, the result being a hard transparent suppository which I coated with flexible collodion by sticking a needle into the apex of the suppository and dipping in a wide-mouthed bottle filled with collodion, allowing it to stand until dry before removing it from the needle; put them in wide-mouthed bottle and corked tight. I next tried the same formula, using the crystals in place of the dried carbonate of soda. This gave a suppository which exhibited a slight pinkish tinge. In the 90 per cent. suppositories where carb. of soda crystals were used, a white frothy appearance was noticed during saponification. This disappeared in a few minutes, leaving the mixture clean, but the suppository, when moulded, had an opaque appearance. In the case of the 95 per cent. where the crystals were used the mixture remained clear at all times, and the suppositories did not exhibit the opaque appearance referred to, but were quite clear and of a pinkish tinge. In making these suppositories I should use crystals of carb. of soda in place of the dried, the reaction that takes place being—

$$2HC_{18}H_{35}O_2 \quad + \quad Na_2CO_3.10H_2O \quad = \\ 2NaC_{18}H_{35}O_2 \quad + \quad CO_2 \quad + \quad 11H_2O.$$

As stearic acid is a monobasic acid, it requires two molecules of acid to neutralise one of soda, the molecular weight of stearic acid being 284, and that of carb. of soda 286. They would practically unite in the proportion of two of acid to one of soda. This gives you a neutral suppository. If the dried carbonate were used it would give a suppository alkaline in reaction, on account of its being twice as strong as the crystals. I also think it makes a handsome suppository. In case a 90 per cent. were wanted I should use Remington's formula for the same reasons. The next tried was a 98 per cent., the formula used being glycerin, 49·000; stearic acid, ·670; dried carb. of soda, ·330.

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* Graduating thesis presented to the Faculty of the Massachusetts College of Pharmacy, 1893.

This suppository would not harden enough in the mould to be removed. The next time I used glycerin, 49·000; dried carb. of soda, ·700; stearic acid, ·300.

This was but little better than the first, so tried another, using glycerin, 49·000; stearic acid, ·600; dried carb. of soda, ·400.

These moulded fairly hard, but were not firm enough for practical use. I had some difficulty in removing them from the mould (I could not mould them in a Wirtz mould, so used a Wyeth, which is longer and tapers more at the ends; the sides of this mould are straight; in a Wirtz mould the sides bulge out). These I coated with flexible collodion, put in glass tubes, corked the ends and dipped them in paraffin. I experienced considerable difficulty in coating these, the ends being so soft; they fell over on one side and pulled off the needle. As the eyes of the needles were stuck into large corks, I ran the point into the base of the suppository, dipped in collodion, then laid the cork on its side and placed a weight on it to keep it from falling off the shelf. In this way the suppositories which were on a slight slant were coated. On page 30 of the addition to the British Pharmacopœia of 1890 will be found the following formula:—Gelatin, cut small, ½ oz.; glycerin, by weight, 2½ ozs.; distilled water, a sufficient amount.

Place the gelatin in weighed evaporating dish with sufficient water to cover it. After allowing it to stand for a minute or two, pour away the excess of water, set aside until gelatin is quite soft, then add the glycerin. Dissolve over a water bath and evaporate until the mixture weighs 1560 grains, pour the product into suppository moulds holding thirty, sixty, or one hundred and twenty grain measures, or having other capacities as required. Each suppository contains 70 per cent. by weight of glycerin. I do not think they are practical on account of the amount of gelatin they contain, which makes them sticky and hard to dissolve. Care must also be taken when moulding not to get them full of air bubbles. In appearance they are very handsome suppositories.

### *Assay.*

After making the suppositories I tried to find a process whereby they could be assayed for the per cent. of glycerin they contained. As stearic acid is soluble in ether, chloroform, and bisulphide of carbon, I thought I might separate the stearic acid by the use of one of these solvents, then dissolve the residue in absolute alcohol and precipitate the soda with HCl gas, as NaCl; filter this solution and wash with absolute alcohol, evaporate the alcohol from the glycerin, and weigh residue as pure glycerin. I first tried ether, chloroform, and bisulphide of carbon on pure glycerin to find their solvent power; took 2 grammes of glycerin and 4 c.c. of ether and shook for some time, then decanted ether into tared flask, evaporated off the ether and weighed the residue. This gave me ·014 of glycerin. Repeated, using chloroform instead of ether, and the residue weighed ·025. Again repeated, using bisulphide of carbon, and the residue weighed ·010. Found glycerin to be less soluble in bisulphide of carbon than in either ether or chloroform.

Starting with a suppository of known strength and composition, I melted it in the steam bath and added bisulphide of carbon, shook and decanted carefully, added another portion of bisulph. carb., and shook and decanted as before. I then dissolved the residue in absolute alcohol, and passed HCl gas into the solution to precipitate the soda as NaCl, filtered this solution into a long narrow-necked flask which I had previously tared, and washed filter with absolute alcohol. Put flask on steam bath and evaporated until all alcoholic odours had disappeared. The liquid remaining in the flask was of a yellow colour, acid in reaction, and weighed ·915 gramme less than it ought to have done. As the glycerin had been decomposed I could not estimate it as such. It was probably a mixture of glycerin and HCl. The next process tried was with absolute alcohol, as stearic acid and carbonate of soda are both insoluble in this. I thought they would be thrown out of solution, and I could then filter and evaporate off the alcohol. I dissolved the suppository in absolute alcohol and filtered into long-necked flask as before; washed filter thoroughly with absolute alcohol, put the flask which contained the alcohol and glycerin on a steam bath, and evaporated until all odour of alcohol had disappeared. The remaining liquid weighed ·800 gramme less than it should properly have done. It had also decomposed and was of a light straw colour, so could not estimate it as a pure glycerin. This process, like the first, was unsatisfactory. As I could not discover a satisfactory method for the estimation of the glycerin they contained, I tested some of the market samples to find whether they were made from a stearate or an oleate base. In making these tests I used $HgCl_2$, $Fe_2Cl_6$, and $ZnSO_4$. These salts form, with oleic and stearic acids, oleates and stearates of the metals used. The oleate is quite white and rather flaky, while the stearate is harder and more crystalline in appearance. I found the base of the suppositories examined to be stearates.—*New England Druggist.*

## THE CAUSE OF MILDEW OR RUST.*

Mildew on wheat-plants has been known in Great Britain for over three hundred years, according to the records. Probably, however, it has been present upon them since the first cultivation of wheat. That it is a very ancient affection is proved by frequent references to it, and deprecatory remarks concerning its baneful influences in old Greek and Latin writings. The first published account of it, ascribing it to fungoid origin was, it is believed, given by an Italian, Fontana, in 1767.† Persoon gave a more correct and elaborate description of the fungus in 1797, and named it *Puccinia*, after Puccini, a Florentine professor.* The first highly-magnified figures of it were made by Bauer in 1805. These admirable coloured figures were drawn to illustrate the account of the mildew written by Sir Joseph Banks, President of the Royal Society, and published as a separate essay, which was published also in the *Annals of Agriculture*, by Arthur Young.† Sir Joseph Banks had a very good idea of the cause of mildew, or "the blight" in wheat, and of the action of fungus upon it by its spores "germinating and pushing their minute roots, no doubt, though these have not yet been traced, into the cellular texture beyond the bark where they draw their nourishment, by intercepting the sap that was intended by nature for the nutriment of the grain." Sir Joseph Banks also considered it "more than probable that the parasitic fungus of the barberry and that of wheat are one and the same species, and that the seed is transferred from the barberry to the corn."‡ Professor Henslow was the next authority upon this subject, who confirmed Sir Joseph Banks' conclusions, and first propounded the theory, afterwards confirmed by Tulasne, that the yellowish rust which appears in summer, and the black mildew which comes later, are identical. Professor Henslow also gave much credence to the connection between the barberry and the wheat mildew, but did not much advance the knowledge of this part of the subject beyond Sir Joseph Banks' "possible" connection.§ But little was added to the information as to mildew until 1865, when De Bary published the results of experiments practically demonstrating that an Æcidium,‖ or a stage of a fungus known as *Æcidium berberidis*, found on the barberry tree, is the origin of the wheat mildew, or, in other words, the first stage in the life of the mildew.¶ This explained the mystery. All attempts to produce the early stage of the mildew, called "rust," upon wheat plants by means of the black spores, or teleutospores, had utterly failed, and De Bary proved that wheat plants can be affected by the æcidiospores, or spores direct from the barberry tree, and that the teleutospores germinate upon and infect the barberry. De Bary's discovery was not accepted at once, but now it is generally recognised as the solution of the difficult question as to the first cause of wheat mildew.

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* From a Report to the Board of Agriculture, 1892.

† 'Crittogamia Agraria,' pel Dr. Comes.

There is, however, a disposition to believe that the *Æcidium* may have another host plant, at least in other climates, and in some circumstances; this will be dealt with later on.

### THE LIFE HISTORY OF THE FUNGUS.

The wheat mildew, *Puccinia graminis*, belongs to the group of fungi, termed Uredineæ, which, as De Bary points out, are all parasites on living plants.* Some of the species of this group go through the various stages of their existence upon our host plants, being styled autœcious. Others are heterœcious, and pass from one host to a different host in their various stages of development. *Puccinia graminis* is a typical instance of this, as in its Æcidium form it lives upon varieties of Berberis; and only upon corn plants and grasses, first, in its uredospore, and then in its teleutospore condition.

Those who have carefully noticed barberry bushes in the spring have frequently seen yellow spots upon their leaves where threads of mycelium can be seen thickly running through their parenchyma. In these spots there are two kinds of fructification. The one consists of numerous spore-like bodies detached from hyphæ, or branches, from the mycelium formed in urn or flask-shaped receptacles upon the upper side of the leaf. It has not yet been discovered what functions these spermogonia perform.† The other fructification occurs on the underside of the barberry leaf, appearing first, as groups of tiny dots. These are surrounded with mycelial threads, and when ripe they burst through the epidermis, or skin, of the leaf, forming cups or bell-shaped cavities. In the bottom of the Æcidium cup there is a hymenium or collection of "mother spore cells," from whose hyphæ spores are being continually given off. They are not quite round,‡ and are inconceivably numerous, so that thousands may be disseminated far and wide by the wind from one spot, or Æcidium cluster. Mr. Marshall Ward, writing of another species of the Uredineæ, the *Hemileia vastatrix*, the pest of Ceylon coffee planters, estimated that upon one "disease spot upon a leaf of a coffee plant there were 150,000 spores present." There were one hundred and twenty-seven "disease" spots upon one pair of leaves, so that the number of spores upon one plant might be beyond calculation.§

Mr. Carruthers, in a concise report upon the wheat mildew, says, "the quantity of spores produced on a barberry leaf is enormous."‖

These spores, known as æcidiospores, germinate readily upon the leaves of the wheat and oat plant, and many grasses, as enumerated by Mr. Plowright.¶ De Bary first germinated these spores upon wheat plants, and his experiment has been repeated by others. Mr. Marshall Ward observes, "These æcidiospores will germinate readily in water on the leaves of wheat, and their germ tubes enter the stomata, and develop a mycelium which gives rise to the uredospores and eventually to the teleutospores of *Puccinia Graminis*."*

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* 'Synopsis Methodica Fungorum.' Gottingen, 1797.

† *Annals of Agriculture*, vol. xliii.

‡ "A Short Account of the Cause of the Diseases in Corn, called by farmers the Blight, the Mildew, and the Rust," by Sir Joseph Banks, Bart., P.R.S.

§ "On the Diseases of Wheat," by Professor Henslow, M.A. *Journal of the Royal Agricultural Society of England*, vol. ii., p. 1, 1841.

‖ Literally, a small house. De Bary explains it as "In the Uredineæ, a cup-shaped envelope and a hymenium occupying the bottom of the cup, from the basidium of which spores, æcidiospores, are serially and successively abjointed."

¶ "Neue Untersuchungen über Uredineen." De Bary, *Monatsbericht der Berlin Akademie*, 1865.

* "Comparative Morphology and Biology of the Fungi, Mycetozoa, and Bacteria," by A. De Bary.

† Mr. Worthington Smith says, "these spermogonia are supposed to be little grains belonging to a male organism roughly answering to the pollen of flowering plants."—*Diseases of Field and Garden Crops*, by Worthington G. Smith.

‡ Sachs says, "Originally of a polyhedral form in consequence of pressure from opposite sides, they afterwards become rounded." 'A Text-book of Botany,' by Julius Sachs.

§ 'Report on the Coffee Disease,' by H. Marshall Ward, Esq., 1881.

‖ 'The Wheat Mildew,' by W. Carruthers, F.R.S. *Journal of the Royal Agricultural Society of England*, vol. xviii., 2nd Series.

¶ *The Gardeners' Chronicle*, August, 1882.

The æcidiospores are formed from the latter part of April up to as late as July. When the spores fall upon the leaf of a corn or grass plant they germinate in from seven to ten days if moisture is present. The filaments of the germinating spores enter the stomata, and form the mycelium developed in the tissues of the leaves. Uredospores are formed in longitudinal red blotches, or sori, upon the leaves and stems of the host plant, and in this stage the fungus is usually denominated *Uredo linearis*. These spores are soon disengaged and disseminated by the wind, or other agencies, and germinate in favourable circumstances in a few hours upon wheat, oats, rye, and some grasses. There may be several generations of this uredo form of the fungus during the season.

After a time a change occurs in the colour of the spores that are produced. The spores become dark brown, and finally black. The sori also turn to black brown, and the spores then are termed teleutospores, or the final spores. This change happens as the host plants ripen, and is caused by the process of maturing. And it is at this stage that the fungus does the most mischief, or it may even be said its chief mischief, as the host plants require all their starch for forming seed at this period.† If there is much moisture at this time favouring the development of the fungus, it frequently happens that the straw is thickly covered with the black pustules, and the grains of corn are shrivelled because of the abstraction of the starch necessary to make them perfect. As a rule, the first stage, or the uredo stage, with its reddish yellow spores, is not particularly harmful to corn plants, unless the season is exceptionally favourable for its development.

If a section of infected straw is examined it is found that the tissues of the cells have been completely broken down by the action of the mycelium of the fungus, and the teleutospores can be seen upon their hyphæ. These teleutospores are quite different in shape from the uredo spores, being shaped like a club, and dark brown or blackish in colour.‡ They are divided in the middle by a wall or partition, so that they form two cells.

Teleutospores are practically the rest, or resting, spores of *Puccinia graminis*, in which form the fungus is carried through the winter. They do not germinate at once, at least naturally, and go through the winter on the infected straw, or grasses. It is not known whether they "rest" on the ground, or in other places where they may have been carried by the wind and other agencies.

De Bary says: "Teleutospores of *Puccinia graminis* which have lasted during the winter germinate with great readiness in the spring which succeeds their period of ripeness; more slowly and more infrequently during the following summer months, and I was unable to procure their germination after August, or in the spring of the second year."*

Marshall Ward, on the other hand, gives a figure of four teleutospores germinating, of which he says, "the one to the top, and that to the right hand had been kept for three years in my laboratory."†

The teleutospores are, at all events, upon the straw, upon the stubble, and upon numerous grasses;‡ but in this form they will not germinate upon corn and grass plants. So far as is known, the *Puccinia graminis* can only be reproduced, and its life history completed, in this country at least, by means of the barberry, upon whose leaves the teleutospores germinate, by putting forth from their cells germ-tubes, like hyphæ, forming the promycelia producing sporida, which penetrate the epidermis of the barberry leaves, and, like the potato fungus, *Phytophthora infestans*, establish mycelia in the parenchyma.§

In due course the æcidium form, *Æcidium berberidis*, is evolved from these mycelial centres, and the æcidiospores are distributed over the land in the same manner as the spores of the fungus which attack the potato plant, and those of other destructive fungi.

The æcidiospores germinate and produce uredospores upon wheat, oats, and rye plants, and many grasses. Oat plants, fortunately, are not materially injured in this country, but in other countries, as Germany, Russia, Sweden, Norway, with others, both oat and rye plants are as much affected as wheat plants. The injury caused to oats and rye is similar to that caused to wheat; the straw is blackened and deteriorated in value, and the grains are shrivelled, small, and deficient in starch.

### THE BERBERIS AND MILDEW.

In the history that has been given of this remarkable fungus and its many forms, it has been endeavoured to avoid minute details and elaboration, and merely to place before those principally and vitally interested the most salient and practical points. The least clear and definite among these is in respect of the intermediate host of the fungus, which is alleged to be the Berberis; and the Berberis alone. The careful investigations of De Bary failed to discover any other means of continuity. Many skilled mycologists have made experiments in this direction without any new discovery. Mr. Plowright has especially devoted himself to this study, and though once light seemed to be showing, obscurity still prevails.

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* "Illustrations of the Structures and Life History of *Puccinia Graminis*, the Fungus causing the Rust of Wheat," by Marshall Ward, M.A., F.R.S., F.L.S. *Annals of Botany*, vol. ii., 1888-9.

† As is well known, parasitic fungi cannot form starch like other plants which have chlorophyll, and must get this food from the host plants.

‡ Uredo spores and teleuto spores can sometimes be found together, coming from the same mycelium, or centre.

* 'Comparative Morphology of the Fungi, Mycetozoa, and Bacteria,' by A. De Bary, 1884.

† "Illustrations of the Structure and Life History of *Puccinia Graminis*, the Fungus causing the Rust of Wheat," by H. Marshall Ward, M.A., F.R.S., F.L.S. *Annals of Botany*, vol. ii.

‡ Mr. Plowright gives a list of thirty-two grasses which are hosts of *Puccinia Graminis*. Among these are rye grass, couch grass, and other common grasses in fields, meadows, and hedgerows.

§ De Bary says that "If the tube receive sufficient nourishment it develops directly in many cases into a mycelium or thallus, like that of the parent, and it is therefore the primordium of the mycelium." *Op. cit.*

This *Berberis* connection has been long known. Sagacious British farmers a great while ago suspected barberry trees of blasting their wheat. It formed the subject of one of Arthur Young's questions in the wheat mildew circular alluded to before.[*] Sir Joseph Banks speaks of the possible connection between the barberry and mildew. Sir John Sinclair also mentions cases where the presence of "barberry bushes" caused mildew in the neighbourhood.[†]

In France the pernicious influences of the barberry is fully recognised. As recently as April, 1891, an order was issued by the Prefect of the Department of Eure-et-Loire, based upon the law of 1888 empowering local authorities to decree the destruction of insects and fungi injurious to agriculture, compelling landowners, tenants, and métayers, to root out and utterly destroy the barberry (l'épine vinette) upon their farms and lands before the 10th of July, 1891, and in woods and forests to a distance of 32 yards from their outsides, seeing that the barberry is a veritable scourge of cereals, on which it develops black rust (rouille noire).

Then there is the old barberry law of Massachusetts, America, enacted by the Governor, Council, and House of Representatives,[‡] which provided that in order "to prevent damage to English grain from barberry bushes" all such bushes should be destroyed.

It should be understood that the æcidium of *Puccinia graminis* has been found upon several species of Berberis. Mr. Plowright gives a list of eight of these, including one of the pinnate species known as *Mahonia*, which are so frequently found in ornamental woods and shrubberies.[§] It has also been produced upon *Mahonia aquifolium*, which is so largely used for planting in game covers, and it may be inferred that other species of *Berberis*, and of other genera of the Berberidaceæ, are also hosts of the fungus.

The weak point in the conclusions arrived at by scientists as to the barberry being the sole host of the æcidium form of *Puccinia graminis* is the fact that in countries where the Berberidaceæ are not indigenous, mildew on corn-plants is more abundant and destructive than in Europe. In parts of America, for instance, these shrubs are not known. In the Australasian colonies, where mildew is fearfully prevalent, they do not occur. In India the barbery is common in the Northern Provinces, but "throughout the plains of India there is no species of barberry, and it is necessary to assume that the wheat plants were attacked by the æcidiospores of the barberry which had been wafted to them from enormous distances. The spores are, however, exceedingly minute, and it is quite possible they may be carried by the winds to such immense distances."[*]

The Australasian mycologists are endeavouring to discover the host of the æcidium, which stage has never yet been seen in Australasia.[†] Dr. Cobb, the pathologist to the New South Wales Department of Agriculture, states this, and at the Conference of Australasian delegates at Sydney in 1891, he said that "it was not true that the barberry stage was necessary for rust to go annually through the barberry. The mistake had been made in Australia in assuming this. The facts in a cold country would probably warrant the assertion, but here, inasmuch as they could find red rust existing all the year round, it followed that it was not necessary at all."

Mr. D. MacAlpine, of the Victoria (Australia) Department of Agriculture, holds that as the barberry is not indigenous to Australia, and cannot play the host to the promycelial spores, either the red spores can prolong their germinating power in the genial climate, and carry on the life of the fungus from year to year, or there is an unknown plant on which the promycelial spores germinate. Mr. Pearson, another authority, says, some botanists hold that the promycelial spores, which are produced during warm spring weather, and are wafted about in countless numbers not long before the rust begins to show itself on the wheat, alight on the young wheat plants, and if the atmospheric conditions are favourable germinate thereon, entering the wheat tissues through the stomata, and give rise to the red or uredo stage."[‡]

Plant pathologists in Australia are endeavouring to discover another host than the barberry for the *Puccinia graminis*, or to determine that the teleutospores can germinate upon corn plants and grasses, and whether the climatic conditions, which differ totally from those of other rust-affected countries, shorten the chain of stages in the life of the fungus believed to be necessary in Europe.

Attention is also being directed to this question by mycologists in all parts of the world since the Australasian Rust Conferences have made fully public the extraordinary prevalence of rust in hot, arid regions, and of its persistence without the barberry.

*(To be continued.)*

## LIQUORICE TRADE OF ALEPPO.

The trade in liquorice root has largely developed, and merits special attention. Collection is now made on a large scale throughout the province, thus compensating the peasantry in some degree for the losses caused by bad harvests. 6,145 tons, valued at £43,231, were exported to the United States, as compared with 4,293 tons, valued at £28,077, in 1891.—*Consular Report*, 1200.

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[*] *Annals of Agriculture*, by Arthur Young, Esq., F.R.S., vol. xliii., 1808.

[†] 'Result of an Inquiry into the Nature and Cause of the Blight, the Rust, and the Mildew,' by Sir J. Sinclair, Bart., M.P.

[‡] 'Province Laws of Massachusetts,' 1736-1761, p. 152. Anno Regni Regis Georgii II., Vicesimo Octavo, Cap. X. (Issued January 13, 1755).

[§] 'Wheat Mildew and its connection with the Barberry.' *Gardeners' Chronicle*, August, 1882.

[*] "Rust and Mildew in India," by the late A. Barclay, M.B., F.L.S. *The Journal of Botany*, vol. xxx., 1892.

[†] "Contributions to an Economic Knowledge of the Australian Rusts (Uredineæ)," by N. A. Cobb. *Agricultural Gazette of New South Wales*, January, 1892.

[‡] 'Appendix to Report of Conferences on Rust in Victoria,' 1890, by Mr. A. W. Pearson.

## OPIUM TRADE OF MACAO, CHINA.

Opium continues, in spite of a considerable decrease, to be the most valuable article of import and export. The decrease is not, however, actually due to any competition from the native drug, as very little has as yet found its way so far south. It is in all likelihood to be attributed to heavy stocks in the interior. The import of raw opium during 1892 consisted of 3,638 boxes Patna, 159 boxes Benares, and 17,088 lbs. Malwa, of these, 295 boxes and 29,170 balls of Patna were exported in a crude condition to various points in the interior, and along the seaboard even as far as Pakhoi, as well as 1,733 balls Benares and 17,088 lbs. Malwa. For local consumption, 30,175 balls of opium were boiled down; and for export 79,475 balls. It is worth while noticing that Macao prepared opium enjoys still a high reputation, as it is alleged that something in the process of preparation makes it superior to any boiled elsewhere. This fact, combined with the expiry of the agreement with the Hong-Kong opium farmer, has had the effect of increasing the direct export, as the Australian and San Francisco boats have had to come over and ship their valuable and remunerative cargoes in Macao instead of Hong-Kong. The amount of prepared opium exported and its various destinations will be seen in the subjoined table :—

| To— | Quantity.<br>Ozs. |
|---|---|
| Taipa | 17,546⅔ |
| Coluan | 19,243⅔ |
| Hong-Kong | 1,373,506⅔ |
| California | 705,337⅓ |
| Australia | 656,400 |
| Total | 2,772,034⅓ |

The opium farmer here enjoys the monopoly of boiling down opium, though others have the privilege of importing and exporting it in a crude state, so that the profits he must realise must amount to a considerable sum. Of course, against this must be put the high sums he pays to Government for the three years' privilege.—*Consular Report*, 1238.

## SULPHUR TRADE OF ITALY.

### PALERMO.

So small is the quantity of sulphur exported from Palermo that all mention is excluded from the tables of exports for 1892. The ports of Catania, Licata, and Port Empedocle (Girgenti) being nearer the mines receive and ship off this mineral abroad. The exportation from these ports in 1892 exceeded the amount shipped in 1891 by 18,000 tons, but we have only received the details for ten months, which for the corresponding period of 1891 are as follows :—

| Country. | Quantity.<br>1891.<br>Tons. | <br>1892.<br>Tons. |
|---|---|---|
| United States | 18,503 | 67,928 |
| France | 46,382 | 62,393 |
| Italy | 43,903 | 34,435 |
| Great Britain | 20,523 | 21,105 |
| Russia | 12,325 | 11,408 |

Notwithstanding this increased exportation the state of the trade is depressing, owing to the constant xcess in the output from the mines and consequent depreciation in value. The stock at the outports, mentioned at the end of 1892, exceeded that of 1891 by 58,000 tons. Some mine owners at Caltanissetta are endeavouring to form a syndicate to regulate this excess in output at the mines to prevent over-production and consequent fall in prices. As a rule, when prices are high, mine owners resume operations and depress their own trade by glutting the markets; hence for the necessity felt of organising a syndicate to regulate the supply. But the difficulty apprehended is the inherent distrust Sicilians have of each other, and on this account it is feared it will be of short duration. When it is remembered that the number of sulphur mines worked in Sicily is about 400, producing an average annual yield of 328,000 tons, valued at £90,000, and giving employment to nearly 30,000 workmen, the anxiety caused by the present depression can be easily understood, and, in fact, a deputation of Sicilian mine owners waited not long ago upon the Minister of Public Works in the endeavour to obtain a reduction in railway charges on the conveyance of coal, machinery, and other materials essential for the working of the mines, and a memorial at the same time was submitted to the Minister.

### CATANIA.

The exportation of sulphur in 1892 surpassed that of 1891 by 20,948 tons, as shown by the following table :—

| Country. | Quantity.<br>1892.<br>Tons. | <br>1891.<br>Tons. |
|---|---|---|
| United States | 14,774 | 9,353 |
| India | 876 | 1,039 |
| Great Britain | 13,704 | 11,316 |
| Belgium | 305 | 165 |
| Holland | 1,753 | 839 |
| Germany | 10,662 | 7,993 |
| Denmark<br>Norway<br>Sweden | 3,818 | 2,283 |
| Russia | 1,772 | 561 |
| Spain and Portugal | 13,251 | 9,960 |
| France | 7,325 | 1,739 |
| Austria | 7,250 | 7,065 |
| Turkey and Greece | 15,720 | 14,903 |
| Italy | 28,786 | 31,832 |
| Total | 119,996 | 99,048 |

Prices ruled so high in 1891 and gave such an impetus to the sulphur mining industry that in many cases mine owners found it difficult to procure workmen, or "pickmen," as they are called, as many of this class began work on their own account by opening up old workings where they thought they could earn better wages. The production was, therefore, augmented to such a degree that prices began to decline from the beginning of 1891 till by the end of December they stood at a very low figure. Unhappily, they have not recovered, and mineowners find they cannot go on working their mines so actively as before, and, therefore, a much smaller output is expected in 1893 and a consequent improvement in trade. The output in 1891 is given at 347,568 tons from 524 mines that were worked in that year, another 100 or so remaining closed.—*Consular Report*, 1243.

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JULY 22, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE MEDICINE STAMP ACTS.

IN connection with the steps taken by the Nottingham Chemists' Association to draw attention to the manner in which these Acts are being enforced (see *ante*, p. 51), a letter has been received by the President of the Association from Mr. H. SMITH WRIGHT, M.P., enclosing a communication from the Board of Inland Revenue, sent in reply to representations made by Sir WALTER FOSTER on the subject. In this it is stated that, while in the opinion of the Board there is no just cause of complaint against the manner in which the officers administer the Acts, the law is old and the duty of interpreting it is hence a very difficult and disagreeable one. The statement is also made that the Board will welcome a simpler formula for determining what medicines are liable to stamp duty and that, whilst the late chairman of the Board invited the Pharmaceutical Society to advise on the amendment of the Act, the present chairman will also be most willing to consider the question with any body or bodies having authority to speak in the name of the chemists of Great Britain. Mr. SMITH WRIGHT, in commenting upon the last paragraph in the Inland Revenue letter, expresses the hope that Mr. MILNER's willingness to confer on any particular points may lead to some remedy for the grievances complained of. At the same time he explains that he can quite understand that there must be great difficulties in administering the Acts.

In *Truth* of the 20th inst. reference is made to this subject in connection with the case of a chemist who has recently been detected in selling a taxable medicine without a stamp, whereby he became liable to a penalty of fifty pounds. It was chiefly the mode in which the omission was detected that was complained of, the purchaser of the article having been an emissary from Somerset House, in fact something similar to an *agent provocateur*, who would be rewarded by a percentage of the penalties exacted in consequence of his acting the part of spy and informer. *Truth* thinks this a most detestable system of harrying tradesmen and that it ought to be stopped.

The writer of the article also goes further, and expresses the opinion that the tax on proprietary medicines should be abolished altogether. In support of that view, it is urged that, apart from the economic objections, the stamp conveys to the ignorant an idea that the articles bearing the stamp are in some way guaranteed or approved by the Government. That is thought to be a most mischievous effect, since many of the compounds thus protected are of a baneful nature, while some of them are little better than deadly poison. This view of the matter betrays a want of knowledge of the circumstances. The notion that any authoritative recognition is given by the stamp is quite illusory. Moreover the argument is inconsistent, for the abolition of the stamp duty would in no way prevent the sale of the dangerous articles referred to, but probably afford still greater facilities for their indiscriminate distribution, as we have pointed out on several occasions.

## ERRONEOUS IDEAS OF THE PHARMACY ACT.

THE *Echo* of last Wednesday reports an inquest held by Dr. DANFORD THOMAS at the Paddington Coroner's Court on a man who died from poisoning by oxalic acid which had been purchased at an oil shop, and, as it appeared, was supplied by the seller without any label. The jury came to the conclusion that the deceased person had taken the oxalic acid in mistake for Epsom salts, and, on that account, returned a verdict of "accidental death." The remarkable part of the report is that which represents the Coroner as having stated at the conclusion of the evidence that, as the poison was purchased at an oil shop, the seller was not bound by law to label it, but that if it were purchased of a chemist he would be bound under the provisions of the "Sale of Poisons" Act to label it "poison." It may be presumed that these remarks applied to the omission which was held by the jury to have led to the poisoning, and the *Echo* appears to have understood them in that sense, as the paragraph is headed "an anomalous Act of Parliament." The view of the Pharmacy Act conveyed by that heading would be fully justified if it afforded any ground for such a statement as the Coroner is represented to have made. But we cannot think it possible Dr. DANFORD THOMAS could have made a statement so utterly unfounded, and are more inclined to suppose the reporter has made a mistake. In any case it is desirable to correct the false impression that would be conveyed by the report and by the implication that the law in regard to the sale of poisons is so absurd in its provisions as the comment of the *Echo* suggests. Such erroneous references in the lay press to matters of which the general public have but little special knowledge, though they may be of great public importance, are likely to have a very misleading and mischievous effect in any case. But when they purport to be supported by the authority of a public official who has taken a prominent part in calling attention to the need for proper regulation of the sale of poisons as Dr. DANFORD THOMAS has done, it is especially desirable that they should be corrected. We hope that Dr. DANFORD THOMAS will take that view of the paragraph referred to, and himself point out the erroneous statements it contains.

## BRITISH PHARMACEUTICAL CONFERENCE.

We have received from Mr. W. A. H. Naylor, Honorary General Secretary to the British Pharmaceutical Conference, the following preliminary list of papers to be read at the Nottingham meeting in August:—

1. Papaine, by Frederick Davis, B.Sc.
2. Report on Coto Bark. Part I., by W. Elborne, B.A. (Cantab.).
3. Examination of Bees-Wax, by E. J. Parry, B.Sc.
4. Suggestions for the Standardisation of the Alkaloidal Tinctures of the British Pharmacopœia, by E. H. Farr and R. Wright.
5. Note on Collodium Belladonnæ, by R. Wright.
6. Note on Easton's Syrup, by R. Wright.
7. An Apparatus for Washing and Draining Precipitates out of Contact with Air, by J. A. Forret.
8. A Paper by F. Clowes, D.Sc., F.I.C.
9. Note on the Specific Gravity of Sandal Wood Oil, by M. Conroy.
10. The Alkaloidal Value of Conium Fruit, by E. H. Farr and R. Wright.
11. Effervescent Caffeine Preparations, by Lewis Ough, F.L.S., F.C.S.
12. Liquid Belladonna Plaster, by W. A. H. Naylor.
13. The Pharmacy of the Thyroid, by Edmund White, B.Sc.

We have also been favoured by the Superintendent of the Line, of the Great Northern Railway, with particulars of the train services and other arrangements in connection with the Conference meeting next month. Though no reduction will be made in the fares on first proceeding to Nottingham or on leaving there at the end of the meeting, during the sitting of the Conference return tickets at a single fare for the double journey will be issued from Nottingham to any station not more than fifty miles distant. These will be available for return the following day, and those desiring to avail themselves of this arrangement must produce their cards of membership or letters of invitation. The concession would have been of greater practical value and more likely to attract visitors to the Conference if it had applied to distances beyond fifty miles rather than under. As it stands it offers no advantage except to dwellers in the vicinity of Nottingham, who doubtless would attend in as large numbers without any such attraction, and form but a small proportion of those who will be present. It is further stated that parties travelling together can engage saloon carriages, either first or third class.

## A NEW ANTISEPTIC.

In the Journal of the 8th inst. mention was made of some preparations which have recently been introduced as antiseptics or disinfectants, which contain substances analogous to carbolic acid but comparatively much less poisonous, and therefore less likely to be productive of accidents when used for domestic purposes. One of these preparations, distinguished by the name of Izal, has been made the subject of experimental examination by Dr. Klein, who certifies that it possesses very considerable efficacy as a bactericide and destroyer of the germs by which infectious diseases are communicated. The recommendation of this preparation by so high an authority upon the subject is a great advantage, and it may be regarded as affording good ground for confidence in the utility of the article as an antiseptic and disinfectant.

## HARRY DIXON FUGE.

It is with the deepest regret we learn of the death, after only four days' illness, of Mr. H. D. Fuge, at Newcastle, Staffs, the sad event occurring on Sunday evening last as the result of a severe attack of scarlet fever. Mr. Fuge was a Bell Scholar in the Society's School in 1888, whilst in 1889 he won the Pereira Medal, Silver and Bronze Medals in Practical Chemistry, Botany, Materia Medica, and Pharmacy, and Certificates of Honour in Chemistry. Subsequently he was appointed Assistant Demonstrator in the educational laboratories of the School, and retained this post until the beginning of the present session, when he matriculated at Cambridge University. In 1891 he passed the Intermediate Examination for the degree of Bachelor of Science of London University, on December 31 last we were able to announce that he had gained a Major Foundation Scholarship for Natural Science, at Trinity College, and there was every prospect that he had entered upon a successful career. He was a careful and painstaking worker and specially gifted as a teacher, possessing in a marked degree the faculty of thoroughly realising the difficulties that beset students in their work. Brilliant yet modest, studious yet genial, versatile yet thorough, his death is a distinct loss to pharmacy and science, and a large circle of friends will unite with us in deploring his untimely end.

## THOMAS SMITH.

As we are preparing to go to press we have received intimation of the death of Mr. Thomas Smith, founder of the well-known firm of T. and H. Smith and Co., at the age of 87 years. Mr. Smith died at his residence, Heriot Hill House, Edinburgh, on Wednesday, 19th inst., at 5 p.m. He has been a member of the Pharmaceutical Society since 1853.

## MEETING OF "NATURFORSCHER UND AERZTE."

In the pharmaceutical section of this Association, which will hold its meeting this year at Nüremberg, arrangements have been made for the reading of papers on the following subjects:—

By Professor Hilger, of Munich.
 1. The Distribution of Cholesterine Ethers in Plants.
 2. The Valuation of Narcotic Extracts.
By Professor Flückiger.
 Valerius Cordus.
By Dr. Mankiewitz, of Posen.
 The Detection of Blood Stains.
By Dr. Thoms, of Berlin.
 Chemical and Pharmaceutical Communications.
By Dr. Baumert, of Halle.
 The Colouring of Articles of Food, etc., from the point of view of Forensic Chemistry.
By Dr. Degener, of Brunswick.
 The Necessity of Sterilisation in Pharmaceutical Operations.
By Dr. Ludwig Reuter, of Manheim.
 Notes on Chemico-Pharmaceutical Manufactures.
By Apotheker Kittl, of Waslchem.
 Pharmaceutical Notes.
By Apotheker Weigle, of Nüremberg.
 The Constituents of Pepper.

Papers will also be read by Professor Tschirch, of Bonn, and Professor Vulpius, of Heidelberg; but the subjects have not yet been announced.

### INCOMPETENT DISPENSERS.

A fatal case of the poisoning of a child is reported in the *Yorkshire Herald* of the 13th instant as having occurred at Lincoln in consequence of a mistake made by a doctor's errand boy, who appears to have been entrusted with the supply of medicines to patients. At the inquest it was shown that the doctor attending the child had another patient of the same name, and that medicine containing opium and intended for an adult was given by the surgery errand boy for the child. Before the mistake was discovered a dose had been given and the child quickly went to sleep. Emetics were then administered, but notwithstanding all efforts the child died in the evening. The jury returned a verdict of "death by misadventure," and expressed the opinion that neither the doctor nor the dispenser was to blame, but at the same time suggested that "a more intelligent and responsible person should take the place of the errand boy." We have long contended that in the dispensing of medicine by medical men, competent qualification of the dispensers should be insisted upon as an essential condition of public safety.

### PRESENTATION TO A PHARMACIST.

On Tuesday, July 11, an interesting ceremony took place at the Dumbarton Burgh Hall, when the retirement from office of Mr. John Babtie, pharmaceutical chemist, was made the occasion of a public recognition of his services to the town. Up to November last, when he retired, Mr. Babtie had been a member of the Dumbarton Town Council for twenty years, and had successively occupied the offices of Treasurer, Bailie, and Provost, acting in the last-named capacity during thirteen years. A sum of four hundred and fifty pounds was raised by subscription, and Mr. D. W. Stevenson, R.S.A., Edinburgh, was commissioned to execute a bust in marble of the ex-Provost for presentation to himself and a replica to be given to the Town Council. The unveiling of the latter was performed on Tuesday, on behalf of the subscribers, by Dr. Denny, who subsequently, after a banquet in the Lesser Burgh Hall, presented Mr. Babtie with a silver casket containing an address, together with a diamond pendant and diamond ring for Mrs. Babtie. Mr. Babtie's membership of the Pharmaceutical Society, we may note, dates from 1853.

### CANADA AND THE PHARMACOPŒIA.

The *Canadian Pharmaceutical Journal*, in commenting upon Professor Attfield's report to the Pharmacopœia Committee of the General Medical Council, refers specially to the suggestion therein contained that the Pharmacopœia should be so far extended as to be applicable to the whole of the British Empire. On behalf of Canada it is stated that, though the British Pharmacopœia is the recognised standard, there are hundreds of preparations in general and constant use in the Dominion of which that work makes no mention. Though the subject of a Canadian Pharmacopœia has been frequently discussed during the last twenty-five years, nothing definite has been done in the matter, and it is thought that Professor Attfield's suggestions may be the means of bringing matters to a definite conclusion.

# Transactions of the Pharmaceutical Society.

## MAJOR EXAMINATION QUESTIONS.

## (LONDON).

*July*, 1893.

### CHEMISTRY.

*Time allowed, Three hours.*

1. What is chemical dissociation? Describe an experiment in illustration of it.
2. Give a full account of the method of preparing pure hydriodic acid. What are the properties of the compound?
3. What is acetyl chloride, and how is it prepared? How does it differ from the monochloraldehyde of the same series? Give the constitutional formula of each.
4. What is the difference between a "secondary" and an "iso" alcohol? Give examples.
5. Give a short account of the more important members of the cellulose group, with their characteristic reactions.
6. What are the nature and sources of cinnamic acid? To what series does it belong?

### PHYSICS.

*Time allowed, Three hours.*

1. What is the nature of the rays that lie outside the visible spectrum at each extremity? How may they be recognised? What is the character of the undulation in each case as compared with the visible rays?
2. Describe the uses of the eye-piece and the object-glass in a compound microscope, and give reasons for limiting the magnifying power of the eye-piece.
3. Describe an experiment by which the varying conducting power of metals for heat may be shown.
4. How may the melting point of such metals as silver and gold be determined?
5. Give two different methods by which a steel bar may be magnetised: if such a bar be broken in two, what are the magnetic properties of the divided portions?
6. Describe the construction and special uses of the galvanometer and the voltameter.

### MATERIA MEDICA.

*Time allowed, Three hours.*

1. Describe *Piper angustifolium*. On what does the styptic action of the leaves depend?
2. What is honey? Give some adulterations, and how they may be detected.
3. Name some drugs in which cinnamic acid is found; how may it be isolated?
4. Give the geographical source of styrax benzoin. Describe benzoin and mode of obtaining it. Give the percentage of benzoic acid in good samples of the drug, and the methods by which it may be isolated.
5. Describe cinnamon and cassia. Give their respective geographical sources, and how may they be distinguished by chemical tests.
6. What is piperazine, phenazone, papain?

### BOTANY.

*Time allowed, Three hours.*

1. What is meant by Rejuvenescence? Describe the modes of reproduction on Conjugatæ and Confervæ.

2. Give the meaning of the following terms, with examples—Heliotropism, Apheliotropism, Geotropism, Apogeotropism.

3. What are Cormophytes? How does the sap ascend and descend in them.

4. Describe thoroughly the plants marked No. 1 and No. 2.

5. Describe the natural order Graminaceæ. How may it be distinguished from allied orders? Name a few indigenous grasses.

6. Give botanical descriptions of Irish and Iceland Moss. Also their respective modes of reproduction.

## EXAMINATIONS IN EDINBURGH.

*July*, 1893.

Present—Messrs. Boa, Dott, Gibson, Jack, Kinninmont, Maben, Nesbit and Stephenson.

Professor Sir Douglas Maclagan attended on behalf of the Privy Council.

### MAJOR EXAMINATION.

*Three* candidates were examined, and failed.

### MINOR EXAMINATION.

*Ninety-seven* candidates were examined. *Fifty-six* failed. The undermentioned *forty-one* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Anderson, David | Perth. |
| Ashworth, Whittaker | Liverpool. |
| Bainbridge, Algernon Rupert Cyril | York. |
| Barton, Frederick Keal | Liverpool. |
| Beal, Johnson | Pendleton. |
| Callaway, James Thomas | London. |
| Calvert, William | Carlisle. |
| Coltman, Thomas Arthur | Thirsk. |
| Coupland, Arthur | Buxton. |
| Cran, Newell Burnett | Aberdeen. |
| Darling, John Martindale | Yarm. |
| Davidson, Walter | Hawick. |
| Dean, George Saville | Rochdale. |
| Dryburgh, David | Cowdenbeath. |
| Eunson, James Henry | Sunderland. |
| Greenwood, John William | Mytholmroyd. |
| Hewitt, Frederick | Bolton. |
| Hogg, Richard | Glasgow. |
| Holoran, Frank George | Retford. |
| Irons, Thomas Martin | Dundee. |
| Jack, James | Cullen. |
| Kerr, Hugh | Dalbeattie. |
| Killoh, Alexander | Aberdeen. |
| Lovett, William Naylor | Nottingham. |
| McCallum, Alex. Phimister | Buckie. |
| McGregor, William John | Ellon. |
| Mitchell, William | Glasgow. |
| Moir, David | Glasgow. |
| Murray, Adam Porteous | Leith. |
| Nicholson, William | Wigton. |
| Noble, John Geo. Barrington | S. Shields. |
| Obrien, Edward | Dundee. |
| Sangster, Charles | Monquhitter. |
| Scott, Walter Stanley | Middlesborough. |
| Sharp, Alexander | Boat of Garten. |
| Smith, Herbert | Workington. |
| Strawson, Vincent Val. Latham | Liverpool. |
| Thwaites, Alfred | Ryde. |
| Welsh, John | Chester. |
| Whittle, James | Bedlington. |
| Wilson, James | Aberdeen. |

# Proceedings of Societies in London.

## ROYAL SOCIETY.

### LIGHT INTENSITY AND CHEMICAL ACTION.*

BY CAPTAIN W. DE W. ABNEY, C.B., F.R.S.

It has been generally assumed that when the products of the intensity of light acting on a sensitive surface and the time of exposure are equal, similar amounts of chemical action are produced, and with the ordinary exposures and intensities of light employed such, no doubt, is practically the case, and any methods of measurement hitherto practicable have been insufficiently delicate to discover any departure from this law, if such departure existed. In some recent experiments, however, I have discovered that this law breaks down under certain conditions, and I think the fact worthy the attention of those interested in the subject, since it is possible that these conditions may arise with other experimenters. Quite lately I have described the method of comparing the photographic value of sunlight with that of candle-light (*Photographic Journal*, June, 1893), which was as follows:—A beam of sunlight, after three reflections from plain glass mirrors, was admitted through a narrow slit to sensitive bromide paper stretched round a drum of about 4 inches in diameter. The drum could be caused to rotate round its axis at any speed up to about sixty revolutions per second by means of an electro-motor. A small exposure with this light was given to the paper during the rotation of the cylinder. Subsequently an amyl-acetate lamp was placed in position at any convenient distance from the same slit, and a fresh portion of the same sensitive paper exposed to its action during a much longer period, the rotation being continued as before. The slit was next replaced by a small square aperture, of some ½-inch side, and further portions of the same paper exposed to the amyl-acetate light at the same distance, for varying but known exposures, with the drum at rest. On development the paper showed three images—a narrow band of deposit of the width of the slit, caused by the sunlight; a second band of the same width, due to the light from the amyl-acetate lamp; and a third row of squares of varying blackness of deposit, due to the different exposures given with the drum at rest.

If the width of the slit be accurately measured, the band formed by the amyl-acetate lamp is evidently superfluous, supposing the usually accepted law to hold good under all circumstances, as by measuring the blackness, or rather want of whiteness, of the different squares, and using them as ordinates to the abscissæ which were the times of exposure, and drawing a curve through them, the blackness produced by the sunlight could be referred to that produced by the light of the amyl-acetate lamp, and its equivalent value in terms of the latter light be calculated. The band of deposit produced by the amyl-acetate lamp was introduced as a check, for its blackness could also be referred to the curve, and the width of the slit be calculated from it. On making such calculations I was surprised to find that in every case the calculated width of the slit was always considerably less than what it was in reality, the difference being far beyond that which would be caused by any error in the measurement. This led me to commence an investigation into the cause of this difference, and what has already been carried out is sufficient to show that there is a failure in the usually accepted law. It may be pointed out that, if it held good, the sum of any number of very short exposures should be equivalent to a single exposure for the same length of time.

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* A communication on a failure of the law in photography that when the products of the intensity of the light acting and of the time of exposure are equal, equal amounts of chemical action will be produced. Reprinted from *Photography*, July 6, 1893.

The experiment which naturally suggested itself was to expose a sensitive surface to the action of the light of an amyl-acetate lamp passing through a slit as before, the drum on which it was stretched being caused to rotate at high and low speeds, and also to place on the same paper a scale of exposures with the drum at rest. These were all developed together. An example of one of many experiments is given as an illustration.

The circumference of the drum with the paper stretched round it was 12·25in. The width of the slit was arranged to be 0·012in. The amyl-acetate lamp was placed two feet from the slit, and a rotation of 30 per sec. was given to the drum for one exposure and 1 per sec. for a second exposure. In the first case the time of exposure during each revolution was

$$\frac{0·012}{12·25} \times \frac{1}{30} \text{ sec., or about } 1/30{,}000 \text{ sec.}$$

The sum of the exposures during 20 min. was thus 1·176 sec.

In the other case the exposure was

$$\frac{0·012}{12·25}, \text{ or about } 1/1{,}000 \text{ sec.}$$

and the sum of the exposures was, as before, 1·176 sec. Thus the first individual exposures had only $\frac{1}{30}$ of the duration of the second exposures, though in the aggregate they were the same.

A scale of blackness was made on the same paper, through a square aperture, without shifting the lamp, the exposures being $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 4, and 8 sec. On developing it was apparent to the eye that the first band was much lighter than the second. The scale and blackness of the bands were measured accurately, and the times of exposure which had been given to each band, on the assumption that the law enunciated held good, was calculated and found to be for the first band 0·6 sec., and for the second band 0·91 sec., instead of 1·176 sec., which was really given in all. Another example is where the slit was open to 0·11in., and the time of exposure reduced from 20 to 10 min. It was found that in this case the exposures given on the same assumption were 3·7 sec. and 5·28 sec., the real exposure given being 5·36 sec. The last experiment shows that if the slit had been slightly wider, or the rotation slower, the law would have been approximately obeyed.

Another experiment was made by throwing an image of the crater of the positive pole of the electric light on a hole bored in a plate about $\frac{1}{20}$in. in diameter by means of a lens, and allowing the emergent beam to fall on the slit and paper, the drum being made to rotate as before. The same kind of results were obtained.

As it might be thought that this difference was caused by some action other than chemical, another series of experiments was undertaken. In these different sensitive surfaces were employed, in order to eliminate any possibility of the effect being due to any phosphorescence of the paper, though none could be detected. Plates were held stationary and exposures made by admitting light to portions of them through slits of known angular aperture, cut in a disc which could be rotated at any desired speed. Similar results were obtained to those already described. The quickest rotation gave the least density. It may be remarked that the more sensitive a surface is to radiation the less marked are the differences observable for the same speeds of rotation. This is what might be expected.

As an outcome of the experiments so far made, it seems that when exposures less than $\frac{1}{1000}$ sec. are made on a sensitive surface, and the source of illumination is an amyl-acetate lamp (Von Altneck's) placed 1 ft. from the sensitive surface, the law quoted *ante* fails.

The question of a very low intensity of light acting and of the sensitiveness to different spectrum colours is now occupying my attention.

## ROYAL INSTITUTION.

### THEORY AND PRACTICE IN ELECTRICAL SCIENCE.*

BY ALEXANDER SIEMENS, ESQ., M.INST.C.E. M.R.I.

When I was requested to give a Friday evening discourse at this Institution, I felt very much honoured at having an opportunity of speaking to an audience that has listened to so many illustrious men of science. At the same time I felt that instead of selecting a purely scientific subject, I should be more likely to interest you if I drew your attention to some illustrations of the way in which science is applied to practice.

The tendency of our century, and especially of the latter half, has been to obliterate ancient distinctions and to break down barriers which formerly were held to be insurmountable. In this respect I need only remind you that at one time, in chemistry, substances were divided into acids and bases, into metals and metalloids, and that until very lately in physics some gases were classed by themselves as being permanent, and so on. All of these distinctions have been found untenable in the light of modern research, and in a similar manner the strict divisions maintained for a long time between different branches of science have been more and more abolished, so that nowadays anybody who wishes to excel in any one branch of science ought to possess solid knowledge of the principles of all the others.

One of the most important barriers broken down by the spirit of our times is that formerly held up between science and practice, and the state of mind in which a learned professor once exclaimed about his own particular branch of science: "Thank goodness, there is no practical application of it possible," is more and more forgotten. Instead of that, endeavours are now made on all sides to turn to practical account all scientific investigations.

While quite admitting that it would give much cause for regret if this tendency were developed too far, so as to interfere with the progress of purely scientific researches, it cannot be denied that the application of scientific principles has brought about that immense progress which is characteristic of the last half-century. A conspicuous example of the influence of applied science is furnished by the way the use of electricity has been introduced into our daily life, and several causes have contributed to facilitate the scientific treatment of electrical problems. Not the least among these is the circumstance that at first electricity could not be produced at a cheap rate for general commercial uses. Thus it came about that telegraphy, for which weak currents are sufficient, was for a long time the only practical application, and during this period of comparative quiet a number of the most eminent scientific philosophers devoted their time to discover the characteristic features of this great power in nature, and the laws which it obeys. The consequence has been that at the time when the discovery of the dynamo-electric principle made cheap electricity a possible commodity, the laws on which electric currents act were thoroughly understood, and the development of the introduction of electrical appliances could take place on the firm basis of scientific knowledge.

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* Lecture delivered on Friday, February 3, 1893.

The obligations that electrical engineers owe to science they have acknowledged in a practical manner in naming the units by which electricity is measured after the learned men who created the science of electricity.

The circumstance that it is possible to reproduce perfectly the exact conditions for which electrical apparatus have been designed has much facilitated the direct application of laboratory experiments to practical problems. It is, for instance, quite feasible to take a small quantity of ore, to subject it in a laboratory to chemical and electrical treatment, and to judge from the results whether it will be possible to design works for the treatment of such ores in large quantities on the same lines. As far as electricity is concerned, it is possible in such cases to predict with absolute accuracy how much energy is wanted in each case to deposit a given quantity of metal in a given time. The electrical engineer is thus enabled to arrive, in a comparatively easy and inexpensive manner, at reliable data, which in other branches of applied science have to be obtained by costly experiments on a large scale.

One of the most striking instances of the direct application of scientific researches to practical purposes has been furnished by Dr. John Hopkinson, who explained in his lecture before the Institution of Civil Engineers in the year 1883 how he had been led by mathematical considerations to infer that alternate-current machines could be run in parallel, and what conditions were necessary to secure success. His conclusions were tried shortly afterwards at the South Foreland Lighthouse, and have proved since to be of the utmost value for central electric lighting stations on the alternate-current system. For the sake of historical accuracy I should mention, perhaps, that Dr. John Hopkinson called attention in the following year to a communication to the Royal Society by Mr. Wilde, who had previously demonstrated the possibility of working alternators in parallel; yet the facts just related are an apt illustration of the point I desired to lay before you.

While science is a safe guide for the engineer, and will warn him of the mistakes and fallacies which ought to be avoided, there are sometimes other considerations which will modify to an important degree conclusions based on scientific principles alone. As an example, the case of heating by electricity may be cited. The scientific data in connection with this problem are as follows: A kilogramme of coal burnt to best advantage will give 8080 calories. The same amount of coal consumed in a boiler will produce steam sufficient for 1 H.P. for 1 hour, and this horse-power can generate electricity at the rate of 660 watts, or about 570 calories, per hour.

Assuming that in heating by burning coal, only a quarter of the theoretical effect is attained, and taking the price of coal at 20s. per ton, while the cost of a Board of Trade unit of electricity is 8d., it would appear that a farthingsworth of coal will produce as much heat as 22d. worth of electricity.

These figures apply to the conditions of life in London, where fuel is abundant and power comparatively expensive; elsewhere, in Norway for instance, fuel may be expensive, and power, in the shape of waterfalls, cheap. Under such altered conditions electricity may with advantage be employed for heating purposes, by producing it with the aid of water-power, and utilising the heat generated by it, in special appliances.

One of the most important industries of Norway is the making of horseshoe nails, for which special machines have been constructed, into which a heated rod of iron has to be fed. For this purpose the rod is passed through a charcoal fire, placed close to the nail-making machine, and a great deal of difficulty is experienced in maintaining the rod at an even and suitable temperature. The apparatus placed in front of you is designed to replace these charcoal fires, and its construction is shown by the diagram on the wall. The essential part of it is a hollow carbon, through which a current of electricity is sent, heating the carbon to any desired temperature. In this apparatus, a current of 400 amperes and 5 volts is used, equal to two Board of Trade units per hour, which is supplied from a transformer, the primary circuit of which is connected to the high-pressure mains of the London Electric Supply Company. A diagram of the connection shows that the two wires connected to the supply main are led to a commutator on the table, by which the current can either be sent to the transformer of the heating apparatus, or to another one, which will be mentioned later on. In order to prevent loss of heat by radiation, the carbon is placed in a box filled with sand, and the necessary precautions are taken to let the current pass through the carbon only. After the carbon has become white hot, a rod of iron, in passing through it, is rapidly heated, and the temperature it attains depends on the speed at which it is fed forward.

It would have been very inconvenient to bring a nail-making machine here. With your permission, I will therefore ask Mr. Williamson, who designed the apparatus, to show us how to make spiral steel springs.

By the side of the nail-rod heater stands a similar apparatus for the heating of rivets, which is also illustrated by a diagram, and will be shown in action.

It is obvious that such an apparatus can be used in many places where a coal-fire would be dangerous, and that, considering the waste of fuel in the usual rivet-heating, it probably will be more economical in cost, especially where electric lighting plant is in use.

The ingenious way in which Mr. Crompton has utilised the heating effect of electric currents for cooking purposes has no doubt been admired by most of you at the Crystal Palace Exhibition last year; and when we remember that these cooking utensils consume fuel only during the time they are actually in use, and that they can be put in and out of action at a moment's notice, we cannot doubt that these and many other obvious advantages will facilitate their introduction in spite of the figures as to cost given by the scientific data.

Of late the transmission of power by electricity has occupied a very prominent place in the public interest, and the project of utilising the force of the Niagara Falls at distant towns is as closely discussed as the plan of constructing long railways on which trains are to run at fabulous speeds.

As you will hear a discourse on electric railways in three weeks from to-day, I will not take up your time with this branch of the subject, but will rather draw your attention to the distribution of power by electricity from a central generating station. Before entering further into this, let me remind you that the earliest magneto-electric machines were used nearly sixty years ago for the production of power. I will mention only Jacobi's electric launch of 1835 as an example; it must, therefore, be considered altogether erroneous to ascribe the invention of the transmission of power to an accident at the Vienna Exhibition in 1873, when, it is said, an attendant placed some stray wires into the terminals of a dynamo-machine; it began to turn, and the transmission of power was first demonstrated.

As a matter of fact, Sir William Siemens once informed me that his brother Werner was led to the discovery of the dynamo-electric principle by the consideration that an electro-magnetic machine behaved like a magneto-electric machine, when a current of electricity was sent into it, viz., both turn round and give out power. It was, of course, well known that a magneto-electric machine produces a current of electricity when turned by mechanical power, and Werner concluded that an electro-magnetic machine would behave in the same manner. We all know that he was right, but I relate this circumstance only as a further proof that the generation of power by electric currents had been a well-known fact long previous to the Vienna Exhibition.

Another well-known instance of transmission of power to a distance is furnished by the magneto-electric A B C telegraph instruments, where the motion at the sending end supplies the currents necessary to move the indicator at the receiving station.

*(To be continued.)*

# Provincial Transactions.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The fourth botanical excursion of the season was fixed for Wednesday, July 12, to Arthur Seat, at 8.30 p.m., but the weather turned out very wet. Nevertheless, the members who attended were rewarded by obtaining the following specimens not found in previous excursions:—*Aira cæspitosa*, *Aira flexuosa*, *Campanula rotundifolia*, *Carduus lanceolatus*, *Crepis hieracioides*, *Hieracium Pilosella*, *Hieracium umbellatum*, *Juncus effusus*, *Pimpinella saxifraga*, *Senecio viscosus*, *Sisymbrium officinale*, *Sonchus oleraceus*, *Thymus serpyllum*, and *Trifolium procumbens*.

## EDINBURGH PHARMACY ATHLETIC CLUB.

The Edinburgh Pharmacy Athletic Club held their Midsummer Golf Competition at Largs. The scratch prize was won by Mr. P. W. Wilson; Mr. Jas. D. Horsburgh won the 1st handicap prize; Mr. A. J. Dey and Mr. J. W. Simpson won the 2nd and 3rd respectively.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACT.

At Ripon County Court, on Saturday, July 15, before his Honour Judge Turner, the Council of the Pharmaceutical Society of Great Britain, through Richard Bremridge, the Registrar of the said Society, sued Joseph Topham Verity, of Pateley Bridge, wine and spirit merchant, for £15, the particulars of the claim being as follows: The amount of a penalty incurred by the defendant on April 28, 1893, in keeping open shop for the retailing, dispensing, or compounding of poison, to wit, a preparation of morphine called chlorodyne, contrary to the provisions of the Pharmacy Act, 1868, 31 and 32 Vict., cap. 121, £5; for the amount of a penalty incurred by the defendant on May 10, 1893, in keeping open shop for the retailing, dispensing, or compounding of poisons, to wit, a preparation of morphine called chlorodyne and a preparation of opium called laudanum, contrary to the provisions of the said statute, £5; for amount of a penalty incurred by the defendant on May 10, 1893, in taking, using, or exhibiting the name or title chemist or druggist, contrary to the provisions of the said statute, £5.

Mr. T. R. Grey, instructed by Messrs. Flux, Son and Co., solicitors, 3, East India Avenue, London, was for the plaintiffs, and Mr. C. Mellor, instructed by Mr. Atkinson, solicitor, Bradford and Pateley Bridge, was for the defendant.

Mr. Grey, in opening the case, said he appeared for the Pharmaceutical Society, who were suing Joseph Topham Verity, the defendant, for three penalties, two being for keeping open shop for the sale of poisons and one for assuming the title of chemist and druggist, contrary to the Pharmacy Act, 1868. It would be seen from 31 and 32 Vict., cap. 121, sec. 1, that from and after December 31, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding of poisons, or to assume or use the title chemist and druggist, or chemist or druggist, in any part of Great Britain, unless such person shall be a pharmaceutical chemist or be a chemist and druggist within the meaning of this Act, and be registered under the Act, and conform to such regulations for selling poisons as may be prescribed by the Society or the Privy Council. Section 2 said that the articles named in schedule A shall be deemed poisons within the Act, and also that the Council of the Society might by resolution add other poisons to the Schedule with the approval of the Privy Council, resolution being advertised in the *London Gazette*. If his Honour would refer to schedule A, page xx., of the Register, he would find the words "opium and all preparations of opium" in part 2. And on page xxiv., dated December 20, 1869, a resolution was recorded holding that preparations of morphine should be added to the schedule. These were the two poisons dealt with in that case.

His Honour: Have these been properly approved by the Privy Council?

Mr. Grey: Yes.

His Honour: Have you got the *London Gazette* here?

Mr. Grey: Yes, we have. I will put it in.

Mr. Mellor: I will admit, for the purposes of the inquiry, that Verity, the defendant, is not registered, but that he keeps a qualified assistant, who has the entire control and management of this department.

Mr. Grey: As I understand it is admitted that defendant is not registered, I will refer you at once to section 15.

His Honour (to Mr. Mellor): Preparations of opium and morphine are scheduled under the Act. Do you admit that?

Mr. Mellor: That seems to be so.

His Honour: Do you admit it?

Mr. Mellor: I don't admit that what we sold are poisons. I admit that morphine, for instance——

His Honour: I ask you whether preparations of opium and morphine come within the Act.

Mr. Mellor: Preparations of morphine seem to do. Yes, I am afraid I must admit that according to the schedule.

Mr. Grey then called his Honour's attention to section 15, which provided that from and after December 31, 1868, any person who shall sell, or keep open shop for the selling, compounding, or dispensing of poisons, or who shall take, use, or exhibit the name or title chemist and druggist, not being a duly registered chemist or druggist, or who shall take, use or exhibit the title of pharmaceutical chemist, or shall fail to conform to any regulation for the keeping or selling of poisons, shall for every such offence be liable to a penalty of £5, and the same may be sued for and dealt with as provided under the Pharmacy Act.

His Honour: Which is the Pharmacy Act?

Mr. Grey referred his Honour to the 15th and 16th Victoria, cap. 56, section 12, where it was set out that action should be taken in a court for the more easy recovery of small debts.

His Honour: Is there any Act in force for the more easy recovery of small debts?

Mr. Grey: Yes, the County Court, which has exclusive jurisdiction under this Act.

His Honour: Since 1888?

Mr. Grey: There is no other Court for the easy recovery of debts.

His Honour: There are other Courts for the recovery of small debts.

Mr. Mellor pointed out that some of the penalties, under section 17, for instance, were recoverable before the magistrates in a summary way.

Mr. Grey: Section 17 is a different action altogether; that is before the magistrates.

His Honour: Have you the Act of 1888?

Mr. Grey: I am afraid I have not got it here.

His Honour: It is an Act to amend the County Court Act. It is not an Act for the more easy recovery of small debts.

Mr. Grey: We are to sue under any Act for the more easy recovery of small debts and demands. The facts of the case are shortly as follows:—On April 28, 1893, a bottle of Dr. Collis Browne's chlorodyne was sold at the defendant's shop, and with that bottle were certain wrappers, at the bottom of one of which would be seen "Joseph Topham Verity, Proprietor, New Drug Stores, Pateley Bridge." On May 10 another purchase was made of Dr. Collis Browne's chlorodyne, and also laudanum. With these further wrappers were supplied, and one of them contained this: "Sold by J. T. Verity, Chemist, Druggist, Wine and Spirit and Cigar Merchant, New Drug Stores, Pateley Bridge, agent, etc." With this a receipt was given to the purchaser, and on that also was, "Bought of J. T. Verity, Druggist, Wine, Spirit and Cigar Merchant, etc." The analyst would be called before his Honour, who would prove that the bottles produced contained the poisons mentioned in the Act. The defendant had admitted the fact, but it would be necessary to put in the Register to show the absence of his name.

His Honour: The register is *prima facie* evidence?

Mr. Grey: Yes. If these facts were proved he would ask his Honour to give a verdict for the three penalties for which defendant was liable. The defence, as he understood it, was that he had a qualified manager. That under the Act was not sufficient.

His Honour: Is it not?

Mr. Grey: Any person who keeps open shop has to be qualified, whatever the manager is.

His Honour: What about stores?

Mr. Grey: There is the case of the Pharmaceutical Society *versus* the London and Provincial Supply Association, which was carried to the House of Lords, where it was decided that a "person" under the Pharmacy Act did not mean a corporation, it must mean an individual person. Owing to the omission from the Act of the words "including corporation" the Association was held not to be liable, and that they could not be sued.

His Honour: Had the Association a fully qualified person?

Mr. Grey: It had a duly qualified person, and it was said that if it had not been a corporation, each unqualified shareholder would have been liable to a penalty under the Act. A very similar case was tried at Manchester in the month of June, the case of Messrs. Lewis.

Mr. Mellor: That was only a County Court Judge.

His Honour: We don't allow County Court Judges to be cited as authorities.

Mr. Grey: No, we may simply state what was done before the County Court Judge.

His Honour: I don't know who the County Court Judge is?

Mr. Grey: Judge Heywood. There we sued two partners, one of whom——

Mr. Mellor: I object to my friend going into this.

His Honour: He may recite it if we don't take it as an authority. Were you present?

Mr. Grey: Yes. It is personal knowledge. I was acting for plaintiffs on that occasion. There the one partner was qualified and the other was not, and it was held that both ought to be qualified under the Act. Mr. Grey also called attention to the case of the Pharmaceutical Society *v.* Piper, which was carried to the Divisional Court, where it was held that Dr. Collis Browne's chlorodyne was a poison within the meaning of the Act. The point was that poison entered as an ingredient into the substance, and the question was whether that constituted a poison within the meaning of the Act, and the Court decided that it did. The other point decided in the case of Piper was whether Dr. Collis Browne's chlorodyne came within section 16 as a "patent" medicine. It was decided that a patent medicine was a medicine under letters patent, and that Dr. Collis Browne's chlorodyne was not so.

On the first witness being called, his Honour wished to know whether there would be an appeal, as this would affect his manner of taking notes.

Mr. Mellor: I think we shall be bound by your Honour's decision.

His Honour: Do you agree not to appeal?

Mr. Grey: No.

Mr. Mellor: As far as we are concerned we should not object to appeal.

Mr. Grey: We are bound to appeal.

Mr. Mellor: They are a powerful body; they like the House of Lords.

Arthur Foulds, private inquiry agent, carrying on business at Salford, Manchester, was then called, and stated that on April 28 he went to defendant's shop at Pateley Bridge. There was over the shop "J. T. Verity, New Drug Stores." He went inside and asked for a small bottle of chlorodyne. The bottle produced was given to him. He identified it by the mark he put on it. He received two wrappers with the bottle. The wrappers were then put in. These wrappers were round the bottle. On May 10 he went again to defendant's shop and asked for another bottle of chlorodyne. The bottle produced was the one. There was a small wrapper round it. This bottle witness marked, as in the previous case, on the label the name of J. T. Verity and the date. One of the wrappers was an advertisement of "Horniman's Pure Tea." On May 10 he also purchased laudanum. He asked for two pennyworth of soap liniment and two pennyworth of laudanum mixed.

His Honour: You did not ask for laudanum?

Witness: No sir. They were served in the bottle produced.

His Honour: Were they mixed in your presence?

Witness: Yes, the laudanum and soap liniment. I saw him pour the two things in from bottles. The wrapper produced was round the bottle.

Mr. Grey did not think that some of the wrappers amounted to much, because defendant admitted that he was proprietor of the shop.

Mr. Mellor: That is so.

Mr. Grey pointed out that the "Horniman's Pure Tea" wrapper had on the bottom these words, "Sold by J. T. Verity, chemist, druggist, wine, spirit, and cigar merchant, New Drug Stores, Pateley Bridge."

His Honour: Where was that?

Witness: Wrapped round the liniment bottle.

His Honour: You marked all the wrappers?—Yes.

Witness, in answer to Mr. Grey, also stated that with the liniment and laudanum he got the receipt produced. This also included the chlorodyne purchased on May 10. The receipt which bore the words "J. T. Verity, druggist," was then put in. Witness also stated that he handed over the bottles to Mr. Moon, of the Pharmaceutical Society.

Cross-examined by Mr. Mellor.—Do you know whom you saw in the shop?—Yes.

Was this the gentleman (indicating a person in court) ?—Yes.

His Honour: Who is he ?

Mr. Mellor: He is defendant's manager, Mr. Alfonso de Lamartine Thompson. He has been duly registered as a qualified chemist.

His Honour (to witness): Did you see him in both cases ?

Witness: Yes.

Mr. Mellor: You told his Honour just now that over the door was put up "New Drug Stores." Is that so ?

Witness: Verity, "New Drug Stores."

Mr. Mellor: Is there not also put up "wine and spirit merchant?"—I could not say if "wine and spirit merchant" was up. I am inclined to think so.

Mr. Mellor: You are retained by the Pharmaceutical Society, and go and buy these various things in the numerous actions they bring. Was this the first one ?—No.

You are one of the company on tour ?—Yes.

When business is slack you make a raid on this sort of people ?—Yes.

Mr. Mellor: Sort of "A 1" company; very well.

His Honour (to witness): This is not the first time you have been to buy for the purposes of the plaintiffs. That is what you say ?—Yes, sir.

Mr. Mellor: You have been in other counties besides Yorkshire ?—Lancashire.

Just now it is a little circle round Yorkshire that the company are touring ?—I cannot say.

It depends on the time of the year what part of England they go to ?—I cannot say.

Harry Moon was next called, and stated he was a clerk in the office of the Registrar of the Pharmaceutical Society. He received the bottles and wrappers produced from the last witness. He handed them over to Mr. Eastes for analysis as he received them.

Mr. Mellor: Who is the Registrar of your Society now ?—Mr. Richard Bremridge.

Was any resolution passed authorising Mr. Bremridge to take action in this matter ?—Yes.

Have you a copy of that resolution ?—I have the sealed authority authorising proceedings to be taken.

His Honour: Bring your sealed authority forth.

Witness produced the authority, and swore to the seal as that of the Pharmaceutical Society.

Mr. Mellor, reading the document to himself, said it contained very important secrets. (To witness), This is a copy of the resolution ?

Witness: It is a copy of the resolution.

Mr. Mellor asked if that was the only one in existence, because it said that "a copy of the same be sealed." Where was the original ?

Witness said the original was with the Society in Bloomsbury Square.

Mr. Mellor: I apprehend that the original should be here.

His Honour: I have not heard why anything should be here. There may be some rule in the Act.

Mr. Mellor: The Act sets out——

His Honour (interrupting): That will come on later.

Ernest John Eastes, analyst and Fellow of the Institute of Chemistry, assistant to Professor Attfield, Professor of Practical Chemistry to the Pharmaceutical Society, stated the bottles produced were handed to him by the last witness. He analysed the bottle of chlorodyne purchased on April 28. He found morphine in it. He also analysed the bottle of chlorodyne purchased on May 10. That also contained morphine, which was a poison within the meaning of the Pharmacy Act.

His Honour (to witness): What is morphine ?—It is the active principle of opium. Laudanum is tincture of opium. Laudanum is opium and spirit; a preparation of opium?

His Honour: What necessity was there for the second resolution (December 20, 1869) if morphine has opium in it. Why did it not come in the first Act ?

Witness stated that morphine was a preparation of opium. Opium was one thing and morphine was extracted from it.

Mr. Mellor: The first Act includes laudanum.

His Honour: Is not morphine in the first Act ?

Mr. Grey: The first Act does not include preparations of morphine.

His Honour: But morphine is a preparation of opium.

Witness: That is so, but the second Act made it doubly sure. I should hold that morphine is a preparation of opium.

His Honour: I have always thought so. Don't you give injections of opium ?—No, morphine.

His Honour: You found morphine in both these bottles ?—Yes.

And the active principle of opium is morphine ?—Yes.

You get it from poppies ?—The opium is got from poppies and morphine from the opium.

His Honour: Morphine never was opium because it never came into the state of opium; it is stopped before it gets there ?

Witness: You get opium from poppies. You first get the opium, you cannot get morphine straight from poppies.

Mr. Mellor: It is making confusion worse confounded.

Mr. Grey (to witness): What did you find in the other bottle ?—Tincture of opium, that is laudanum ?

Cross-examined by Mr. Mellor: Do you think this resolution of the Pharmaceutical Society with regard to morphine was quite unnecessary ?—I don't say that.

Is Dr. Collis Browne's chlorodyne a patent medicine ?—It is a proprietary medicine.

Have you searched the patent medicine records to find if it is a patent medicine ?—No.

It has a stamp upon it the same as patent medicines ?—Yes, and other medicines besides patent medicines have.

Now, with regard to this medicine, you traced morphine in it ?—Yes.

A very small quantity ?—No, a large quantity.

His Honour: What proportion ?—A couple of grains to the ounce.

Mr. Mellor: How many ounces are there in this bottle ?—Half an ounce.

His Honour: An ounce is how much ?—About 440 grains.

Mr. Mellor: The bottle contains half-an-ounce, and there will be one grain of morphine in it ?—Yes.

His Honour: How much morphine will kill a man ?—Half a grain.

Mr. Mellor: If not diluted ?—That makes no difference.

If anyone drank the whole of the bottle ?—I would not care to be responsible in that case.

Mr. Mellor: I have taken a good deal of it.

Witness: Half a grain will kill, and one grain is an ordinary fatal dose.

Mr. Mellor: It says on the bottle, "thirty drops to be taken every three or four hours." It is required to be labelled "poison," so that everything has been conformed to.

His Honour: Is it a fact that it has morphine on ?

Mr. Mellor: Yes. And it is stamped the same as patent medicines.

His Honour (reading from the label on the bottle): "This is a preparation containing, amongst other ingredients, chloroform and morphine, and the law requires it to be labelled 'poison.'"

Mr. Mellor (to witness): Is chloroform poison ?—Yes.

Is it scheduled in the Act ?—Yes.

His Honour: What is the difference between Part I. and Part II.?

Mr. Grey stated there were special regulations with regard to Part I., because they were poisons more dangerous than others. Under section 17, one could not buy a poison in Part I. of the Schedule unless he was known or someone went to introduce him.

Mr. Mellor: Chemists often sell opium to children, but under Part II. they have not to give an address.

Mr. Mellor (to witness): This is a liniment with laudanum in it?—Yes.

How much laudanum?—I cannot tell exactly, but a fair quantity, perhaps a third. The other ingredient was soap liniment.

His Honour: What is soap liniment?—It is soap, camphor, and oil of rosemary, dissolved in weak spirits of wine.

His Honour: You say only one third of laudanum? —Yes; that is with regard to the money paid for it. Of two pennyworth each, soap liniment and laudanum, about one third is laudanum.

Mr. Mellor: This is a prescription evolving from the brain of a detective of the Pharmaceutical Society. Is it a common thing?

Witness: It is very frequently used.

Mr. Mellor: What is it used for?—External purposes.

His Honour: Is it constantly used with laudanum? —Yes, but not so frequently as soap liniment alone.

Is it commonly used?—Yes.

Mr. Mellor: What is the advantage of laudanum with soap liniment?—It is more soothing.

Mr. Mellor said that some of his questions were not directed so much on the point of absolute defence as to show that it was a mild case of evasion of the Act, if there was any evasion at all.

His Honour: Shall I have power to modify the penalties?—Mr. Grey expressed negation.

Mr. Mellor: You may have power over something else. Defendant announces not only that he is a wine and spirit merchant, but "New Drug Stores, A. Thompson, chemist, manager."

His Honour: That is not on these other things.

Mr. Grey: No, the two bottles were in the usual chlorodyne covers.

Mr. Mellor: They are sold really as patent medicines. Whether they are or not I don't know; you can get them anywhere.

Mr. Grey said that was his case, and he then handed to his Honour the decision in the case of the Pharmaceutical Society *v.* Piper, which his Honour considered for a time.

His Honour did not see why a person should not make a mistake in a patent medicine as well as in a proprietary medicine.

Mr. Mellor: A patent medicine would not be made on the premises.

His Honour: I don't see the force of the argument.

Mr. Grey: Proprietary medicines are not disclosed.

His Honour: I don't see why a person should not make a mistake in compounding a patent medicine as well as a proprietary article.

Mr. Grey: There are very few patent medicines proper. I think I am safe in saying there is not one at present which contains a "poison."

Mr. Mellor: You mean there are not many patent medicines that have poison in.

His Honour: No. Patent medicines, in the sense in which the word is used here. What is the form of a patent medicine; do you have to apply for a patent for it?

Mr. Grey: The ingredients are set out under letters patent, the same as a machine or any other thing.

Mr. Mellor, for the defence, said he thought it was better his Honour should have all the facts before him, because in all those cases there were certain degrees connected with the business carried on that might make it very serious and that might have other effects. He was going to suggest that, supposing defendant was liable in that case, it was never intended that a man who had taken the precautions defendant had done should be brought under the penalties of that Act. The case that had been alluded to, the Pharmaceutical Society *v.* the London and Provincial Supply Association, finally reached the House of Lords, and no doubt the question there decided was a very curious point, and showed how technical and difficult it was for outside people to understand the operations of a technical society. If his Honour remembered, they there held that although a person under certain circumstances might come within the mischief of those Acts, yet if that person chose to associate himself with somebody else and become registered as a company, then he might do almost anything he liked. That was what it came to.

His Honour said that the Interpretation Act of 1889 laid down that in certain cases the word "person" should include "company." He did not know whether it would apply in such cases as that before him. He had not a copy of the Act.

Mr. Mellor, continuing, said that those Acts had been passed for special purposes, and for the protection of the public generally, and had rather severe penalties attached to them, so that if it had been intended that the word "person" should include "corporation" it would have said so distinctly. They said that inasmuch as a corporation could not perform certain conditions that a person could do, that therefore a corporation could never be intended to come within the Act. Defendant could, within the next few days, make himself into a registered company, and then there would be no need for anyone going round on a "starring travelling tour." Cases like that before his Honour were never intended to be brought into court; the Act was meant to prevent the sale of drugs by unqualified people.

His Honour: Do you think a person should turn himself into a company after this (the Interpretation Act).

Mr. Mellor: The Pharmaceutical Society has never instituted any prosecution since it has passed.

His Honour: It was only passed in 1889.

Mr. Mellor: They would have to go to the House of Lords to get a decision. He submitted that the Interpretation Act did not apply in that case. If "company" was included in the word "person" his Honour would have the whole of his time occupied in hearing cases against companies, and he would be imposing on himself an immense amount of work by giving that as a serious judgment. He would have the pleasure of having Taylor's Drug Stores before him, and that in all its branches would occupy the whole of his time. If his Honour would allow him he would read part of the Lord Chancellor's (Selborne) judgment in the case of the London and Provincial Supply Association. The question was discussed as to how far a corporation as applied to that Act could mean a person. The Lord Chancellor said: "The conclusion, therefore, which I come to is that these words, 'unless and so on,' are inapplicable to any corporation; that there being not a general prohibition of trade or business, but merely a declaration that it shall be unlawful for a person, unless he complies with certain conditions, to carry on these otherwise lawful trades or businesses, not only keeping a shop for retailing poisons or selling poisons, but also to assume the title of chemist and druggist, or chemist, or druggist, I cannot myself but think that it is a sounder construction of the word 'person' to hold that only such persons are contemplated as might by taking proper means comply with the condition, and so enable them to carry on the trade."

Mr. Grey, in answer to his Honour, said that in that case (Pharmaceutical Society *v.* London Supply Association) the decision was first of all in favour of the Society. The Queen's Bench decided also in favour of the Society. The Court of Appeal was against the Society, and that decision was confirmed against the Society on appeal to the House of Lords.

Mr. Mellor submitted that these conflicting opinions had been going on by stages up to the House of Lords, and they had left the case in a great muddle. No doubt Mr. Grey would argue that in order to comply with the conditions a person must pass the test examination and become a duly qualified chemist, but what the condition of the Act of Parliament contemplated was that anyone who sold the drugs or poisons scheduled in the Act should have a duly qualified person to manage that department of the trade. Mr. Verity never interfered in that part of the business. The detective, who was in the box, had admitted that on the particular days for which penalties were sued for the manager, who would be called before his Honour, and who was a duly qualified practitioner, was the person by whom the bottles of chlorodyne and the laudanum mixture were sold. He did not think the decision of the House of Lords went so far as to say that if a man employed a duly qualified person that he came within the mischief of the Act, because he employed that person for the safeguard which the Act contemplated. Take, for instance, this: supposing there was a duly qualified chemist—we knew that chemists' assistants were not duly qualified——

His Honour: They may be.

Mr. Mellor said he should think—though he was not an authority—that, to judge from the juvenile appearance of many chemists' assistants, particularly in the country villages, it would be the exception if they were duly qualified. If the Act of Parliament was to have the narrow construction his friend wished to put upon it, in order to bring Mr. Verity within its mischief, then every chemist's assistant in the kingdom would be liable. That showed that a more liberal construction must be put upon the Act, which was never intended to meet such a case.

His Honour: I don't see what objection there is. Supposing the head man is duly qualified, why should the chemist's assistant be brought in.

Mr. Mellor: Because he might be the person selling when the chemist is away.

His Honour: Would he be entitled to sell?

Mr. Mellor: Not one business of a chemist in this country could go on if he did not. It is done every day. Mr. Mellor went on to say that the whole intention of the legislature was to protect the public from incompetent persons. The case of Mr. Verity was a better one than that of a chemist who had an unqualified assistant. Mr. Verity would tell the court that he was travelling about the country paying attention to that branch of his business which was connected with the wine and spirit trade, and he left a qualified chemist in the shop—who was never away—to dispense drugs and poisons, which he also sold. He did not know what the intention of the Act might be as to keeping a house for the sale of drugs.

His Honour: The words are "keep open shop."

Mr. Mellor: Quite so, but the primary business of Mr. Verity is that of a wine and spirit merchant.

His Honour: "Keeping open shop, retailing or dispensing poisons."

Mr. Mellor thought if the Pharmaceutical Society took up all the cases there were of that sort life would not be long enough to try them. It did seem to him that when Mr. Verity had a qualified man, and when he would be protected by turning himself into a company, it was not the sort of case that should be instituted. If he remembered correctly, in the case before the House of Lords they said that if they found that a company employed a person who was not qualified to sell drugs and things of that sort, then the doctrine of *qui facit per alium facit per se* would apply, showing throughout the whole of their argument that what they had before them was that the Act was intended to apply to cases where a person kept a man who was not qualified, or kept a place for the sale of drugs which he himself as an unqualified person dispensed, because the two things must go together. He must keep the shop open and must be the actual seller.

His Honour: No; distinctly it is not so. The Act says, "It shall not be lawful for anyone to sell or keep open shop." If he sells he commits an offence against the Act, or if he keeps open shop.

Mr. Mellor said he wished to tell his Honour what he could prove, and he did not think Mr. Grey would seriously contradict it, because it was not part of his case to do so. As a matter of fact, Mr. Verity had a manager, Mr. Alfonso Thompson, who conducted the whole of the business in the drug department. In that he was corroborated by the detective, who said when he went to the place Thompson sold him the drugs. That was his case, and if his Honour thought that, notwithstanding that, it would not bring him out of the mischief of the Act, he would ask him in that case—because he had power in all cases where he saw a state of uncertainty as to whether chlorodyne was a poison within the meaning of the Act, and the uncertainty as to "qualified person" which might lead a man to think that what Taylor's Drug Stores could do as a company he could do as an individual, and therefore he kept a qualified assistant—he would ask his Honour to say that although Verity had brought himself within the mischief of the Act and was liable to pay those penalties, taking all the circumstances into consideration, the uncertainty of the law, and the fact that in that particular instance Verity had provided a qualified assistant so that there could be no mischief done to the public, that although judgment might be given against him as far as the penalties were concerned, yet that he would say that it was not a case in which he could award costs. He understood the penalties went to the Treasury.

Mr. Grey, in answer to his Honour, said that was so. It was provided in section 14 of the Pharmacy Act, 1852, that penalties are to be paid as Her Majesty's Treasury shall direct.

Mr. Mellor said he could prove the statements he had made if necessary, but he thought it was idle for him to keep up the case after his Honour's remarks. He would ask him, however, not to give costs.

His Honour, in giving judgment, said the Act of Parliament seemed to be express upon the point, notwithstanding defendant had a duly qualified assistant. It said simply "any person who shall sell." Probably it might be a question whether he did actually sell so as to come within the term, when he had a qualified assistant who sold for him. But the Act went on to say, "or shall keep open shop for the retailing, dispensing, or compounding of poisons." He was not actually dispensing or compounding poisons to so many people, but he retailed poisons—there were two before him, and he must assume defendant kept them wholesale and sold them separately. Therefore on two different occasions he kept open shop for the retailing of poisons, taking the word poison to have the meaning attached to it in the schedule. Therefore it appeared to him that he had brought himself clearly under that part, and the plaintiffs were entitled to have judgment against him. The only other question was whether he had used the title chemist and druggist; and on one of the wrappers there was the name "Verity, chemist, druggist." Another one had only "druggist." (Mr. Grey: the receipt is only druggist). Druggist, wine and spirit merchant, agent for wines and stout. Some persons thought those were poisons. Defendant had assumed the title of druggist, and the decision was against him on that point also. He did not see what answer there could be. He did not think it was a case in which he ought to make any alteration in the usual law that costs follow the decision.

Mr. Mellor: The result of your Honour's decision will be that there will be a wholesale turning of shops into companies, and considerable mischief may result.

His Honour: It may or may not.

Mr. Grey: That will not alter the action of the Society.

His Honour: Verdict for the plaintiffs for £15 and costs.

### Prosecution under the Food and Drugs Act.

#### THE COMPOSITION OF MALT VINEGAR.

At Glasgow, on Wednesday, July 12, before Sheriff Birnie, Kennedy Campbell, grocer, was charged with selling as "malt vinegar" what, on analysis, proved to be diluted acetic acid only. Evidence was given to show that it did not contain matters that ought to be present in malt vinegar, but in defence it was urged that it was distilled from malt vinegar, and, though colourless, was yet correctly described as such. It was said to be preferred to brown vinegar in Scotland. His Lordship, in giving judgment, said he thought that the prosecution had been most valuable, as showing the public what they did not probably know before. But his opinion was that he was not entitled to say that vinegar distilled from malt was not malt vinegar, and therefore he must assoilzie the respondent.

### Sale of Saltpetre for Epsom Salts.

William Fraser, slater, 100, Cornwall Street, Govan, sent his girl on Tuesday night for a halfpenny worth of Epsom salts from Thomas Pollock, grocer, 96, Cornwall Street, Plantation. This dose was taken by Mrs. Fraser, who immediately afterwards turned ill, and began vomiting violently. The husband went at once for another dose, and, on questioning the grocer regarding the matter, the latter admitted having mistaken the drawer, giving saltpetre instead of Epsom salts. The woman is in a dangerous condition, and is being attended by several doctors.—*Edinburgh Evening News.*

### Poisoning by Oxalic Acid.

On Wednesday afternoon Dr. Danford Thomas held an inquest at the Paddington Coroner's Court on the body of John Edgeley, aged 42 years, a cabdriver, of 19, Braden Street, Shirland Road, Paddington, who died from taking oxalic acid purchased at an oilshop. The packet containing the poison bore no label. At the conclusion of the evidence, the Coroner said that, as the poison was purchased at an oilshop, the shopkeeper was not bound by law to label such; but if purchased at a chemist's, then the chemist, under the provisions of the Sale of Poisons Act, was bound to label it "Poison." Oilshop keepers were not bound to do so, though some did take such precautions. He had known many persons to get poisoned by drinking from bottles that contained poisons in mistake for other things. The jury returned a verdict of "Accidental death," thinking that the deceased had taken the oxalic acid in mistake for Epsom salts.—*Echo.*

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Copies of the following newspapers, with marked paragraphs, have been received:—*Glasgow Herald, Nottingham Evening Post, Liverpool Post, Yorkshire Herald.*

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Communications, Letters, etc., received from Messrs. Corder, Dott, Gill, Lee, Smith, Squire, Thompson.

## Obituary.

Notice has been received of the death of the following:—

On the 4th of July, George Maston, Chemist and Druggist, Hartlepool. Aged 54 years.

On the 7th of July, Frank John Botham, Chemist and Druggist, London. Aged 41 years.

On the 9th of July, James Adams, Chemist and Druggist, Brixton. Aged 54 years.

On the 10th of July, William Foster Smith, Chemist and Druggist, Billingborough. Aged 73 years.

On the 10th of July, Augustus Baker, Chemist and Druggist, late of Downham Market. Aged 61 years.

On the 11th of July, Henry Charles Glanville, Chemist and Druggist, late of Nice. Aged 32 years.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### The Medicine Stamp Duty.

Sir,—If Mr. J. A. Forret will adopt the following label, I think he will find on inquiry at Somerset House that he will not be compelled to adopt such "a monstrosity in grammar as Blaud Pills." "Ferruginous Pills (Blaud's Formula). Dose.—2 three times a day." I forwarded it some time ago to the Board of Inland Revenue, and it was returned marked "not liable to duty."

*Southport.* Geo. Crook.

*Aliquis.*—Such practices as you describe are extremely objectionable, but it is doubtful if any good purpose is served by publishing comments upon them. The most satisfactory plan, in our opinion, is to persist in the endeavour to cultivate friendly relations with medical practitioners.

## NOTICES OF MEETINGS NEXT WEEK.

### Tuesday, July 25.

*Photographic Society of Great Britain.*

Technical Meeting, at No. 50, Great Russell Street. "The Use of Uncorrected Microscopic Objectives with Colour Corrected Plates." Mr. Pringle will introduce the subject and show specimens.

### Wednesday, July 26.

*Edinburgh Chemists' Assistants' and Apprentices' Association.*

Botanical Excursion to Craigcrook. Leave Princes' Street Station at 5.45 a.m.

## BOOKS, PAMPHLETS, ETC., RECEIVED.

The Law of Cremation. An Outline of the Law Relating to Cremation, Ancient and Modern, together with the Rules and Regulations of various Cremation Societies at Home and Abroad. By Aubrey Richardson. Pp. i.-iv., 1 to 187. London: Reeves and Turner. 5s. From the Publishers.

Practical Dentistry, Surgical and Mechanical. By a Dental Surgeon. Illustrated. London: Offices of the *British and Colonial Druggist.* Pp. 94. From the Publisher.

Handwörterbuch der Pharmacie. Part 10. Edited by A. Brestowski. Vienna and Leipzig: Wilhelm Braumüller. From the Publisher.

Chemistry for All. By W. Jerome Harrison, F.G.S., and Robert J. Bailey. London: Blackie and Son, Limited. Pp. i.-iv., 1 to 150. 1s. 6d. From the Publishers.

## "THE MONTH."

**Mexican Valerian.** R. McLaughlin describes this variety of *Valeriana officinalis* as a beautiful herbaceous plant, common in the woods and damp places of Eastern Mexico. The roots, as found in the Mexican markets, occur in slices or fleshy discs from half to one and a half inch in diameter, or the whole tubers may be offered. These are very large, greyish externally, yellowish internally, hard, and tough. They have a granular fracture when dry, and possess an unpleasant odour and bitter taste. On analysis a specimen was found to yield volatile oil, 3·33 per cent. ; oleo-resin, 4·30 ; wax and fat, 1·09 ; valerianic acid, 0·91 ; mucilage, 4·50 ; pectin, 1·35. There were also distinct quantities of a glucoside separated in a crystalline condition, on pouring a concentrated alcoholic extract of the drug into acidulated water and agitating the clear filtrate with ether. The commercial European valerian yielded similar crystals under the same conditions, although in less quantity. By distilling some of the coarsely powdered Mexican root with water confirmation was obtained of the large proportion of volatile oil it contained, 3·33 per cent. being the minimum proportion present, apart from that contained in the oleo-resin (*Am. Journ. Pharm.*, lxv., 329).

**American Ginseng.** The root of the ginseng plant occupies an important place in the Chinese materia medica because of its tonic and stimulant properties. It has an aromatic bitter-sweet taste, and is somewhat mucilaginous. Corean ginseng (*Aralia quinquefolia*, var. *Ginseng*, Reg. et Mack) is most esteemed, but the produce of the American plant (*A. quinquefolia*, A. Gray) is largely used as a substitute for it. This root is tuberous, three or four inches long, and usually branches into two or three tap-shaped divisions. It is wrinkled by parallel transverse ridges, gives rise to a number of fibrous rootlets, and the upper portions of the tuber show several angular scars, the remains of withered stems. The older roots often assume strange forms, and are highly prized accordingly, large sums being readily given by the Chinese for such. The plant has not so far been cultivated, except experimentally, and the search for the wild roots is very keen, both in the United States and Canada. Indeed, in the province of Ontario it has been found necessary to preserve it from extinction by special legislation (see *Pharm. Journ.*, [3], xxiii., 952). The price realised for the dry roots has ranged from three to three and a half dollars per pound, and the quantity exported from Canada in 1890 is stated to represent one hundred thousand dollars. The question of cultivation is now under consideration, and seeds have been received at the Royal Gardens, Kew, for experimental purposes (*Kew Bulletin*, 76–77, 71).

**Y-DZI.** Seeds of the grass known by this name in Annam, French Cochin-China, and Tonquin, and also called *bobo* in the Annamite dialect, have been received at Kew and are found to very closely resemble those of *Coix gigantea*, Roxb. These seeds, stripped of their husks, are used as food, being either parched, made into a refreshing beverage, or a nutritious soup. In addition, they are said to possess peculiar medicinal properties. Travellers use them in the same manner as tea to purify unwholesome water, and they are said to have a beneficial effect in liver disease, to purify the blood, invigorate the stomach, and act as a diuretic. When grown in miasmatic regions the plant is described as exerting a beneficial effect similar to that of eucalyptus trees. The results of chemical analysis indicate nothing peculiar beyond a slight increase in the amount of oil or fat present over that found in the great majority of cereals, and the plant is probably a form of the Indian *Coix gigantea*, which produces a grain that resembles pearl barley, and has long been known to yield "an excellent diet drink for hospital patients in China" (*Kew Bulletin*, 76–77, 76).

**Borneo Gambier.** An attempt has been made to establish the cultivation of gambier in British North Borneo, and the first sample received, though in a mouldy and dirty condition on account of improper packing, was shown to contain 19·86 per cent. of tannin. Properly dried and prepared material indicated as much as 27·85 per cent., and as a result of this encouraging report, the cultivation is being extended. Already, local buyers at Singapore have pronounced the quality of the product to be good, and not in any way inferior to Singapore gambier, whilst the price offered for it has been somewhat higher than the market price (*Kew Bulletin*, 78, 139).

**Spermolepis tannifera.** Heckel and Schlagdenhauffen, in a further paper on the exudation from the *Spermolepis gummifera* (see *ante*, p. 5), urge that the specific name of the plant should be changed so as to accord with the actual facts. When freed from woody matter and heated to 105°, the exuded product lost 13·598 per cent. of water. It was then treated successively with different solvents, ether dissolving 13·63 per cent. ; ether and alcohol, in equal proportion, a further 19·48 per cent. ; alcohol alone dissolved 66·42 per cent. of what remained ; and the residue from the alcohol (0·47 per cent.), after desiccation, was soluble in water. Chloroform and petroleum ether yielded negative results. After a detailed examination, the composition of the exudation was ascertained to be as follows :—Gallo-tannic acid, 79·73 per cent. ; tanno-resin, insoluble in boiling water, 19·5 ; gum, colouring and albuminoid matter, and fixed salts, 0·47 ; together with 0·3 of a crystalline substance requiring further investigation. This crystalline substance was also found in the wood of the tree, but not in the bark, and is said to resemble catechin, though not identical with it. Both wood and bark contain gallo-tannic acid, but the tanno-resin found in the exudation does not occur in either. It is proposed that the tree should be henceforth known as *Spermolepis tannifera* (*Répertoire*, [3], v., 289).

**Constituents of the Squill.** S. Waliszewski has conducted a research on the principles existing in the *Scilla maritima* (*Urginea Scilla*), and confirmed the results embodied by him in a thesis published in 1879, whilst ascertaining further details. Thus, he now claims to have proved the presence of four distinct bitter principles which may, to some extent, be differentiated by their varying effect on the tongue and lips. Referring to Merck's work at the same subject (see *Ph.J.*, [3], ix., 1038), he asserts that the bodies obtained by that investigator were not crystallised, but this is only correct of Merck's scillipicrin and scillitoxin, the scillin, described as being the least active substance, occurring as a crystalline powder. The "scilline" described by Riche and Rémont (see *Ph.J.*, [3], xi., 352) is claimed by Waliszewski to be a substance formerly classed by him as mucilage. The compounds now dealt with are said to be crystalline. Scillinine, the first, when prepared according to the methods described in the thesis already referred to, must be washed with water and, subsequently, chloroform to obtain it in a pure condition. The water removes a soluble principle which the author names scillapicrin, whilst the chloroform extracts a substance termed scillamarin. The fourth principle is very difficult to isolate, but is described as insoluble in alcohol and very soluble in water (*Union pharm.*, xxxiv., 251).

**Licareol and Licarhodol.** Licareol is the name given by Ph. Barbier to the alcohol ($C_{10}H_{18}O$) present in the oil of licari kanali (*Licaria guianensis*), the products of which have been the subject of a series of notes in the *Comptes rendus* (see vol. cxvi.). The oil has been described by Morin (*Ann. de Chim. et de Phys.*, [5], xxv., 427) as being distilled from the wood of the plant, and known in French commerce as oil of linaloes, though it is quite distinct from the Mexican product bearing that name. Its odour is said to recall that of both rose and citron. Licareol is lævorotatory, and yields licareal or licaric aldehyde, $C_{10}H_{16}O$, and licaric acid, $C_{10}H_{16}O_2$, by oxidation. Analysis of the barium salts of the volatile acid products of the oxidation of licareol and licareal demonstrates the absence of valerianic acid, the mixture obtained containing formic and acetic acids, with a trace of isobutyric acid. By the action of bromine, licareol forms a tetrabromide, $C_{10}H_{18}Br_4O$, when acted upon by dry gaseous hydrochloric acid, it is converted into a dichlorhydrate, $C_{10}H_{18}Cl_2$, whilst acetic anhydride causes its dehydration, an acetic ether being formed and an optically active limonene, $C_{10}H_{16}$, which Barbier terms licarene. On saponification of the acetic ether with alcoholic potash solution, a new alcohol, named licarhodol, $C_{10}H_{18}O$, is formed. This has a strong odour of roses, forms an aldehyde, $C_{10}H_{16}O$, having similar properties to that derived from licareol, and, also like the latter, is converted into a dichlorhydrate, $C_{10}H_{18}Cl_2$, by the action of dry hydrochloric acid gas. It is regarded, therefore, as a stable stereo-isomer of licareol. By the action of acetic anhydride licarhodol is converted entirely into its acetic ether, whereas, under identical conditions, licareol is only partly converted into the same acetic ether, licarene being at the same time formed as described above.

**Coriandrol.** Oil of coriander is stated by Ph. Barbier to yield a hydrocarbon of the formula $C_{10}H_{16}$, an alcohol named coriandrol, and an oxygenated body not yet described. Coriandrol, when treated with acetic anhydride, gives rise to a dextro-rotatory limonene, of which the physical and chemical properties are identical with those of licarene, together with an acetic ether of a stereo-isomeric alcohol corresponding to licarhodol and apparently identical with it. Barbier considers, therefore, that coriandrol is but a dextrorotatory modification of licareol. It is a colourless liquid, boiling between 92° and 93°, and differs from licareol in odour, but otherwise possesses similar properties. The aldehyde and an acid formed from it are both inactive and apparently identical with those derived from licareol, and all the evidence tends to prove that this alcohol exists in the two modifications, differing in the direction of their rotatory power but otherwise practically identical (*Comp. rend.*, cxvi., 1459).

**Oil of Spike.** G. Bouchardat, after making a re-examination of the oil of *Lavandula spica*, describes it as consisting for the greater part of linalool, which he regards as identical with the licareol of Barbier, laurel camphor, and eucalyptol. He also finds present small quantities of borneol, terpineol, geraniol, a terebenthene, and a copaivene, together with traces of other undetermined products (*Comp. rend.*, cxvii., 53).

**Geraniol.** Ph. Barbier has completed his researches on the open chain alcohols, of the formula $C_{10}H_{18}O$, by studying the geraniol extracted from the oil of *Andropogon Schœnanthus.* Referring to Semmler's investigation of the constitution of this alcohol he points out that the resulting formula seems to indicate the existence of a stereo-isomer having the same relation to geraniol as licareol to licarhodol. Acting upon geraniol with acetic anhydride, in a closed vessel at 150°, the only product was geraniol acetic ether, $C_{10}H_{17}O{\cdot}C_2H_3O$, a colourless liquid of agreeable odour, boiling at 129°-130°. Alcoholic potash saponified this ether, producing geraniol anew, but in a purified condition, being now perfectly colourless, and having a much finer and more fragrant odour than the primitive alcohol possessed. Treated with dry hydrochloric acid gas the geraniol gave a liquid dichlorhydrate, $C_{10}H_{18}O_2$, boiling at 142°-143°, and this, decomposed by means of a boiling acetic solution of potassium acetate, formed dipentene. Geraniol is therefore regarded by Barbier as presenting itself as the stable stereochemical modification, its passage through the acetic combination resulting in no isomeric change, but only in the purification of the compound. With regard to Bouchardat's claim to have transformed linalool into geraniol (see *ante*, p. 3), Barbier points out that if linalool is identical with licareol, as the former asserts, the product of the reaction described must be licarhodol (see preceding note) and not geraniol, these two alcohols being totally different both in their constitution and properties. Judging from Bouchardat's results, he is of opinion that the linalool of oil of spike is nothing but an unstable stereo-isomeric modification of geraniol, playing the same rôle with regard to that as licareol to licarhodol, and thus confirming and aiding in the generalisation of the facts previously submitted (*Comp. rend.*, cxvii., 120).

**Rhodinol.** This isomer of geraniol, according to Barbier, stands in a similar relation to licareol, but it yields valerianic acid by oxidation. The evidence regarding its constitution points, as in the case of licareol, to the existence of two stereo-isomers, one stable and the other the reverse, the unstable compound being transformable into the first after heating with acetic anhydride. Rhodinol submitted to this treatment formed only rhodinol-acetic ether, a colourless mobile liquid of agreeable odour, boiling at 131°. On saponification unaltered rhodinol was re-formed from this ether. The alcohol appears therefore to constitute the stable modification, corresponding to an, as yet, unknown unstable one capable of conversion into the former on treatment with acetic anhydride (*Comp. rend.*, cxvii., 177).

**Carbohydrates of the Artichoke.** Ch. Tanret finds that artichoke tubers, examined just before they are fully developed, contain about one hundred and sixty grammes of the following carbohydrates per litre of juice:—saccharose, inulin, pseudo-inulin, inulenin (see *Ph. J.*, [3], xxiii., 807), helianthenin, and synanthrin. Helianthenin is a crystalline body melting at 176°, lævo-rotatory, soluble in its own weight of cold water, and very soluble in weak alcohol. When dried at 110°, its composition may be represented thus:—$12(C_{12}H_{10}O_{10}),3H_2O_2$. It can be fermented by beer yeast, and it is found, together with synanthrin, in the dahlia and elecampane as well as in the artichoke. Synanthrin is amorphous, melts at 170°, is soluble in all proportions in water and weak alcohol, is lævo-rotatory, and can be fermented. When dried it accords with the formula:—$8(C_{12}H_{10}O_{10}),H_2O_2$. It possesses the singular property of hindering the formation of barium saccharate from cane sugar. The characteristic precipitate is only formed when the proportion of the sugar exceeds that of the synanthrin in the proportion of 1·5 to 1. Tanret considers that it is such a mixture as this which has been extracted from the artichoke and named lævulin or synanthrose under the impression that it was a distinct inactive sugar. Only when maturity is attained do lævulose and glucose appear in the artichoke tubers, and then only in small quantity, not exceeding four grammes per litre of the juice. All the carbohydrates are represented by formulæ of which the nucleus is $C_{12}H_{10}O_{10}$, combined with at least one molecule of water. Under the influence of dilute acids or even of water they are converted into a mixture of lævulose and glucose, and they are clearly distinguished from each other by their respective physical properties, such as rotatory power and solubility. By treatment with alcohol of varying strengths and at different temperatures, it is possible to separate the various substances, and a method of analysis is thus afforded by means of which the formation and transformations of inulin in plants may be studied (*Comp. rend.*, cxvii., 50).

**Ferment in Penicillium.** E. Gérard has found in the *Penicillium glaucum* a ferment acting similarly to emulsin. The mould was macerated in distilled water, the resulting solution concentrated in a vacuum, and precipitation effected by the addition of absolute alcohol. The precipitate consisted of an impure mixture of ferments and, after purification, was found to be capable of splitting up amygdalin into glucose, essential oil of bitter almonds, and hydrocyanic acid. A similar result occurred in the case of salicin, which was converted into glucose and saligenin. It would seem probable therefore that the special ferment effecting these results may be shown to be identical with emulsin (*Journ. de Pharm.*, [5], xxviii., 11).

**Structure of Yeast.** P. A. Dangeard claims to have proved that the *Saccharomyces cerevisiæ* possesses a well-characterised nucleus. His material was fixed with absolute alcohol and stained with hæmatoxylin, and the details were rendered evident by the aid of a Zeiss apochromatic objective of 2 m.m. focus. The yeast cell, under these conditions, is said to show, under the limiting membrane, a thick bed of dense homogeneous protoplasm coloured by the reagent. This protoplasm encloses a large vacuole, and the nucleus is found lodged in the thickness of the protoplasmic bed, being described as spherical, limited by a very clear nuclear membrane, and containing in the centre a large nucleolus strongly coloured. The mass of hyaloplasm between the nucleolus and the membrane is said to remain free from colour, and one or more threads of chromatin may frequently be seen in immediate contact with the nuclear membrane. When the operation of budding takes place the bud about to separate and form a new cell makes its appearance at a spot diametrically opposite to that where the nucleus is situated. It is almost spherical and, like the mother cell, contains a mass of protoplasm enclosing a vacuole. It is attached to the mother cell by a very fine pedicel, which subsequently disappears. Up to this stage the nucleus shows no change, but now it moves towards the point of attachment of the pedicel and splits into two parts, each of which consists of half the nucleolus, surrounded by a clear hyaloplasmic zone. One of these new nuclei then becomes united to the pedicel as at the mouth of a funnel, and a slender thread of chromatin presently extends from the point of union to the daughter cell. There it becomes swollen, and gradually attracts to itself all the chromatic granules. During the passage through the pedicel the nucleus shows no trace of nuclear membrane but, subsequently, this appears as usual. The nucleus remaining in the mother cell is carried to another point where a fresh bud has formed. When growth is rapid several buds may be observed in a cell at the same time, but they are of different ages, having been formed successively in the manner described, each new budding corresponding to a fresh division of the nucleus (*Comp. rend.*, cxvii., 68).

**Vegetation in Hydrogen.** Dr. T. L. Phipson has found that certain plants (*Poa*, *Myosotis*, *Antirrhinum*, and *Convolvulus*) can exist for many weeks in an atmosphere of pure carbon dioxide but do not thrive, cell-formation becoming slower and slower. At the same time, in an atmosphere that would prove fatal to an animal in a few minutes, they live and appear healthy. Plants of *Convolvulus arvensis* and *Antirrhinum majus* were next placed in an atmosphere of pure hydrogen, in an apparatus so arranged that water could enter to compensate for any diminution that might occur in the volume of gas. For the first few days nothing peculiar was noticed, but soon the volume of gas began to diminish and, in the course of a month, eighty per cent. of the atmosphere in which the *Convolvulus* vegetated was absorbed whilst the residue was not hydrogen. A similar result occurred with the *Antirrhinum*, but the process was slower. In both cases the leaves were slightly bleached but, as water charged with carbon dioxide rose in the vessels, the green colour reappeared. Cell formation was very rapid in the *Convolvulus*, and the plants remained perfectly healthy. Dr. Phipson attributes the disappearance of the hydrogen to combination with oxygen given off by the leaves (*Chem. News*, lxvii., 303).

**Diffusion of Potassium Iodide.** Dr. H. L. Roberts finds that, when used as a basis for ointment of potassium iodide, lard offers less hindrance to the diffusion of the salt through sheep's bladder into water at the ordinary temperature than wool-fat or soft paraffin, the last-named being most obstructive. Thus, in thirty-six hours an abundant trace of iodine could be detected in the water when lard was used, a distinct one in the case of wool-fat, and but a slight trace with the paraffin. When, however, parchment paper was substituted for sheep's bladder the first two seemed to act alike, a slight trace only of iodine being detected after thirty-nine and a half hours in each case, whilst the result was nil with the third medium. These results appear to indicate that very slight changes of treatment may induce notable variations in the absorption of drugs from ointments through dead membranes, and Dr. Roberts hints that the influence of changes of conditions in the living tissues of the skin may be of still greater importance (*Brit. Journ. Dermatology*, v., 218).

**Mercurial Salicylates.** H. Lajoux and A. Grandval describe their later researches upon these compounds, which they were the first to prepare some years ago, when they obtained both normal and basic mercuric and mercurous salicylates. Normal mercuric salicylate they prepare by precipitating a solution of a mercuric salt with normal sodium salicylate, in the cold. It then occurs as a white powder, insoluble in water and decomposed by heat. When boiled with water it is entirely decomposed into salicylic acid and the basic salicylate. The latter compound is prepared directly from salicylic acid by suspending this in boiling water and adding recently precipitated and well washed oxide of mercury little by little, until the correct proportion has been used, care being taken that no fresh portion is added until the last is properly combined, that fact being indicated by the disappearance of the yellow tint of the mixture. The resulting white powder may be freed from any excess of acid by washing. It is insoluble in water, alcohol, ether, and chloroform, and is decomposed by heat (*Comp. rend.*, cxvii., 44).

**Melissic Alcohol.** A. Gascard has definitely established the identity of the alcohols yielded by beeswax, carnauba wax, and gum lac, by repeatedly purifying them until products of identical melting point were obtained. In the cases of gum lac and carnauba wax he found the melting point of the alcohols to be 88°, but that from beeswax melted at 85°, that number according with the one previously published by Brodie. After repeated crystallisations, however, this was gradually raised to 87°. Etherification of the alcohol was next effected, the ether purified and then saponified. The resulting alcohol, after being twice recrystallised from benzine, was found to have a melting point of 88°, thus according with the figure obtained in the other cases (*Journ. de Pharm.*, [5], xxviii., 49).

**Chromopyrosulphuric Acid.** A. Recoura has prepared this compound by evaporating on a water-bath a solution containing chromium sulphate and sulphuric acid, in the molecular proportions of one to five. A dark green syrupy liquid was thus obtained which, after being maintained for a day or two at a temperature of 110°-115°, solidified in the form of transparent, brittle, vitreous lamellæ. On analysis the new compound was found to contain eight molecules of $SO_3$ to one of $Cr_2O_3$. It is very soluble in water, and its solution precipitates all metallic salts from solution even those of potassium, sodium, and ammonium. The general result in such cases is said to be that the flocculent, greenish precipitate contains chromium, sulphuric acid, and the metal of which the salt was in solution, whilst four molecules of sulphuric acid remain in the filtrate (*Comp. rend.*, cxvii., 37).

**Asaprol.** Dujardin-Beaumetz and Stackler have given this name to a soluble derivative of $\beta$-naphthol. It is the sulphonic ether of $\beta$-naphthol in the condition of a calcium salt, and contains traces of naphthol and calcium sulphate. A whitish powder, extremely soluble in water and alcohol, in antiseptic power it approaches sodium salicylate, which it also resembles in its therapeutic effects, being particularly active in acute articular rheumatism. It is administered in similar doses to the salicylate, and is tolerated by the organism to a remarkable extent, being taken without inconvenience when the sodium salt cannot so be used (*Comp. rend.*, cxvi., 1477).

**Bromoborates of Iron and Zinc.** G. Rousseau and H. Allaire have recently shown (*Comp. rend.*, cxvi., 1445) that it is possible to replace the magnesium in boracite by iron, zinc, or other metal. The chloroborate of iron was thus prepared, and was described as crystallising in transparent cubes of a greyish colour. The composition of these was as follows:—$(6FeO, 8B_2O_3, FeCl_2)$. They dissolved slowly in nitric acid, and were rapidly decomposed when fused with alkaline carbonates. It was further shown that the chlorine of the boracite could be replaced by bromine, iodine, or fluorine. The authors now describe the bromoborates of iron and zinc which they have prepared. The former was obtained as a greyish powdery mass of cubes and tetrahedrons, which dissolved slowly in warm nitric acid. The composition of the crystals corresponds to $6FeO, 8B_2O_3, FeBr_2$, but they also contain a small proportion of calcium oxide which seems to replace an equivalent quantity of iron oxide. The bromoborate of zinc, $6ZnO, 8B_2O_3, ZnBr_2$, was obtained in microscopic white crystals (*Comp. rend.*, cxvi., 1446).

**Decalcified Milk.** Dr. A. E. Wright suggests that since infantile dyspepsia is probably due to the formation of rennet curds, it might be well to delay the rennet coagulation by previously precipitating the lime salts of milk by a process based on that indicated by Arthus and Pagès. These observers found that rennet coagulation was delayed and the curds were less firm as an increasing proportion of the lime salts of the milk was precipitated in an insoluble form. On the other hand, they showed that the addition of soluble lime salts to milk caused increased rapidity of rennet coagulation accompanied by increased firmness of clot. The precipitants they used were fluorides and oxalates, salts which of course cannot be employed in dietetics. Dr. Wright proposes to use in place of them sodium citrate. He finds that an addition of one part of this salt to two hundred parts of milk suffices to prevent any rennet coagulation, and can hardly be detected by the palate. The addition of a smaller proportion than this to cow's milk would, it is suggested, convert it, with regard to its lime salts, into a true "humanised milk," and in cases where acid curds also contribute to dyspeptic troubles the use of the customary sodium bicarbonate or lime water would apparently be indicated. Bunge has pointed out that lime water contains less lime than cow's milk, so that its addition actually reduces the proportion of lime in a given quantity of fluid. By virtue of its alkalinity, too, lime water probably aids the digestion of cow's milk by postponing rennet coagulation (*Lancet*, 3647, 194).

**Copper Fluorides.** M. Poulenc has succeeded in obtaining cuprous fluoride, $Cu_2F_2$, by acting upon cuprous chloride with gaseous hydrofluoric acid. The anhydrous compound forms a transparent ruby-coloured mass, having a crystalline fracture. It is insoluble in alcohol at 90°, but boiling hydrochloric acid dissolves it, as does also nitric acid, whilst sulphuric acid, even when warmed, has but little effect upon it. Cupric fluoride, $CuF_2$, is readily prepared from the former compound, being formed when the anhydrous cuprous fluoride is simply exposed to the air or, more rapidly, when placed in contact with water. It is described as a white crystalline powder which assumes a slight greenish-blue tint on exposure to air. It dissolves readily in hydrochloric, nitric, and hydrofluoric acids, and is reduced with great facility by hydrogen. The vapour of water decomposes it, at a low temperature, into oxide of copper and hydrofluoric acid, and alkaline carbonates transform it into a similar oxide together with the formation of an alkaline fluoride (*Comp. rend.*, cxvi., 1446).

**Manufacture of Ozone.** The preparation of ozone on a commercial scale is reported to have been successfully accomplished. Andreoli, by adopting a special form of apparatus, in which many of the delicate bearings of Simens and Brodie's ozone generator are dispensed with, is said to have converted oxygen into ozone to the extent of six per cent. The oxygen or air is passed between points from which electricity under high tension "flows," and part of the oxygen is thus condensed into ozone. Shenstone and Priest, working with a generator of the Brodie pattern, are understood to have obtained as much as thirty per cent. of ozone (see *ante*, p. 55). When formed, however, the gas is very difficult to preserve, on account of its tendency to become reconverted into ordinary oxygen, and also because of its extraordinary diffusive power. The experiments on its commercial production have been carried out at Messrs. Allen and Hanbury's Bethnal Green works, but full particulars have not yet been published (*Lancet*, 3647, 210).

**Filtration of Liquids.** R. Lezé shows that the phenomena attending the filtration of liquids or their circulation in capillary tubes may be readily studied by application of the centrifugal force. On submitting a porous vessel containing the liquid to be studied to rapid rotation, after placing in it a gauge, it is said to be possible to determine the rate of filtration through the porous wall. Comparative experiments were made with two similar porous vessels, in which distilled water and the liquid to be compared were alternately placed. They were weighed before and after rotation to ascertain the amounts of liquid that had filtered through, and, subsequently, the experiment was repeated, with the liquids in the vessels reversed, so that confirmatory results were thus obtained. The rate at which water passed through the porous medium being taken as unity, the passage of sodium chloride solution (5 per cent.) was indicated by 1·023; potassium chloride, 1·043; sodium nitrate, 1·051; ammonium sulphate, 0·993; alcohol, from 0·59 to 0·67, according to strength; and milk, 0·03. In these experiments a pressure of eight to ten atmospheres was maintained for ten minutes (*Comp. rend.*, cxvi., 1440).

**Peptonisation in the Stomach.** Mathieu and Hallopeau conclude that the maximum richness of the gastric juice in peptone coincides with the maximum richness of chlorine in nitrogenous combination and of total chlorine. The combined chlorine is at least momentarily in combination with the peptone as well as the other albuminoid substances, when the figures are at their highest. It is not, however, in constant proportion with the quantity of dissolved albuminoid substances contained in the stomach at the moment when digestion is at its maximum, and cannot, therefore, serve to determine the amount of chloro-peptonisation performed by the stomach (*Arch. de méd. exper.*, No. 3, 1893).

**Bacteria and Calculi.** Dr. Gallipe points out that in 1886 he suggested that certain microbes found in calculous deposits and concretions formed within the human body were not accidentally present. They preserved their vitality for several years and could be isolated and cultivated. At a later period he instituted a series of experiments and found that in normal saliva saturated with carbonic acid a considerable number of small concretions of variable density were formed in the course of years. He has now been able to satisfy himself that these resulted from the precipitation of salts, consequent on decomposition set up by micro-organisms found within the concretions. These micro-organisms varied according to the kind of calculus in which they were found and could easily be cultivated, whilst the calculi consisted of the phosphates and carbonates of calcium and magnesium, being constituted similarly to those originating in the body in the usual way (*Comp. rend.*, cxvi., 1085). The *British Medical Journal* remarks that these researches are of undoubted interest, but notes that they have been in a measure anticipated by Mr. H. Robinson, Assistant to the Professor of Chemistry at Cambridge, who was able in 1889 to produce crops of crystalline concretions of ammonium-magnesium phosphate by cultivating certain specific bacteria found in well water. He showed, too, that saliva contained magnesium and calcium phosphates in solution, and that by the action of micro-organisms ammonia might be produced which would cause the formation of the triple phosphate whilst also precipitating the calcium phosphate. The precipitated salts are both constituents of the tartar deposited on teeth, and in test-tube experiments a substance resembling tartar was produced by the action of micro-organisms commonly found in the mouth. It thus appears probable therefore that these micro-organisms are the cause of the deposition of tartar on the teeth, and the results of Dr. Gallipe, recorded above, are on practically identical lines, though wider in their scope.

**Detection of Cholera Bacilli.** Koch's former method of examination, though certain in its results, was somewhat tedious, and a more speedy method has been tried at the Institute for Infectious Diseases, Berlin. A little mucus from the liquid part of the object to be examined is fixed on a cover glass and stained with diluted Ziehl's fuchsine solution. Cholera bacteria, in such a preparation, would either occur alone or mixed with the ordinary intestinal bacteria, especially *B. coli.* They are said to lie as a rule where the mucus is drawn into threads, and in the characteristically formed groups the individual bacilli lie in one direction. But even when the bacteria are scattered, and perhaps mixed with the *B. coli*, it is stated that Asiatic cholera may be diagnosed with certainty. Only when the specimen is a very mixed one is there any uncertainty in the matter. As regards the method of culture adopted, a peptone culture process is now employed by Koch in which the lumps of mucus are placed in a one per cent. sterilised peptone solution in a reagent glass, and kept at a temperature of 37° C. When the preparation begins to grow turbid, the bacteria may be discovered on the surface (in about six hours) if they are numerous in the test specimen, but when only few they are discovered later mixed with other bacteria. These peptone cultivations are said to have given positive results when gelatin plates failed, but the most satisfactory method of procedure is to combine the two processes (*Zeit. f. Hygiene*, through *Med. Press*, cvi., 643).

**Sterilised Dressings.** The practice of sterilising bandages and other dressings by simply exposing them to a temperature of 100° C. before use appears to be extending, and Hochenegg, of Vienna, points out that the many accidents that may occur render it difficult to decide if all the material on the operating tray has been thoroughly disinfected. To avoid this uncertainty, he has lately had the material he employs moistened on one side with a fluid that causes it to assume a fixed colour when exposed to the proper degree of heat. The colouring medium must be innocuous, and as it remains fixed other special precautions must be taken if it be desired to wash the material and use it a second time. The preparation employed has the following composition :—alum acet. solution (*Pharm. Austria*)), 150 parts; water, 150 parts; alizarin paste (20 per cent.), 5 parts. When applied it imparts to the dressings a slight brown colour which changes to bright red in the sterilising oven (*Med. Press.*, cvi., 643).

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## THE NOMENCLATURE AND FORMULÆ OF CARBON COMPOUNDS.

Up to the time when the first issue of the British Pharmacopœia was published the articles comprised in the materia medica consisted for the greater part of natural drugs derived from plants or animals, some mineral salts and acids, together with a few acids of vegetable origin and a very small number of the substances now classed as carbon compounds. When the British Pharmacopœia was issued in 1864 several of the active principles of drugs, which are substances belonging to the last-named class, had already been introduced into use as medicinal agents, and a considerable number of them were added to the official materia medica. But it is especially within the last few years that the number of such substances employed in medicine has been very largely extended. There has been an addition, not only of various active principles of old and new drugs, but also of a number of synthetically prepared carbon compounds which are, at the present time, of great importance in medical and pharmaceutical practice. It consequently follows that the pharmacist now requires to possess a much more intimate acquaintance with the chemical nature and constitution of such substances than was sufficient for the purposes of his business a few years ago. One of the difficulties to be overcome in acquiring a thorough knowledge of the chemistry of carbon compounds arises from the application to them of the complex and, at first sight, apparently artificial names, which are intended to denote their chemical nature and relations. These are particulars with which the pharmacist requires to be acquainted at the present day, and for the benefit of the younger readers of the Journal we therefore propose to give some general explanation of the principles upon which formulæ and names are made use of to indicate the constitution and chemical relations of carbon compounds.

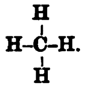
The object of chemical formulæ is to represent not only the percentage elementary composition of the bodies they represent, but also the views entertained by chemists as to the constitution of their molecules and the internal arrangement of the atoms.

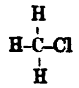
Formulæ which represent only the composition of carbon compounds and the relative proportions of their elementary constituents are insufficient for the purpose of indicating the nature of the bodies they represent or their chemical relations. Thus, for instance, the composition of the hydrocarbon known as olefiant gas is represented by the empirical formula $CH_2$; but there are many other hydrocarbons which consist of carbon and hydrogen in exactly the same proportions, though they are chemically and physically different from olefiant gas. In order to represent these bodies by formulæ it is necessary to take into account other facts besides elementary composition—such as vapour density, etc. The formulæ which are in that way assigned to these bodies—constituting the class of olefines—are found to be multiples of the general formula $C_nH_{2n}$, ranging up to $C_{30}H_{60}$. Even these formulæ fall short of indicating the structure or constitution of the bodies they represent, or the mode in which the atoms of carbon and hydrogen are united in the molecule of any one of the bodies belonging to this series. For that purpose it is necessary to take into account the chemical combining power or valency of the constituent atoms of these bodies as well as the chemical reactions of which the several bodies are capable. Upon that basis rational formulæ for carbon compounds are constructed which serve to represent not only their composition, but also their molecular weights and mutual relations, besides being a means of indicating the probable internal arrangement of the constituent atoms of which the molecules of a substance are made up.

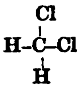
As the chemical knowledge of carbon compounds has advanced, it has become possible to assign to many substances names which indicate their constitution and molecular structure in the same manner as rational formulæ. To do this, it is necessary to use complex terms, the comprehension of which involves a knowledge of the general methods of the nomenclature. For instance, the statement that tropine is α-hydroxy-ethyl-methyl-tetrahydro-pyridine may appear barbarous to the uninstructed, and seem to convey even less information than the name tropine. It is therefore desirable to give some explanation of the utility of such names and of the methods on which they are constructed.

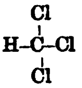
From the point of view of composition, the hydrocarbons, or substances consisting of carbon and hydrogen alone, are among the most simple carbon compounds; and nearly all other organic compounds may be regarded as derivatives of these.

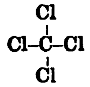
The composition of the hydrocarbon known as marsh gas is represented by the formula $CH_4$, which shows that the molecule consists of a quadrivalent[*] carbon atom, united with four atoms of hydrogen, and the arrangement of the atoms may be graphically represented by the extended formula shown here. A tetrad carbon atom united thus with four univalent atoms of hydrogen has its power of combination fully exercised, and is therefore said to be saturated, and this compound—the chemical name of which is methane—is called a saturated hydrocarbon. Other elements may be combined with the carbon atom in a similar manner, and occupy the place of one or more of the hydrogen atoms of methane, as shown by the following formulæ:—


$$\begin{array}{c}H\\|\\H-C-H.\\|\\H\end{array}$$
Methane.

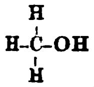

$$\begin{array}{c}H\\|\\H-C-Cl\\|\\H\end{array}$$
Monochlor-methane.

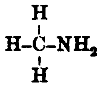

$$\begin{array}{c}Cl\\|\\H-C-Cl\\|\\H\end{array}$$
Dichlor-methane.

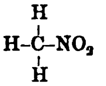

$$\begin{array}{c}Cl\\|\\H-C-Cl\\|\\Cl\end{array}$$
Trichlor-methane.


$$\begin{array}{c}Cl\\|\\Cl-C-Cl\\|\\Cl\end{array}$$
Tetrachlor-methane.

In like manner the place of a hydrogen atom may also be taken by a group of atoms possessing univalent combining power, such as hydroxyl HO, amidogen $NH_2$, or the nitro group $NO_2$, as shown by the following formulæ.

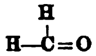

$$\begin{array}{c}H\\|\\H-C-OH\\|\\H\end{array}$$
Methyl alcohol.


$$\begin{array}{c}H\\|\\H-C-NH_2\\|\\H\end{array}$$
Methylamine.


$$\begin{array}{c}H\\|\\H-C-NO_2\\|\\H\end{array}$$
Nitromethane.

Such compounds can be derived from methane by substituting some other element or univalent group for one or more atoms of the hydrogen it contains, and their relation to methane may be expressed by corresponding names; thus methyl alcohol is hydroxy-methane, and methylamine is amido-methane.

It is not necessary that the element or group which replaces the hydrogen should be univalent like the latter; but according to its valency two or more hydrogen atoms may be replaced, as shown by the following formulæ:—

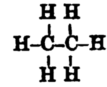

$$\begin{array}{c}H\\|\\H-C=O\end{array}$$
Formic aldehyde.

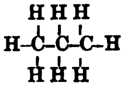
$O=C=O$
Carbonic anhydride.

$N\equiv CH$
Hydrocyanic acid.

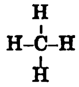
$S=C=S$
Carbon bisulphide.

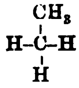
If the replacing element has greater combining power than the hydrogen which it replaces, the remainder of its "affinity" will be available for combination with some other atom or atoms. Thus if one of the hydrogen atoms in methane be replaced by an atom of carbon, the remaining combining power of this carbon atom, equivalent to three atoms of hydrogen (commonly spoken of as three bonds), can be exerted towards hydrogen or some other element. If these three bonds are thus "saturated" with hydrogen, the molecule of the resulting compound will be represented by the annexed graphic formula, which is that of the body known as ethane, $C_2H_6$. If one of the hydrogen atoms of ethane be replaced by a carbon atom and its three remaining bonds are saturated with hydrogen, the formula becomes that of propane, $C_3H_8$. By repeating this process, and replacing one hydrogen atom by a carbon atom attached to three atoms of hydrogen—or in other words, by the univalent methyl group $CH_3$—a series of formulæ will be obtained, each differing from the preceding member of the series by showing an additional $CH_2$ in the molecule. Bodies corresponding to these formulæ actually exist and constitute the "paraffin series of hydrocarbons.'

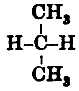

$$\begin{array}{ccccc}&H&&H&\\&|&&|&\\H-&C&-&C&-H,\\&|&&|&\\&H&&H&\end{array}$$
Ethane.

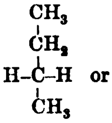

$$\begin{array}{ccccccc}&H&&H&&H&\\&|&&|&&|&\\H-&C&-&C&-&C&-H,\\&|&&|&&|&\\&H&&H&&H&\end{array}$$
Propane.

Paraffin Series.

Methane $CH_4$ =

$$\begin{array}{c}H\\|\\H-C-H\\|\\H\end{array}$$

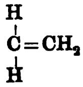
Ethane $C_2H_6$ =
Methyl-methane or dimethyl.

$$\begin{array}{c}CH_3\\|\\H-C-H\\|\\H\end{array}$$
or $CH_3-CH_3$

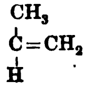
Propane $C_3H_8$ =
Dimethyl-methane.

$$\begin{array}{c}CH_3\\|\\H-C-H\\|\\CH_3\end{array}$$
or $CH_3-CH_2-CH_3$

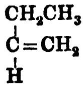
Butane $C_4H_{10}$ =

$$\begin{array}{c}CH_3\\|\\CH_2\\|\\H-C-H\\|\\CH_3\end{array}$$
or $CH_3-CH_2-CH_2-CH_3$

Any such series, the consecutive members of which differ by a regular addition of $CH_2$, is called a homologous series; the members of it being homologues of each other. If two atoms of hydrogen in methane be replaced by one of carbon, the remaining two bonds of the latter being again saturated with hydrogen, the formula $\substack{H\\H}>C=C<\substack{H\\H}$ will be obtained, which is that of ethylene, and by further substituting the $CH_3$ group for H, as was done with methane, formulæ are obtained representing the bodies known as the olefines. The formulæ of the first members of the olefine series will be—

Olefine Series.

Ethylene $C_2H_4$ =

$$\begin{array}{c}H\\|\\C=CH_2\\|\\H\end{array}$$
or $CH_2=CH_2$

Propylene $C_3H_6$ =

$$\begin{array}{c}CH_3\\|\\C=CH_2\\|\\H\end{array}$$
or $CH_3-CH=CH_2$

Butylene $C_4H_8$ =

$$\begin{array}{c}CH_2CH_3\\|\\C=CH_2\\|\\H\end{array}$$
or $CH_3-CH_2-CH=CH_2$

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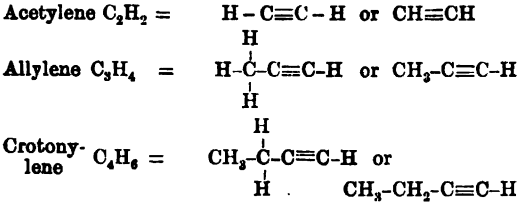
[*] The term tetravalent is also used.

By replacing three atoms of hydrogen in methane by one of carbon, the one remaining bond being saturated with hydrogen, the formula $H-C{\equiv}C-H$ is obtained, which is that of acetylene, $C_2H_2$; and the formulæ of the lower members of the acetylene series will be

Acetylene Series.

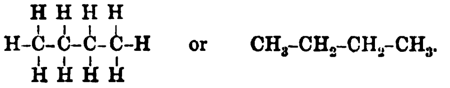


$$\begin{array}{lll} \text{Acetylene } C_2H_2 = & H-C{\equiv}C-H & \text{or } CH{\equiv}CH \\ \text{Allylene } C_3H_4 = & H-\overset{H}{\underset{H}{C}}-C{\equiv}C-H & \text{or } CH_3-C{\equiv}C-H \\ \text{Crotonylene } C_4H_6 = & CH_3-\overset{H}{\underset{H}{C}}-C{\equiv}C-H & \text{or } CH_3-CH_2-C{\equiv}C-H \end{array}$$

The relation between the carbon atoms which is characteristic of ethylene, and is represented by a double line, is known as the "double bond" or "double linkage." Every compound of the olefine series contains one such double bond. The relation between the carbon atoms in acetylene is known as a triple "bond" or "linkage," and it occurs in all compounds of the series. The compounds of these three series—the paraffins, olefines and acetylenes—with their derivatives, are known as "open-chain" compounds, being represented by formulæ showing the carbon atoms united in a line and the end members having their surplus affinities saturated with hydrogen, as in the graphic formulæ of ethane and propane.

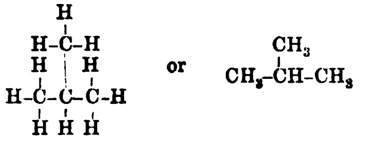
It will be seen from the graphic formulæ of the first three members of the paraffin series that the carbon atoms cannot be arranged in any other way than is there shown. In the case of the fourth, however, there are two isomeric substances which have the composition and molecular weight represented by the formulæ $C_4H_{10}$, and the difference between them is represented by their graphic formulæ as shown below.

Normal butane.



$$H-\overset{H}{\underset{H}{C}}-\overset{H}{\underset{H}{C}}-\overset{H}{\underset{H}{C}}-\overset{H}{\underset{H}{C}}-H \quad \text{or} \quad CH_3-CH_2-CH_2-CH_3.$$

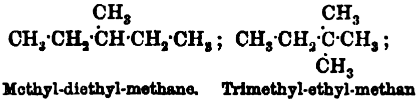
Secondary or isobutane.



$$\begin{array}{c} H \\ H-\overset{|}{C}-H \\ H \quad | \quad H \\ H-\overset{|}{C}-\overset{|}{C}-\overset{|}{C}-H \\ H \quad H \quad H \end{array} \quad \text{or} \quad CH_3-\overset{CH_3}{CH}-CH_3$$

The meaning of the term normal is that no carbon atom is attached to more than two others; while in the formula of isobutane one carbon atom is represented as attached to three others.

There are other compounds of this series in which one carbon atom is attached to three or four others, as in the following instances of isomeric forms of hexane, $C_6H_{14}$ (the bonds in these formulæ being indicated by dots, instead of lines, as above):

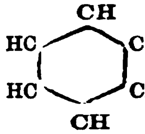


$$CH_3\cdot CH_2\cdot \overset{CH_3}{CH}\cdot CH_2\cdot CH_3; \quad CH_3\cdot CH_2\cdot \overset{CH_3}{\underset{CH_3}{C}}\cdot CH_3;$$

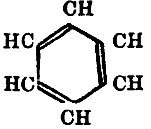
Methyl-diethyl-methane. Trimethyl-ethyl-methane.

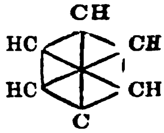
here the subsidiary portion of the molecule (the $CH_3$ group) is termed a "side chain," but the substance is still an open chain compound.

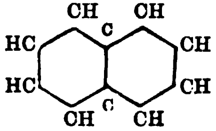
In contrast with these are the bodies whose composition is represented by formulæ in which the carbon atoms are arranged so as to form a "closed chain" or "ring," of which benzene is the simplest type. In its graphic formula it will be seen that each carbon atom is represented as being in combination with two others, so as to form a ring. This formula represents each carbon atom as exerting trivalent affinity; an objection that may be overcome by using one or other of the following formulæ—but that first given is preferable. In the same way as paraffins are derived from methane, a series of hydrocarbons are derived from benzene, by the substitution of the $CH_3$ group for hydrogen. From naphthalene, which is graphically represented as shown here, a similar series may be obtained.



Benzene.







Naphthalene.

It will be noticed that the names of all of the hydrocarbons end in -ne, while the vowel of the last syllable varies, but remains constant throughout any one series; as, methane, butane; benzene, toluene, etc. Whenever one hydrogen atom of a hydrocarbon is replaced by $CH_3$, the resulting body contains, in combination with that group, another group which was present in the original hydrocarbon attached to hydrogen; such groups enter and leave many compounds without undergoing any alteration in themselves, and though they cannot be obtained in the free state, it is convenient to have definite names for them. These names are arrived at by substituting for the last three letters of the name of the hydrocarbon the termination -yl, sometimes with slight changes in the stem of the word; as methyl, $CH_3$, from methane, $CH_4$; propyl, $C_3H_7$, from propane, $C_3H_8$; ethenyl, $C_2H_3$, from ethylene, $C_2H_4$; butenyl, $C_4H_7$, from butylene, $C_4H_8$; acetenyl, $C_2H$, from acetylene, $C_2H_2$, etc. In some cases, however, there is a deviation from this rule; thus the group $C_6H_5$, from benzene, $C_6H_6$, is called phenyl, the name being derived from phenöene, another name for benzene. In the case of toluene, which is the next higher homologue of benzene, and has the formula $C_6H_5$—$CH_3$, the hydrogen atoms do not all bear the same relation to the molecule as they do in benzene, five of them being attached to a closed chain, and three to an open side-chain. Hence by removing an atom of hydrogen in one or the other condition, it is possible to leave two different groupings, which will be represented by the formulæ $CH_3\cdot C_6H_4$, and $C_6H_5\cdot CH_2$. The former of these, where hydrogen is removed from the phenyl group, is called tolyl, and the latter, where hydrogen is removed from the methyl group, is called benzyl, from benzoëne, another name for toluene. Groupings which thus consist of a hydrocarbon minus hydrogen are collectively termed alkyl residues or radicals; they form many compounds, some of which are exactly analogous to those formed by metals. *(To be continued.)*

The Pharmaceutical Journal.
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JULY 29, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## PREPARATIONS OF POISONS.

To most readers of this Journal it will no doubt appear strange that there should be any difficulty in the interpretation of the term "preparation" as applied in connection with medicine or pharmacy. But the questions put by Judge TURNER to one of the witnesses in the case reported in last week's Journal evidently show that the meaning of the term "preparation" was not correctly grasped by his Honour in its pharmaceutical sense (see *ante*, p. 77). The difficulty appears to have arisen in regard to the addition of "preparations of morphine" to the second part of the poison schedule, in accordance with the resolution of the Council of the Pharmaceutical Society in December, 1869. It was not clear to the mind of the judge what necessity there was for the resolution. That was in consequence of his regarding opium as being to some extent an ingredient of morphine, instead of the reverse. The statement of one of the witnesses that "morphine is a preparation of opium" did not remove the difficulty; but rather augmented it, for since "preparations of opium or of poppies" were included in the original schedule of the Act, morphine would come within that category if it were strictly speaking a preparation of opium. The further statement that morphine cannot be got direct from poppies, but only from the intermediate product, opium, added to the misunderstanding, and, as the counsel for the defence remarked, "made confusion worse confounded."

This little episode serves to illustrate the difficulty of stating the facts of such a case in a manner that will admit of their being duly appreciated by persons not technically acquainted with the subject to which they relate. It is therefore important to point out that the difficulty in perceiving the necessity for the resolution to add "preparations of morphine" to the schedule arose entirely from the reversal of the actual relation existing between morphine and opium. Though the "preparations of opium" included in the original schedule of the Act necessarily contain morphine, and they would on that account be, in a sense, preparations of morphine as well as preparations of opium, there might have been a question whether the application of the latter term on that principle would have included preparations of morphine in making which opium had not been used. Hence the necessity of the resolution to add "preparations of morphine" to the schedule. By that means all preparations containing morphine were made poisons within the meaning of the Act, whether made with opium or with the morphine previously extracted from it.

In regard to the precise meaning to be attached to the term preparation, in a pharmaceutical sense, there need be no great difficulty. The British Pharmacopœia distinctly indicates the articles which are officially recognised as "preparations" of various drugs and medicinal agents, and the principle upon which that is done, within those limits, may be extended to articles which are not official. For that purpose the dictionary definitions of the term "preparation" afford sufficient authority. Thus, WEBSTER defines the word as signifying generally "that which is prepared, made, or compounded for a particular purpose," and "in pharmacy, any medicinal substance fitted for the use of a patient," while the preparation of medicines is defined as "the process of fitting any substance for use in the art of healing." Consequently non-official articles containing opium or morphine are to be regarded as preparations of opium or of morphine, just in the same manner that the Pharmacopœia includes under preparations of opium or of morphine all official articles containing any proportion of opium or of morphine.

This difficulty as to the signification of the term preparation has on several occasions perplexed the legal mind in regard to the Pharmacy Act, and its origin may be traced back to the prosecution instituted by the Treasury in 1890 (see *Pharm. Journ.*, [3], xx., 805). On that occasion the counsel for the prosecution, in opening the case, described acetate of morphine and the medicine containing it as being preparations of opium. That statement is not altogether incorrect, in fact, it is supported by the authority of the British Pharmacopœia; but it is sufficiently inconsistent with technical usage to have given rise to much misunderstanding. The precedent which had been so established was followed in subsequent cases, and this loose application of terms, without regard for their proper signification, has furnished opportunity for recourse to specious argument, as in the Piper case, that a preparation of a poison is something quite different from a mere mixture of the poison with other things. In that way a perfectly simple matter has been made to appear obscure, and there has been a consequent necessity for explanations which might otherwise have been avoided.

## NOTTINGHAM AND NEIGHBOURHOOD.

The town of Nottingham, the ancient Snotingaham, is picturesquely situated on the ascending slope of a huge rock rising above the river Trent. It is sheltered on the north by a chain of hills, and commands a finely-varied prospect towards the south. The surrounding country is pleasantly diversified in appearance, hill alternating with dale and meadow with woodland. Near Mansfield, some few miles away, a height of six hundred feet above the sea-level is attained, and close by that town are the yet extensive remains of Sherwood Forest, which, in 1609, included nearly ten thousand acres of woodland. On the other hand occur the valley of the Trent and the extensive vale of Belvoir, located in the three counties of Leicester, Lincoln, and Nottingham.

From whichever side the town is approached the castle always forms a prominent object in the view. This building crowns the summit of a precipitous rock, 133 feet high. Its history practically embodies that of the town itself, just as that of the town is inseparable from the records of national progress. Nottingham is supposed to have been originally a Celtic settlement and a great resort of the Druids. Afterwards, it probably became a Roman station, but first became of importance in the ninth century. Belonging to the ancient kingdom of Mercia under the Heptarchy, after the defeat of Alfred the Great, in 868, the town fell into the hands of the Danes and became one of their five boroughs.

An old fortress, erected during the seventh or eighth century, was rebuilt by Edward the Elder, who also erected the town wall and threw a bridge over the Trent (920–4). After the Conquest the castle was again rebuilt by order of William the Conqueror, who gave it into the custody of William de Peverel, his reputed natural son. In the reign of Henry II. it became one of the fortified palaces of the King, and his immediate successors, Richard Cœur-de-Lion and John, frequently occupied it. Parliaments were held at Nottingham in 1334, 1337, and 1357, and Edward III. held his court there, marching thence against David II. of Scotland, who was subsequently imprisoned in the castle. The Lord Mayor, Sheriffs, and Aldermen of the city of London were also forcibly detained there by Richard II. whilst he was engaged in the struggle to render his monarchy absolute. In 1461, Edward IV. assembled his troops at Nottingham, and it was subsequently the headquarters of Richard III. immediately prior to the fatal battle of Bosworth. Much later in the history of the kingdom, Charles I. raised his standard at this town, after finally deciding upon an open contest with Parliament.

Falling into the hands of the Roundheads, the castle was dismantled by order of Cromwell, in 1644. Thirty years later, the then Duke of Newcastle replaced it by a large mansion, and this, in turn, was practically destroyed by fire during the Reform riot in 1831. The old gateway now existing is one of the few remaining portions of the building erected by the Conqueror, but the greater part of the present castle is of very recent date. After the fire the place became the property of the Corporation, was once more rebuilt, and converted into a museum of science and art. At this museum and art gallery the President (Octavius Corder, Esq.) of the British Pharmaceutical Conference will hold his official reception on the evening of Monday, August 14. In addition to the exhibition of antiquities, lace, pictures, etc., there will be the further attractions of the well laid out castle grounds and the magnificent views from the front of the building. The old dungeons and "Mortimer's Hole" will appeal to the curious, the latter being the reputed hiding place where Roger Mortimer, Earl of March, was seized, at the same time as Isabella, widow of Edward II., in 1327. Similar caves, hollowed out of the sandstone rock, many of which are used as wine-cellars, etc., are to be found under several buildings in the older part of Nottingham.

The Exchange Hall, where the sessions of Conference are to be held, in the Borough Council Chamber, on Tuesday and Wednesday, August 15 and 16, is situated in the market place, which is said to be one of the finest in England. It covers a triangular area nearly six acres in extent, and its boundary line extends about three quarters of a mile. It is related that shortly after the Norman Conquest this market place was divided into two parts, for the use of the Normans and Saxons respectively, by a wall built across it. Other places of interest in the town are numerous. Thus, there is the University College, where the local courses of instruction in pharmacy and kindred subjects are conducted; the Arboretum or public park and gardens, extending over seventeen acres; the Church Cemetery with its curious caves; and the river Trent with its bridges and boating. The Guildhall, School of Art, Free Library, and other buildings are also worthy of attention.

The population of the town, which in 1881 amounted to 186,575, in 1891 had increased to 211,984. The people are largely engaged in industrial pursuits, the staple manufactures being cotton, silk, and merino hosiery, lace, and machine building. Richard Arkwright erected his first spinning frame here in 1760, and Hargreaves, driven from Bradford, brought his spinning jenny to Nottingham during the following year. Several other industries of lesser importance are also carried on. The charter of the town was granted by Henry II. to confirm privileges granted by Henry I., and the borough was constituted a county in itself during the reign of Henry VI.

Whilst Nottingham is at the same time extremely rich in historical associations and of special importance as an industrial centre, it is no less noted as the centre of a district crowded with places of interest, a few of the more important of which those attending the Conference meeting will be privileged to visit. Thus, on the Tuesday afternoon, there will be an excursion to Belvoir* Castle, the seat of the Duke of Rutland. This is a freestone building in the pseudo-Gothic style, and has a frontage of two hundred and fifty-two feet. It is described as standing on a spur of the Leicestershire wolds, and commanding a magnificent prospect over the vale of Belvoir. Three counties and one hundred and seventy-three towns, villages, and hamlets are said to be comprised within the range of view from Belvoir heights—a radius of twenty-six miles. Wollaton Hall, the residence of Lord Middleton, will be visited on the following day, the company driving by way of the Lenton Boulevard, past the foot of the Castle Rock, through the Lenton Lodge and a fine avenue of gigantic lime trees, extending for three-quarters of a mile across the park, to the Hall. This is a magnificent building, erected by Sir Francis Willoughby in the year of the Spanish Armada. It is not a "show-place," and the Conference visitors are exceptionally fortunate in being able to inspect it, by the kind permission of his Lordship.

On the final day Welbeck Abbey will be the chief attraction. Passing through the "Birklands," a beautiful wood of birches, and the long avenue known as the "Duke's Drive," after viewing some of the finest forest scenery and most famous old oaks in England, the home of the Duke of Portland will be reached. The chief marvels of Welbeck are the immense underground apartments—riding school, picture gallery, dining-room, etc.—with the miniature railway for the conveyance of food, and many other wonderful contrivances. In the park there is a beautiful lake with an automatic ferry-boat, and tunnels in various directions connect the Abbey with the outer world. The return journey to Mansfield will be by way of Thoresby and Clumber, the seats of Earl Manvers and the Duke of Newcastle respectively.

A short stay will be made at the village of Edwinstowe, named after Edwin, King of Northumbria, who was slain in battle and buried in the forest. This is undoubtedly the best centre from which to visit the forest and adjoining estates, and an opportunity will be afforded by this break in the journey for visiting the "Major Oak," which has a circumference of ninety feet at its base, and inside which seven people are said to have breakfasted together, whilst sixteen are known to have squeezed themselves into it on another occasion. Later, the celebrated "Parliament Oak," under which Edward I. is stated to have held a parliament in 1290, will be passed. This tree is supposed to be between a thousand and fifteen hundred years old, and is probably one of the oldest trees in the district. Sherwood Forest is invariably associated in the popular mind with more or less legendary tales of Robin Hood and his prowess, and reminiscences of the bold outlaw and his bride, the Maid Marian, of his lieutenant Little John, of Friar Tuck, and Alan-a-Dale the minstrel of the band, crowd upon visitors to the scenes of their now departed glory. Antiquarians and lovers of natural history new to the district cannot fail to be impressed with the extent of the treasures it affords, and, whilst regretting the limited time at their disposal, will doubtless register an intention to pay a longer visit at some future time.

Apart from the regular excursions, visitors having sufficient time at their disposal may profitably see Newstead Abbey, the whilom home of Lord Byron; Chatsworth House, the "Palace of the Peak" and the princely residence of the Duke of Devonshire; Hardwick Hall, erected by the famous "Bess of Hardwick"; Haddon Hall, with its reminiscences of Dorothy Vernon; and many other famous old-time places, to say nothing of the natural beauties of the district as exhibited in the valley of the Wye and elsewhere. Matlock, Buxton, and numerous other holiday resorts are not far distant, and it may be anticipated therefore that, whatever special advantages may be possessed by other places at which the Conference has met, no meeting is likely to be hereafter esteemed as possessing greater interest than this second meeting at Nottingham.

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* Pronounced *Beever*.

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## PHARMACEUTICAL MEETINGS AT CHICAGO.

A circular issued by Mr. Henry Biroth, the Local Secretary of the American Pharmaceutical Association, gives the programme which has been adopted for the series of meetings commencing on the 14th of next month. On that day the first general session of the American Pharmaceutical Association will be held at 3 p.m., and in the evening there will be a reception. On Tuesday the second general session will be held at 9 a.m., and upon that day and Thursday the several sections will meet. Wednesday and Friday are to be devoted to visiting the Exposition. The final session is to take place on Saturday at 9 a.m., and there will afterwards be an excursion on Lake Michigan. On Monday, August 20, there will be a meeting of the World's Congress of Pharmacists at 10 a.m., and in the evening there will be a reception of foreign guests. The meetings of the International Pharmaceutical Congress will take place on Tuesday, Wednesday, and Thursday, and on the evening of Wednesday there will be a banquet. The Illinois Pharmaceutical Association will hold its annual meeting on August 16 and 18, and Mr. Biroth mentions that its members will be pleased to exchange greetings with their brethren visiting Chicago and to assist in entertaining them.

## THE PRESERVATION OF CHLOROFORM.

In a recent number of the 'Ephemeris,' Dr. **Squibb** calls attention to the fact that so far back as 1857 he read a paper before the New York Academy of Medicine on the subject of chloroform, in which he pointed out the importance of an addition of alcohol to chloroform as the best means of preventing its decomposition. He also claims that the practice was originated by him some years previously, and he republishes the paper above mentioned as evidence of the position he had then taken in regard to the decomposition to which pure chloroform is liable. In that paper it is pointed out that as the result of Dr. **Squibb's** observations he had found the tendency to decomposition became very marked when the chloroform had a purity indicated by a density above 1·497, and that decomposition became inevitable when chloroform had a density above 1·498. On that ground he suggested that it would be useful and proper to add a small proportion of alcohol so that the specific gravity of chloroform might be reduced to 1·49 or at least to 1·494. The circumstance that chloroform does not keep well after having been shaken with sulphuric acid is also ascribed to the abstraction of alcohol which is thus effected. It is evident, therefore, that Dr. **Squibb** is entitled to the credit of originality in having correctly appreciated the influence exercised by alcohol in preventing the decomposition of chloroform. The observation of the same fact by Dr. **Schacht** and Dr. **Biltz** at a somewhat later date, and their explanation of it, recently referred to in this Journal (see vol. xxiii., 1005), may, however, be regarded as independent, for the publication of Dr. **Squibb's** paper on the subject in the *American Medical Monthly* for 1857 is not likely to have been, at that period, the means of making the information generally known.

## MEETING OF LOCAL SECRETARIES AT NOTTINGHAM.

We have received the draft of a notice addressed to such local secretaries of the Pharmaceutical Society and delegates of local pharmaceutical associations as may attend the Conference meeting at Nottingham next month. They are requested to meet in the committee room of the Exchange Hall on Wednesday, August 16, at 9 a.m. prompt, "to discuss means for promoting the greater unity of pharmacists and the better protection of their trade interests." The notice is signed by Mr. W. L. **Currie**, President of the Glasgow and West of Scotland Pharmaceutical Association; Mr. H. **Kemp**, Local Secretary for Manchester; Mr. C. **Thompson**, President of the Midland Pharmaceutical Association; and Mr. W. H. **Parker**, Local Secretary for Nottingham.

## THE GERMAN APOTHEKER VEREIN.

The twenty-second annual general meeting of this body will take place at Frankfort-on-the-Maine, under the presidency of Herr **Fröleck**, of Berlin, commencing on Tuesday, September 5, with the reception of guests, and in the evening a social gathering in the zoological garden. The business meetings are to be held on September 6 and 7, and on the Friday following there will be an excursion to Homburg, concluding with a dinner in the Curhouse at 7 o'clock in the evening.

## BRITISH PHARMACEUTICAL CONFERENCE.

We are requested by Mr. **Gill**, the assistant honorary local secretary of the British Pharmaceutical Conference, at Nottingham, to announce that application for tickets for the August meeting must be made not later than Wednesday next, August 2.

The General Manager of the Midland Railway has forwarded particulars of the arrangements made on that line in connection with the Conference meeting, but we regret to note that these are practically the same as those on the Great Northern Railway (see *ante*, p. 70), no concession being made where it is most needed, *i.e.*, in the case of members residing at a distance of more than fifty miles from Nottingham.

A useful pictorial and descriptive guide to Sherwood Forest and the "Dukeries," with which is included a guide to the town of Nottingham, is published at a nominal cost by Messrs. Ward, Lock and Bowden, Limited. The work contains a map of the district, and is very full of information concerning all places of interest in Nottinghamshire and the adjoining portion of Derbyshire, besides which railway routes and fares, lists of hotels in the various towns and their tariffs, postal arrangements, etc., etc., are dealt with concisely and in convenient order. Altogether the book will be found extremely useful by visitors to the district during the Conference meeting.

## THE MEDICAL CURRICULUM.

An editorial in the *Medical Magazine* for July is devoted to consideration of the best use that can be made of the extra time in the extended curriculum, and the writer's arguments support the idea, expressed in this Journal some months ago (see vol. xxiii., p. 507), that the modern practitioner is frequently unable to treat certain cases properly on account of deficient training. In olden times, it is pointed out, the medical man's apprentice was an unqualified assistant, and got an insight into the ways of practice by actual participation in the work. This, however, is no longer permissible, and it is suggested that the only way in which it will be possible to ascertain whether the extra year has been well or ill-spent, and impress students with the fact that they should devote themselves to work of a really useful and practical kind, is to have some general practitioners on the Boards of Examiners for the final qualifying examination. As matters now are, it is claimed that, while medicine forms ninety-nine parts out a hundred of every practice, surgery dominates medical education. Looking at the matter from the pharmacist's standpoint, it seems next to impossible that, under the existing condition of affairs, such a practical knowledge of the uses and effects of drugs can be attained as will enable the practitioner to excel as a prescriber, whilst the danger of his becoming a mere tool in the hands of makers of secret or insufficiently described preparations is exceedingly great.

## A CORRECTION.

We have much pleasure in directing attention to a letter from Dr. **Danford Thomas**, the coroner of the Paddington district, in which the erroneous statements in the *Echo*, to which we referred in last week's Journal, are ascribed by him to sub-editorial manipulation of the reports sent to that paper. Unfortunately, similar inaccurate reports have also appeared in several other papers besides the *Echo*, and have been made use of as a ground for misleading remarks as to the assumed inefficacy of the Pharmacy Act. It is therefore desirable that such misrepresentations should be corrected, and we are obliged to Dr. DANFORD THOMAS for his denial of the statements attributed to him.

### THE SOURCE OF CHOLERA.

IN the course of an address before the American Medical Association, Mr. ERNEST HART said that cholera was a filth disease, carried by dirty people to dirty places and spread by dirty or impure water. It came from India and India only, and was a man-created disease. Drugs were, comparatively speaking, powerless against it. The war against cholera was the war of cleanliness against filth, and the one kind of cleanliness which was absolutely essential, and in the face of which cholera could not spread or become epidemic, was purity of drinking water. Fumigation, quarantines, libations, and sprinklings with antiseptic fluids and powders were mere sacrifices to popular ignorance and prejudice. They created a false security and distracted attention from purification of soil, air, and water, the latter being above all the important agent of safety. When people united in insisting upon municipalities and corporations giving them pure water, cholera would become extinct and its terrors a mere recollection, for it had been shown that there never had been an outbreak of the disease in Europe that could not be traced to the distribution of an infected water supply.

### THE AUTHORITY OF THE PHARMACOPŒIA.

IN connection with the prosecution for the sale of soda water alleged to be deficient in strength (see page 98), a point presents itself for consideration that is not always fully obvious to those who are most intimately concerned regarding it. That is, how far does the authority of the Pharmacopœia extend? This question was raised by the counsel for the defence, but he was prevented from elaborating his point by the too friendly intentions of the magistrate. Reference to the preface to the British Pharmacopœia, 1867, which is reproduced in subsequent issues and must be regarded in a similar light to the preamble of an Act of Parliament, shows that it is ordained by Statute that the book shall contain "a list of medicines and compounds." Further, that the work "is intended to afford to members of the medical profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide," and again, that the Pharmacopœia has for its object "the definition of substances which the physician prescribes." Nothing is found concerning dietetic articles or, indeed, anything except drugs and their preparations, and only as regards these when intended for medicinal use. It is thus seen that the authority of the work is nothing like so far-reaching as is frequently claimed, and the idea suggests itself that much of the difficulty regarding official synonyms is in reality quite imaginary when considered from the point of view of what the British Pharmacopœia really is.

### BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

NOTTINGHAM will be this year a centre of attraction not only for pharmacists in consequence of the meeting of the British Pharmaceutical Conference in August, but it will also be the meeting place of the British Association in the following month. The customary annual members' invitation circular has now been issued by the General Secretaries, announcing that the meeting will commence on Wednesday, September 13, and giving information concerning the arrangements that have been made as to the meetings of the General Committee, the general meetings, evening meetings, and sections, etc. The President-elect for this year is Dr. BURDON SANDERSON, the Professor of Physiology in the University of Oxford. The secton of chemistry will be presided over by Professor EMERSON REYNOLDS. Accompanying the circular of the Association is another issued by the honorary local secretaries in Nottingham, conveying, on behalf of the Local Executive Committee, an invitation to attend the meeting, and pointing out the facility with which Nottingham may be reached from all parts of the kingdom, owing to its central position, as well as the attractions afforded by the industrial establishments and interesting character of the town and neighbourhood. The reception room will be in the Mechanics' Institution, and the various sections will hold their meetings in the University College, or in rooms in the immediate vicinity of the College.

### ROYAL GARDENS, KEW.

WE learn from the *Kew Bulletin* that Dr. COOKE, who has re-arranged and brought into excellent order the whole of the Kew collections of Fungi, has received, on his retirement, a small addition to his pension in consideration of his services in the herbarium of the Royal Gardens. Dr. COOKE's connection with Kew dates from 1880, and he was then regarded as the leading living authority in mycology in the country. The vacancy created by his retirement has been filled by the appointment of Mr. G. MASSEE as principal assistant (cryptogams), with a somewhat larger scope of duties. Mr. MASSEE is an acknowledged authority in cryptogamic botany, and he has published many works and papers connected with fungology. Through Mr. SCOTT ELLIOT, corms of the *Acidanthera æquinoctialis* have been received at the gardens for cultivation. This plant produces a perianth having a tube five or six inches long, being the longest known in the order *Irideæ*. The whole collection brought home by Mr. SCOTT ELLIOT, as botanist to the Anglo-French Delimitation Commission in Sierra Leone, contains fifteen hundred species. From Calcutta, Dr. G. KING has sent a collection of between two and three hundred new or rare Malayan plants, and a set of two hundred and seventy specimens of the late Father SCORTECHINI's Perak ferns. A further set of two hundred and twenty species of Malayan plants has also been forwarded by Mr. CHARLES CURTIS, Assistant Superintendent of the Forest Department, Penang. Other additions include specimens collected in the Western Himalayas, Central and Northern Persia, Kastamuni, Asia Minor, the Island of Yeso, Lagos, Mexico, New Guinea, and New Zealand.

# Transactions of the Pharmaceutical Society.

## EXAMINATIONS IN LONDON.

*July*, 1893.

Present:—Mr. Carteighe, President; Mr. Cross, Vice-President; Messrs. Blunt, Corder, Druce, Fletcher, Gerrard, Greenish, Holmes, Ransom, Saul, Symons, Tanner, and Taylor.

Dr. Stevenson was also present on behalf of the Privy Council.

### MAJOR EXAMINATION.

*Fifty-two* candidates were examined. *Twenty-seven* failed. The undermentioned *twenty-five* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

| | |
|---|---|
| Allenby, John Edward | Helmsley. |
| Anderson, William | Ashton-under-Lyne. |
| Barley, Alfred Henry | Broadstairs. |
| Booth, Samuel Verdon | Sheffield. |
| Buckle, John Dolphin | Scorton. |
| Calvert, John | Bradford. |
| Cleave, Reverdy | Pontefract. |
| Cooper, Albert John Bullen | London. |
| Corfe, Alfred Frederick | Maidstone. |
| Edwards, Robert Griffith | Bala. |
| Goulding, Ernest | Holloway. |
| Guy, Fredk. John Vavasour | Uppingham. |
| Jones, Geoffrey Stuart | Monmouth. |
| Marsden, Prosper Henry | Manchester. |
| Moore, William | Wisbech. |
| Muir, Thomas Holmes | Glasgow. |
| Nunn, Arthur William | Colchester. |
| Parker, Christian | Bath. |
| Parry, Frederick George | Stockton-on-Tees. |
| Rose, Francis | London. |
| Stelfox, John Arthur | Manchester. |
| Stephens, Frank Robert | Clevedon. |
| Tickle, Thomas | Exbourne. |
| Tilson, Annie Elizabeth | Long Sutton. |
| West, Joseph Arthur | Peckham. |

### MODIFIED EXAMINATION.

*Two* candidates were examined. *One* failed. The undermentioned passed, and was declared qualified to be registered as a Chemist and Druggist:—

| | |
|---|---|
| Bass, Charles Murfleet | Rugeley. |

### FIRST EXAMINATION.

The Report of the College of Preceptors on the Examination held on the 11th inst. was received.

*Three hundred and ninety-eight* candidates had presented themselves for examination, of whom *one hundred and ninety* had failed.

The following *two hundred and eight* passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students:—

| | |
|---|---|
| Alford, Edward | Plymouth. |
| Anderson, Eric | Forres. |
| Anderson, William | Middlesbrough. |
| Aram, Charles Baxter | Wellingore. |
| Arnott, Robert Edgar | Pontypridd. |
| Ashcroft, Alfred William | West Leigh. |
| Aspinall, Thomas | Platt Bridge. |
| Atkinson, Fred. Cheesebrough | Penrith. |
| Avery, Cuthbert Johnson | Birmingham. |
| Barter, Harold George | Hayle. |
| Barton, Harold | Southport. |
| Batt, Cuthbert Stanley P. | Southsea. |
| Battle, John Cyril Marfleet | London. |
| Baynes, Herbert Varley | Bedale. |
| Bell, Charles Edward | Stapleford. |
| Berry, William Henry | Manchester. |
| Binks, Thomas Coates | Castleford. |
| Blackwell, Henry | Gt. Bridge. |
| Blaker, Ernest James | Ashford. |
| Booth, Herbert Cyril Swanley | St. Albans. |
| Bosward, George Goodrick | Gateshead. |
| Bowman, Alexander Nasmyth | Cardenden. |
| Boxall, Thomas William | Cosham. |
| Brown, Alfred Pearson | Kelso. |
| Bryan, Howard William | Marshfield. |
| Buckingham, Frank Edward | Harleston. |
| Burdekin, William Frederick | York. |
| Burr, Patrick | Aberdeen. |
| Burrows, Frank | Ilkeston. |
| Butler, Chas. Herbert Weston | St. Neots. |
| Caird, James | Stonehaven. |
| Campion, Bernard Hugh | Harlow. |
| Cellars, William | Edinburgh. |
| Chambers, George Henry | Eastwood. |
| Chandler, Richard Walter | Bristol. |
| Chapman, Frank | Aylesbury. |
| Clay, William Joseph | Nottingham. |
| Clutterbuck, George Lionel | Hereford. |
| Coe, Arthur Edward | King's Lynn. |
| Collins, Clifford | Ipswich. |
| Coulshed, Wilfred | Orrell. |
| Cox, Thomas Finchett | Edinburgh. |
| Cummings, Robert | Edinburgh. |
| Cundall, Edward | York. |
| Cunliffe, Sam | Lancaster. |
| Dance, Gilbert Abel | Cardiff. |
| Davies, John Henry | Flint. |
| Dawson, Arthur Taylor | Dewsbury. |
| Denton, Joseph | Ilkley. |
| Derbyshire, Charles Henry | Middlewich. |
| Donald, Joseph | Glasgow. |
| Drayton, George Selby | Bridport. |
| Duncan, William Balderston | Portobello. |
| Dunstan, Sydney | London. |
| Dupuy, Edwin Stephen | Guernsey. |
| Durrant, George Stuart | London. |
| English, Robert Coulson | Pickering. |
| Ewell, Ernest William | Dover. |
| Fairless, William Edward | Newton-le-Willows. |
| Fawn, Frank | Holbeach. |
| Fenn, George | Ipswich. |
| Fortnam, Walter John | Willenhall. |
| Foster, Frederick | Kidderminster. |
| France, James Hassall | Rotherham. |
| Gass, Arthur Gilpin | Whitehaven. |
| Gaze, William Ernest | Bury St. Edmunds. |
| Gee, James Edwin | Macclesfield. |
| George, William Blissett | Southwell. |
| Gibson, William Wightman | Buckie. |
| Gilmour, Andrew | Govan. |
| Goldsworthy, George Henry | Birmingham. |
| Gordon, Charles | Strathdon. |
| Gordon, David | Liverpool. |
| Grant, Peter | Aberdeen. |
| Grierson, William Thomas | Penrith. |
| Grosskopf, Gustavus Adolphus | Manchester. |
| Hague, Ernest Walter | Rawmarsh. |
| Halket, James | New Byth. |
| Hallam, Albert Ernest | Leicester. |
| Harrison, William Thomas | Lincoln. |
| Hartley, Albert Edward | Barrowford. |
| Haworth, Harry | Blackburn. |
| Heath, Sidney | Crumpsall. |
| Hedger, Harry Ormsby | Worthing. |
| Henderson, William | Dollar. |
| Hendry, William Black | Edinburgh. |
| Herd, Agnes | Ambleside. |
| Hinks, Frederick Chas. Edwd. | Old Swindon. |
| Hirschberg, Alfred | Dundee. |
| Hirst, Edward | Colne. |
| Hodgson, Baron Cuthbert | Halifax. |

Hodgson, Walter Ishmael......West Hartlepool.
Hodson, William..................Louth.
Holland, George Arthur ......Scunthorpe.
Holliday, Donald ..... .........Maryport.
Horrocks, William Edward ...Eccles.
Howell, Edward Oswald ......Sheffield.
Humphreys, Evan Llewellyn ..Corwen.
Hutchinson, William Arthur...Leyland.
Inger, Arthur .......................Lincoln.
Jackson, Robert ..................Stirling.
Jacobs, David .......................Linthorpe.
Johnston, John William ......Whitehaven.
Johnston, Robert Bathgate ...Methil.
Johnstone, Robert ...............St. Andrews.
Jones, Frederick James.........Runcorn.
Jones, John Closs ...............Fachwen.
Jones, Trevor C. ..................Denbigh.
Keast, Bertram Archibald ...Cwmbach.
Keeble, Arton ......................Leeds.
Kendall, Ernest Henry.........Oundle.
Kerr, Robert L. ..................Greenock.
Kerrison, Albert ..................Sunderland.
Kirkby, Frank......................Boston.
Knight, Richard....................Launceston.
Latham, Frank .................. London.
Legg, May Vanstone ... ........Cheltenham.
Lenton, John Herbert .........Witney.
Leslie, William Paterson ......Stromness.
Lewis, John .........................Ogmore Vale.
Lloyd, Hugh .......................Ruthin.
Lucas, Arthur ......................Blackburn.
Larcock, George Arthur ......London.
Lush, Frederick Albert Chas...Dorchester.
Lüth, Victor Frank...............Glasgow.
McDonald, David Baird.........Glasgow.
McDonald, Robert ...............Elgin.
Mackintosh, John Dickens ...Ashton-under-Lyne.
Mason, Peter ......................Peebles.
Mason, Wilfrid Martin .........Wolverhampton.
Masson, Hedley George.........Torquay.
Masters, Herbert Bazeley ......Bristol.
Mather, Margaret Alice.........Leamington.
Matthews, Hedley Franklin...Middlesbro'-on-Tees.
Meldrum, Martin ............ .Crossford.
Milne, Robert Thomas .........Banff.
Minikin, John Wm. Stafford...Newcastle-on-Tyne.
Moore, Francis Henry .........London.
Moore, Thomas Henry .........Grimsby.
Neill, Adam Cassels ............Haddington.
Newall, Joseph ..................Dalbeattie.
Offord, Thomas Henry .........London.
Pagan, Thomas ...................Lochmaben.
Parker, Christopher ............Skelton.
Parry, William Henry ....... .Llanbedr.
Paterson, George Derwent ...Workington.
Paterson, John ..................Aberdeen.
Philp, George .......................Dunfermline.
Prebble, Ernest ...................Douglas.
Pringle, James......... ...... ...Crieff.
Purdie, Percy Wilfred .........London.
Rae, Percy Sowerby ............Cardiff.
Raine, Constance Ethel.........Birmingham.
Raw, Herbert .......................Thornton.
Raynes, Robert ...................Brockley.
Riches, Richard Percival ......Preston.
Roberts, John .......................Denton.
Roberts, John Thomas .........Llanrwst.
Roberts, William James ......Llanfairfechan.
Robertson, William ............Insch.
Room, Frederick Rupert ......Birmingham.
Roper, Frederick Thomas ......Kington.
Rowe, George Arthur Stanley.Narberth.
Rutherford, Ernest William ...Pulborough.
Scott, Walter Harrison .........Ilminster.
Sequeira, Septimus Willie......London.
Shaw, Frederick Bertram......Holmfirth.
Shaw, William.......................Aberdeen.
Sherriffs, Alexander ............Glasgow.
Sill, John Westgarth ............Bowness.
Silvester, Henry Cooke .........Worksop.
Silz, Oscar ..........................London.
Slatter, Wilfred Thomas ......Winchcombe.
Smith, Gilbert .......................Rowley Regis.
Smith, Norman Tenison ......Ryde.
Stansfield, John Lord .........Newchurch.
Stephens, Ernest Hutton ......Sunderland.
Stobie, James Russell .........Dundee.
Summers, George Edward......Derby.
Swan, William.......................Dumfries.
Swann, William B................Barrow-in-Furness.
Tattersall, William Christie...Dorking.
Thomas, Alfred Ernest .........Rotherham.
Thomas, Morgan William ......Usk.
Thompson, James ...............Blackburn.
Thomson, James Hay .........Fochabers.
Tierney, Frank.......................Marple.
Topping, Edmund ...............Bury.
Trunchion, Herbert Fawdon...London.
Waddingham, George Albert..Batley.
Wade, Margaret C.................Larbert.
Walden, Mark Eason ............Peterborough.
Walker, Euphemia ...............Saltcoats.
Walker, Henry.......................Aberdeen.
Warmington, Robert William. Barrow-in-Furness.
Watson, David.......................Glasgow.
Weir, Alexander............ .....Peebles.
Wendon, William ...............Totnes.
West, Harold .......................Eastwood.
Whittle, Hugh.......................Manchester.
Williams, John Matthew ......Bangor.
Williamson, David ......... .....Douglas.
Wilson, Alexander Samuel ...Gt. Yarmouth.
Wilson, Frederic William......Birmingham.
Wilson, Ralph .......................Dunfermline.
Wilson, William Henderson...Whitby.
Wise, Walter Frederick ......London.
Wood, William ...................Montrose.

The questions set at this examination were published in the *Pharmaceutical Journal* for July 15, p. 54.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

| | Candidates. | | | | Candidates. | | |
|---|---|---|---|---|---|---|---|
| | Examined. | Passed. | Failed. | | Examined. | Passed. | Failed. |
| Aberdeen | 19 | 11 | 8 | Kirkwall | 2 | 1 | 1 |
| Aberystwith | 1 | 0 | 1 | Lancaster | 9 | 7 | 2 |
| Birmingham | 22 | 11 | 11 | Leeds | 18 | 7 | 11 |
| Brighton | 1 | 1 | 0 | Lincoln | 8 | 4 | 4 |
| Bristol | 10 | 4 | 6 | Liverpool | 12 | 7 | 5 |
| Cambridge | 1 | 1 | 0 | London | 43 | 18 | 25 |
| Canterbury | 4 | 2 | 2 | Manchester | 36 | 22 | 14 |
| Cardiff | 11 | 7 | 4 | Newcastle-on-T. | 7 | 4 | 3 |
| Carlisle | 14 | 10 | 4 | Northampton | 4 | 0 | 4 |
| Carmarthen | 7 | 1 | 6 | Norwich | 6 | 5 | 1 |
| Carnarvon | 7 | 5 | 2 | Nottingham | 11 | 8 | 3 |
| Cheltenham | 3 | 2 | 1 | Oxford | 3 | 1 | 2 |
| Darlington | 7 | 4 | 3 | Penzance | 2 | 1 | 1 |
| Douglas | 2 | 2 | 0 | Peterborough | 7 | 4 | 3 |
| Dundee | 14 | 6 | 8 | Plymouth | 4 | 2 | 2 |
| Edinburgh | 30 | 15 | 15 | Sheffield | 10 | 5 | 5 |
| Exeter | 6 | 3 | 3 | Shrewsbury | 2 | 1 | 1 |
| Glasgow | 24 | 9 | 15 | Southampton | 8 | 4 | 4 |
| Guernsey | 1 | 1 | 0 | Worcester | 4 | 1 | 3 |
| Hull | 5 | 3 | 2 | York | 9 | 5 | 4 |
| Inverness | 4 | 3 | 1 | | | | |

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination :—

| | |
|---|---|
| Arker, Thomas Alexander | Davenham. |
| Beer, Bernard | East Dereham. |
| Bown, William Henry | Frome. |
| Carlé, George Henry Thomas | London. |
| Dyas, James Edmund | Bromley. |
| Greenville, Ernest Gould | Birmingham. |
| Lacy, Arthur | Hackney. |
| Lister, Frederick Spencer | Cambridge. |
| Warren, Frank | Southwick. |
| Whysall, Edward Searson | Grantham. |
| Whysall, George Ernest | Grantham. |

## COUNCIL PRIZES EXAMINATION QUESTIONS.

*July* 27, 1893.

### BOTANY AND MATERIA MEDICA.

*Time*—10 *a.m. to* 1 *p.m.*

#### BOTANY.

1. Give an account of the formation, composition, and function of starch, and the manner in which it is made available for the service of the plant. In what natural order is starch absent, and by what substance is it replaced?

2. State what you know of the life-history of a moss.

3. Give a comparative account, with diagrams, of the structure of the flower in the poppy, rose, fox-glove, and lily.

4. What are zygospores? How are they formed? In what orders do they occur?

#### MATERIA MEDICA.

1. The seeds of different species of strophanthus, some of which are inert, occur in a mixed state in commerce. How may the genuine be recognised? What test would you apply to prove the presence of strophanthin? Mention the botanical source, natural order, and habitat of the official strophanthus.

2. Give the names, natural orders, and habitats of plants yielding caffeine. State the percentage of alkaloid in each case.

3. Explain the relationship between atropine, daturine, hyoscyamine, and hyoscine. From what plants can they be obtained? What is homatropine? How is it prepared?

4. What is the origin of yellow wax? What is its chemical composition and melting point? How should you ascertain its purity?

### CHEMISTRY.

*Time*—2 *to* 5 *p.m.*

1. Describe three distinct methods by which the atomic weight of an element may be determined.

2. Give at least two processes besides the official one for the preparation of chloroform. What is its relation to marsh gas? What are its principal impurities? Indicate their origin and describe some processes for their removal.

3. Define respectively an amine, imine, amide, and imide, giving structural formulæ and examples of each.

4. Describe a process for the synthesis from purely inorganic materials of methyl alcohol, explaining the same by means of formulæ and equations.

5. Show how ethyl sulphovinate differs from ethyl sulphonate, and explain by what characters the latter differs from the metameric ethyl hydrogen sulphite.

6. Write a full account of the chemical changes that occur and the properties of the substances formed in carrying out the following experiment:—(*a*) Mercury is dissolved in nitric acid. (*b*) The resulting liquid is evaporated to dryness. (*c*) The residue is strongly heated in a glass tube.

# Proceedings of Societies in Londo

## ROYAL INSTITUTION.

### THEORY AND PRACTICE IN ELECTRICAL SCIENCE.*

BY ALEXANDER SIEMENS, ESQ., M INST.C.E. M.R.I.

(*Concluded from page* 75.)

As an illustration of the distribution of power b electricity I will briefly describe some radical alte tions that have been made at the works of Mess Siemens Brothers and Co. by the introduction of ele tric motors in the place of steam engines. The di gram on the wall shows in outline the various buil ings in which work of different kinds is carried o with the help of different machines. Electric moto are supplying the power, sometimes by driving shaf ing to which a group of tools is connected by beltin and sometimes by being coupled direct to the movi mechanism. Each section of the works has its ow meter measuring the energy that is used there, and a of them are connected by underground cables to central station, where three sets of engines an dynamos generate the electric current for all pu poses.

There are two Willans and one Belliss steam engine each of 300 I.H.P., coupled direct to the dynamos a running at a speed of 350 revolutions per minute.

Room is left for a fourth set; but, including some auxiliary pumps and the switchboards for controlling the dynamos and for distributing the current, the whole space occupied by 1200 horse-power measures only 32 by 42 feet.

Close by are the condensers and three high-pressure boilers, which have replaced some low-pressure ones formerly used for some steam engines driving the machinery in the nearest building.

The advantages that have been secured by the introduction of electric motors may be briefly stated under the following heads:—

1. Various valuable spaces formerly occupied by steam engines and boilers have been made available for the extension of workshops, and these are indicated on the diagram by shading.

2. By abolishing to a great extent the mechanical transmission of power a considerable saving is effected in motive power, which is especially noticeable at times when part only of the machinery is in use.

3. As the electic motors take only as much current as is actually required for the work they are doing, a further saving is effected, and at the same time the facility with which the speed of the motors can be altered without their interfering with each other, presents a feature that is absent from mechanical transmission.

4. The big steam engines, being compound and condensing, produce a horse-power with a smaller consumption of fuel than the small high-pressure steam engines scattered throughout the works.

5. The numerous attendants of the old steam engines and boilers have mostly been transferred to other work; only a few of them are required at the central station, and one or two men can easily look after all the electric motors used in the various parts of the works.

Elsewhere, equally favourable results have been obtained by the introduction of electrical distribution of power, and in this respect I beg to refer you to a paper read before the German Institution of Civil Engineers by Mr. E. Hartmann in April of last year, and to a paper read by Mr. Castermans before the Society of Engineers in Liège in August last, in which he compares in detail various methods of transmission of power, of which the electrical one was adopted for a new small arms factory.

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* Lecture delivered on Friday, February 3, 1893.

We may, therefore, take it for granted that the advantages alluded to above have not resulted from local circumstances at Woolwich, but that they can be realised anywhere by the adoption of the electric current for distributing power from a central station. At first sight this result appears to be of interest only to the manufacturer, but the development of this idea may lead to far-reaching consequences when we consider that cheap power is one of the most important requisites for cheap production. You can see on the diagram that the various buildings are separated by roads, and we can easily imagine that in each of them an independent owner carries on work, so that the diagram represents part of a manufacturing town.

While power was generated by steam engines, the cost of producing one horse-power varied a good deal in the different parts, and the various owners could not have obtained their power on equal terms, those possessing the largest steam engines having a distinct advantage. This inequality is done away with altogether when the power is distributed by electricity, as the current can be supplied for large or small powers at the same rate per Board of Trade unit. It is therefore clear that the establishment of central stations for the generation of electricity on a large scale will bring about the possibility of small works competing with large works in quite a number of trades, where cheap power is of the first consideration.

Another circumstance favouring small works is the diminution of capital outlay brought about by the employment of electric motors. Not only are the motors cheaper than boilers and steam engines of corresponding power would be, but the outlay for belting and shafts is saved, and the structure of the building need not be as substantial as is necessary where belts and shafting have to be supported by it.

A commencement has already been made in this direction by the starting of electric light stations, where the owners do all in their power to encourage the use of the current in motors in order to keep the machinery at their central station more uniformly at work.

The introduction of electricity as motive power will apparently present a strong contrast to the effect steam has had on the development of industries for the reasons already stated; and, in addition, there are many cases where the erection of boilers and steam engines, or even of gas engines, would be inadmissible on account of want of space or of the nuisances that are inseparable from them. Motive power will, therefore, be available in a number of instances where up to the present time no mechanical power could be used, but the work had to be done by manual labour or not at all.

You may have noticed that I have confined my remarks hitherto to the case of distributing electricity over a limited area, but that I have not yet discussed the question of transmitting power to a great distance.

Theoretically, we have been told over and over again that the motive power of the future will be supplied by waterfalls, and that their power can be made available over large areas by means of electric currents. As a prominent example, the installation is constantly mentioned by which the power of a turbine at Lauffen was transmitted over a distance of 110 statute miles to the Frankfurt Exhibition with an efficiency of 75 per cent. No doubt this result is very gratifying from a purely scientific point of view, but, unfortunately, in practical life only commercially successful applications of science will have a lasting influence, and in this respect the Lauffen installation left much to be desired.

On the one hand science tells us that the section of the conductor can be diminished as the pressure of electricity is increased, and it appears to be only necessary to construct apparatus for generating electricity at a sufficiently high pressure so as to reduce the cost of a long conductor to reasonable limits. On the other hand, experience shows that at these high potentials the insulation of the electric current becomes a most difficult problem, and for practical purposes difficulty means an increased outlay of money. As an illustration of the difficulties encountered in the employment of high-tension currents, I can demonstrate to you that many of the insulating materials employed with success for low-pressure currents break down under the strain of high-pressure electricity.

For the purpose of these experiments the current of electricity delivered by the street main at a pressure of 2,400 volts is diverted to a large transformer placed on the ground-floor, and from there it is led through a twin cable to this room at a pressure which can be increased up to 50,000 volts. This twin cable was used in 1891 at the Frankfurt Exhibition, for conveying a current of 20,000 volts from the main Exhibition to the Exhibition on the Main, and when it was returned to the works, it was found that the insulation was as good as when it was first manufactured. A sample of it lies on the table, and by its side the sample of a concentric cable designed for a current of 2,500 volts. A comparison of the two shows in a striking manner how elaborately high-tension cables have to be insulated.

By the first experiment I will try to show you how the space surrounding a conductor connected to a source of high-pressure electricity is, so to speak, filled with electric stresses, that become visible when a vacuum tube is brought near the conductor. This experiment was shown here by Nikola Tesla in connection with his lecture on alternate currents of high frequency; but I want to show you that high tension and low frequency produce the same effect.

The next experiment was suggested by Dr. Obach, and a diagram of the apparatus employed in it is shown. A copper conductor (thickly insulated with india-rubber) is placed in a brass tube, and the annular space between them is filled with coloured water which communicates with a vertical glass tube inserted in the centre of the horizontal brass tube. One conductor from the high-tension transformer is connected to the insulated copper conductor, and the other to the brass tube. Under these conditions no current passes, but the electric stress heats the insulating material, which shows itself by the rise of the coloured liquid in the glass tube.

Werner Siemens called attention to this phenomenon in a paper contributed to Poggendorf's Annalen in 1857, in which he communicated a series of experiments on electrostatic induction, proving, as he expressly stated, the correctness of Faraday's theory of molecular induction.

Not very long ago Signor Riccardo Arno showed that a cylinder of insulating material, brought under the influence of a rotary field and suitably suspended, would commence to revolve, thus showing that molecular movement was set up in it. He produced this effect by means of an apparatus, a copy of which you see before you. A hollow cylinder of gutta-percha is suspended on the point of a needle, so that it can be made to turn with very little friction. Around it are placed four vertical metal strips to which the high-tension current is brought. Between the two terminals of the high-tension circuit, a connection is made by an inductionless resistance in the shape of a U-tube filled with water and a condenser. Two of the metal strips opposite each other are joined to the ends of the inductionless resistance and the other two strips are connected to the condenser. In this way there is a difference of a quarter of a phase between the two currents, and a rotating field is produced, which causes the cylinder to revolve an account of the electrical hysteresis set up. When the current is reversed the cylinder revolves in the opposite direction. This result also obtains in the case of a glass beaker which is inverted and supported by a pin-point.

Wood, slate, and marble are usually reckoned to be insulating materials, but you will see that they do not offer a protracted resistance to a current of high potential. When the electric spark passes through marble it converts the carbonate of lime into quicklime, as can readily be shown by moistening the broken surface with phenolphthalein, which leaves the carbonate of lime white and colours the quicklime a beautiful pink colour. Even glass is pierced; and we must confess that at present we have no very reliable means of dealing with electricity of very high pressure.

Enough has been shown, however, to prove that by utilising electricity we can extend the employment of natural forces for procuring the necessaries of life; and our experience shows that every time this has been done in the past, the burden of manual labour has been lightened, and the comforts of mind and body have been made more accessible to the toiling multitude. In one word, all real and lasting progress is based on the practical application of scientific knowledge.

## Provincial Transactions.

### CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

On Thursday, July 13, the members of the above Association made an excursion to Haslingfield, some proceeding by boat up the picturesque Granta, others by road viâ Harston. Tea was provided at the "Marquis of Granby," after which the party visited the chalk-pit in search of specimens, a large number being found.

## Parliamentary and Law Proceedings.

### PROSECUTION UNDER THE SALE OF FOOD AND DRUGS ACT.

#### SODA WATER NOT OF B.P. STRENGTH.

On Friday, the 21st inst., Mr. Biron, Q.C., the magistrate at the Lambeth Police Court, had before him a summons taken out by Inspector Groom, on behalf of the Camberwell Vestry, charging Mr. Eugène Compigné, a chemist, of 262, Camberwell Road, with selling soda water not of the nature, substance, and quality demanded by the purchaser.

Mr. Marsden appeared in support of the summons, and Mr. Ivor Bowen defended.

Mr. William Edwin Groom deposed to purchasing a syphon of soda water at the defendant's shop on June 14. He divided the contents of the syphon into three parts and sealed each bottle, one of which he left with the defendant, one he kept himself, and the third he took to the public analyst.

Mr. Marsden: What did you ask for?—A bottle of soda water.

Did you tell the defendant for what purpose you purchased it?—I told him that it was for the purpose of being analysed by the public analyst. I put in the certificate, which states that it contains 1½ grain of bicarbonate of soda to the pint, and that it ought to contain 30 grains to the pint.

Have you looked into the British Pharmacopœia?—I have

What should soda water contain according to th
30 grains.

Cross-examined by Mr. Bowen: Did you say wh
you asked for the soda water that you required it
any other purpose save that of analysis?—I said
wanted it for the purpose of analysis.

Apart from your position as an inspector under
Act, what kind of soda water do you drink as a rule
B.P. strength or what?—I cannot tell at all. I exp
to get B.P. soda water from the chemist's.

The Magistrate: It is not a question of what
drinks; but where is the authority for saying that
definition in the B.P. is the thing that you are entit
to have when you ask for soda water. That is
intelligible proposition, and I should like to have
explained.

Mr. Bowen: Under what section of the Act do y
wish the court to believe that when you ask for so
water you are supposed to get B.P. soda water?—
naturally expect it.

The Magistrate: He says it is not of the natu
substance, or quality of soda water, but he says th
because he looks into the British Pharmacopœia
sees that according to that book 30 grains of so
must be found in a pint of it, whereas this samp
only contains 1½ grain. That is his propositi
Whether that entitles the complainant to an order
not is what I am waiting to hear.

Mr. Bowen (to the witness): Just turn to the preface of the Pharmacopœia. Do you not see there that it is a book containing a list of medicinal compounds.

The Magistrate: I know that much about it. (To the witness): Is this a chemist's shop?—Yes, in the main road; in the Camberwell Road.

Mr. Bowen: Did you look round that shop when you went in? Did you see that there were other articles exposed for sale in the shop besides medicines?—It was an ordinary chemist's shop.

A large quantity of syphons were standing on the floor?—Yes.

You saw in that shop other commodities which were in all probability not medicines?—I did not notice particularly.

Mr. Marsden: I have not my analysts in court. If you think it requisite, sir, I will ask you to adjourn the case in order that I may call scientific evidence as to what soda water should consist of.

The Magistrate: In the British Pharmacopœia it is defined to be water with 30 grains of soda to the pint.

Mr. Marsden: I will ask your worship to adjourn the case in order that I may call scientific evidence as to what soda water sold by a chemist should consist of.

The Magistrate: It will cost you something if I do. It must only be upon terms.

Mr. Marsden: Under those circumstances, if I have to pay the costs I will go on with the case. That is my case.

Mr. Bowen: I am going to call the editor of the Pharmacopœia to prove what is admittedly the fact, that when soda water is ordered by a doctor and asked for by certain persons as medicine the proper solution of soda to be given as a medicine is that prescribed by the British Pharmacopœia.

The Magistrate: With 30 grains of soda it would be very nasty, would it not?

Mr. Bowen: Yes. I am going to produce two samples of soda water, both kinds being sold by this particular chemist. If a customer goes to the shop and asks for medicinal soda water he gets the B.P., and if he is satisfied with it he is a fortunate man. The B.P. soda water is labelled "Soda water, B.P., 30 grains to the pint." The ordinary soda water of commerce is a soda water containing a very small quantity, because any larger quantity would make it nauseous. There is just one other circumstance that I should like to mention, and that is this, after this prosecution was comenced the defendant rejected all the ordinary soda ater that he had been using, and sent for a supply the B.P. soda water. The consequence of his ing this was that he received a large number of tters from his customers complaining of the soda ater.

**The Magistrate**: It made his customers very unwell, suppose?

**Mr. Bowen**: Yes. One lady writes: "I cannot ally drink such nasty stuff." I will now call the efendant.

**The Magistrate**: I can do without any more witsses. This summons must be dismissed. A little o much zeal has been displayed.

On application by Mr. Bowen for costs, the Magisrate said he could not grant them, the vestry having nly performed a public duty.

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### PROCEEDINGS UNDER THE PHARMACY ACT.

At Oldham County Court, on Thurday last, Matthew Marsden, of 82, Huddersfield Road, was sued by the Council of the Pharmaceutical Society for keeping open shop for the retailing, etc., of poison, contrary to the provisions of the Pharmacy Act, 1868. Defendant did not appear and, the case being proved, judgment was given for the usual penalty, with costs on the higher scale.

## Obituary.

### THOMAS SMITH, L.R.C.S.E.

As briefly announced in last week's Journal, Mr. Thomas Smith, of Edinburgh, who had been a life-member of the Pharmaceutical Society since 1853, died on Wednesday, July 19. Mr. Smith was born on January 9, 1807, at Paisley, where his father was a shawl manufacturer. His father's family removed to Edinburgh, where Thomas, the ninth in a family of twelve, was apprenticed as a cabinet maker. His desire, however, was to study medicine, and with this object in view he started business as a druggist in the street in Edinburgh known as the Pleasance, and thus assisted himself through his college course. After taking his degree in 1828, he removed to Canonmills, where he practised for a time. In 1832 he was appointed a member of the Cholera Committee for the Canonmills district. His able and devoted services during the epidemic, which was specially severe in this locality, were recognised by the Town Council, who awarded him an honorarium of £40. He now removed to premises in Duke Street, where he was joined by his younger brother Henry, who had also taken a medical degree. Under the style of T. and H. Smith and Co. the brothers devoted themselves more and more to pure pharmacy, and discontinued medical practice. Thomas pursued researches in practical pharmaceutical chemistry with great eagerness and success, and gradually built up an important business as a manufacturing chemist, which is still carried on at the Blandfield Chemical Works, Edinburgh. The various contributions which have appeared in the *Pharmaceutical Journal* on such subjects as opium alkaloids, aloin, senna, etc., were always published in the name of the firm, but it was pretty generally understood that the work was done by Thomas Smith. Among his original discoveries may be mentioned aloin and cryptopine. He also devoted considerable attention to the active constituents of aconite and senna. About twelve years ago he retired from the firm, but continued to devote himself assiduously to pharmaceutical research in a private, completely-fitted laboratory in his house at Heriot Hill. His intense interest in this his lifelong hobby continued up till the very end. He possessed a great fund of practical information on pharmaceutical processes and the methods of obtaining the active principles of medicinal plants, as well as their characteristics. Owing to his retiring disposition, however, this was not widely known. He could not be induced to write down what he knew, and much information of value has undoubtedly passed away with him. A student at Surgeon's Hall, Mr. Smith studied anatomy under Dr. John Barclay and the celebrated Dr. Robert Knox, his class tickets dating from 1824 to 1827, embracing, therefore, the excited period after the discovery of the murders of the notorious Burke and Hare. He used to relate—as an instance of devotion to work—that going on one occasion into Surgeon's Square about midnight he found a solitary worker busy in the dissecting room, the man who was afterwards known as Sir William Ferguson, the eminent surgeon. Mr. Smith was a man of strict integrity and thorough uprightness, painstaking in matters of detail, and methodical almost to a fault. Of a retiring disposition, he took no part in public affairs, but had pronounced views, which in politics were Conservative. He was probably the oldest member of Greenside Church, having worshipped with that congregation when it met in the Calton Convening Rooms, Waterloo Place.

Notice has also been received of the death of the following:—

On the 21st of July, George William Shrubsole, Chemist and Druggist, Chester. Aged 66 years. Mr. Shrubsole had been a member of the Pharmaceutical Society since 1888, and was well-known for the interest he took in the natural sciences and antiquarian research. As a student in the Society's School he gained prizes in Pharmacy and Materia Medica, besides a certificate of merit in Chemistry, and he was one of the earliest candidates who passed the Minor examination, his certificate being number twenty-four.

On the 25th of July, Richard Ashworth, Chemist and Druggist, Blackpool. Aged 39 years.

## Correspondence.

**** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### ERRONEOUS IDEAS OF THE PHARMACY ACT.

Sir,—I am in receipt of a copy of the *Pharmaceutical Journal* of Saturday last, with a marked leading article, under the heading "Erroneous ideas of the Pharmacy Act," in which my name appears several times in reference to an inquest I held, and with respect to some observations I was reported in the *Echo* to have made respecting the sale of poisons and the Acts of Parliament relating thereto. I have read the article in question, and find that the writer perpetuates and adopts the erroneous report of the case, which appeared, according to your article, in the *Echo*, although I have not seen the paper alluded to. To begin with, it was a case of determined suicide by oxalic acid and hydrochloric acid, and there was nothing "accidental" about the case at all, and no such verdict as you record was returned by the jury. The oxalic acid was presumably purchased by the deceased, and was brought home by him wrapped up in a piece of paper without label of any kind whatever; the hydrochloric acid was also brought home by the deceased in a public-house spirit bottle, and the only label this bottle had was one of a public-house in the neighbourhood. The deceased asked his wife to mix some "salts" for him, giving her the oxalic acid crystals, which she thought were Epsom salts. He then added to the draught some of the contents of the bottle, which he told his wife was whisky. The verdict of the jury was that "the deceased committed *suicide* whilst of unsound mind at the time." In answer to observations from jurymen, I observed that spirits of salt and oxalic acid could be purchased, and were frequently sold at oil shops in packets and bottles without any labels or any other indication to show that the contents were poisonous. I referred also to the two schedules of poisons, and to the regulations required by the Pharmacy Act of 1868, to be observed in selling by retail and dispensing poisons. I further stated that all such poisons and many others which were now procurable at oil and other shops should be sold only by duly qualified chemists, and I added that if this were in force, the bottle and paper containing the poisons which caused the death of the deceased would have been properly labelled. I am quite familiar with the Pharmacy Acts, and the accuracy of my remarks on this subject may be estimated by the general inaccuracy of the report upon which your writer appears to have based his article. Years ago I used occasionally to write and correct errors in reports and in supposed utterances of mine; but of late years I have given up this practice, as I have neither time nor inclination for the work. I hold between thirty and forty inquests per week, and I seldom see the newspaper reports of them. As regards the report sent to the *Echo* on the case in question, the reporter who sent it tells me that on the occasion he sent reports of two inquests, one of which was suicide, the other accidental. He can only presume that one of the sub-editors must have looked at the top and bottom of his paper, and condensed the reports into the curious one which fell into your hands. Some editors of journals when observing such reports have, before writing their article, sent me cuttings of the case, and asking if the same were correct. I observe that the *Echo* report was also copied by some of the local papers, giving much satisfaction no doubt to the relatives of the deceased man.

GEORGE DANFORD THOMAS, M.D., *Coroner*.

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### THE MEDICINE STAMP DUTY.

Sir,—The utility of such a discussion as that raised by Mr. Forret may be fairly questioned when it descends to a mere battle about words. "Why should we rest content with an interpretation of the Act which compels us to adopt such a monstrosity in grammar as Bland Pills?" asks Mr. Forret. But the Board does not ask, far less compel, chemists to commit such an outrage on grammar. The Board does not, as Mr. Forret avers, compel us to label iron pills "Bland Pills." The Board is rather meagre, perhaps too meagre, with its suggestions as to how we are to word our labels. I was told, for instance, in reply to a query as to the words rendering a certain label liable to duty, that it was not the duty of the Board to tell chemists how they might evade the Medicine Stamp Duty. If the law is to be administered fairly, it must be administered consistently. If "Bland's Pills" are not liable, then neither are "Abernethy's," "Anderson's," "Barclay's," etc., etc., for the recipes for such are found in standard works. The Board is ready to tell us when our labels are liable, and this is all that can fairly be expected. Mr. Forret seems to forget that the public very soon adopts the nomenclature of the trade. If the Board follows the only consistent course open to it by including all proprietaries as liable to stamp duty, chemists on their part should follow the consistent course and design these pills as they are now officially designated, "I Pills." It is to be regretted that the names "Blan Pills," "Easton's Syrup," etc., should have become rent, now that such titles incur liability, but as we are on an equal footing, no one loses when the names universally changed. I am more concerned about recent action of the Inland Revenue officials regard B.P. preparations, when a fine was threatened for the of syrup of iodide of iron. In reply to a remonstrance Board stated: "Pharmacopœia preparations are equ liable with other articles if brought within the charge being recommended for the cure or relief of any ailme or diseases, or by being advertised as proprietary." T syrup was neither advertised nor labelled as a propriet It was simply labelled "Syrup of Iodide of Iron," and, a price list, stated as useful in scrofula and affections of glands. How "Quinine and Iron Tonic, enriching purifying the blood, etc.," can pass the Board, and a B.P. syrup, because it can be used for scrofula, needs pay toll, passes my comprehension. How the one not a B.P. preparation—can be recommended for enrich ing and purifying the blood, and thus used for the cure one of the most prevalent disorders or ailments, anæm unstamped, while the other, a B.P. syrup, must stamped, is something I cannot understand.

*Edinburgh*. WILLIAM S. GLASS.

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### GLYCERIN SUPPOSITORIES.

Sir,—In your last issue an article on the above subj interested me very much. I have made the suppositori several times and with unvarying results, and in ma cases totally different to those described in your artic and should like to know the reason why the experimen are not concordant. Decker states in regard to Remin ton's formula that with hydrated carbonate of soda obtains an opaque suppository—mine always have be perfectly transparent. Secondly, he says chill thoroughl a procedure I have never found necessary, the difficul being in preventing premature solidification, and the resul ing product is as hard as cocoa butter. The liquid ma after the effervescence had subsided showed signs gelatinising even at temperature of 212°. I find no su gestion for obviating the latter in the paper, but ha found the hydrate of sodium answers better, causing al the disappearance of the frothy curd noticed when the ca bonate is used. With regard to the coating of the su pository, I have found waxed paper to answer admirabl and it certainly has the advantage over collodium of bei easily removed and not presenting an objectionable surfa to the metal cavity. The criticism upon the B.P. formu needs support, as I find on the contrary that prac tioners state that they find the saponaceous base far mo insoluble, and thus the advantage of the high percenta of the glycerin in the old formula is questionable. conclusion, I cannot help thinking that if more of the practical essays upon real difficulties appeared, stude of pharmacy would benefit greatly. I should a like to know why they all have their birth on the oth side of the Atlantic.

*Barnstaple*. E. C. ANGEL.

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*F. B. Caswell*.—You letter has been passed to the proper quarter, and will be dealt with in due course.

*J. Theckston*.—Your letter should have been addressed to the advertisement agents, to whom we have forwarded it.

*F. W. Doubleday*.—In the "Extra Pharmacopœia" you will find a number of references to journals containing information on the subject.

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## BOOK RECEIVED.

CATALOGUE OF THE LIBRARY AND MUSEUM OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. July, 1893. Pp. 32. London: Harrison and Sons. 1s. From the Secretary.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Bolton, Duncan, Flückiger, Laurie, Naylor, Newsholme.

## BACTERIOLOGY FOR PHARMACISTS.

(*Continued from Vol. XXIII., page* 867).

### USE OF THE MICROSCOPE.

Since the microscope is the most important instrument used in bacteriological work, it is desirable that a full knowledge of the methods of using it so as to obtain the best results should be possessed by those intending to engage in such work, and especially is it essential that the question of illumination should be thoroughly understood. Though in the examination of an object to see some structure which is familiar to the observer or which he definitely knows to be present, the quality of the lenses employed, or the arrangement of the light may be conditions of but secondary importance, yet, on the other hand, it must be conceded that, in dealing with more or less unknown material, it is of the highest importance to neglect no technical detail, however slight, but to have the conditions as favourable as possible.

### ILLUMINATION OF MICROSCOPIC OBJECTS.

In modern histological practice all objects to be examined under the microscope are previously so prepared as to be translucent and so reveal the details of their structure when light is transmitted through them. Properly arranged working microscopes are therefore constructed with special reference to this method of illumination, which practically consists in intercepting the rays in a cone of light by the interposition of the prepared object. The ideal conditions are attained when the illuminating cone is strictly axial with regard to the body of the microscope and approximately equal to the aperture[*] of the objective used, whilst the object is placed at the apex of this cone. With such arrangements it would be found, on removing the eyepiece and looking down the tube of the microscope, that the back lens of the objective appeared as a disc of light, the disc extending to the very edge of the lens, which would thus be technically described as filled with light. With objects lacking contrast, such as thin tissues evenly coloured, such a light would be much too intense, and it is customary in practice to work with the light occupying not more than two-thirds or three-fourths of the area of the back lens of the objective.

To be able invariably to obtain the best results it is essential that the illuminating apparatus should be as perfect in its way and as skilfully manipulated as that employed for magnification. In addition to the actual source of light, plane and concave mirrors, a sub-stage condenser, an iris or other diaphragm, and a bull's-eye condenser, may be regarded as constituting a complete outfit for obtaining the best illuminating effects.

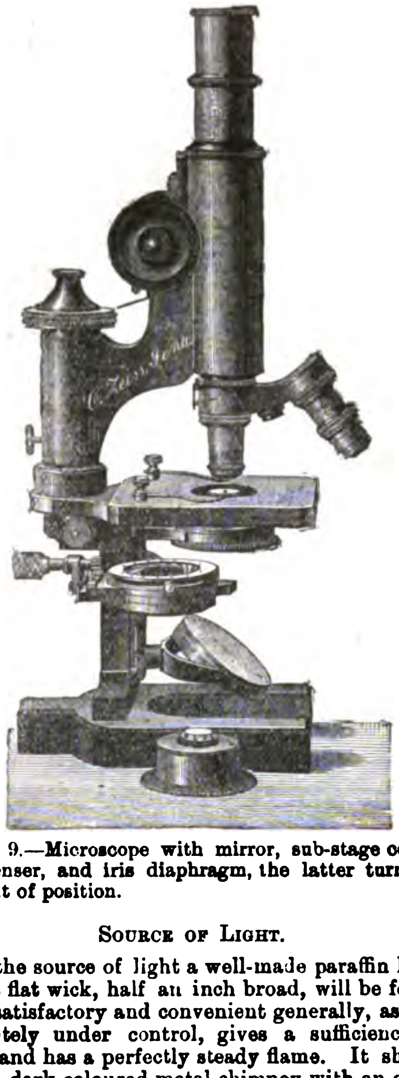

Fig. 9.—Microscope with mirror, sub-stage condenser, and iris diaphragm, the latter turned out of position.

### SOURCE OF LIGHT.

As the source of light a well-made paraffin lamp with a flat wick, half an inch broad, will be found most satisfactory and convenient generally, as it is absolutely under control, gives a sufficiency of light, and has a perfectly steady flame. It should have a dark coloured metal chimney with an opening at one side only to receive a slip of glass, which may be tinted blue to neutralise the yellow colour of the flame (see *Pharm. Journ.*, xxiii., p. 566). A cylinder of black cardboard with a similar opening may be slipped over an ordinary glass chimney instead, and will serve practically as well.

### USE OF THE MIRROR.

The simplest and most usual method of transmitting the rays of light through the object on the stage consists in receiving them from the lamp upon the surface of the plane or concave mirror, attached beneath the stage and arranged at a proper angle, and reflecting them thence towards the object. If the microscope be used in an erect position and the lamp be straight in front of it, when the mirror is placed at an angle of forty-five degrees and the flame is in a direct line with it, parallel to the table, the cone of rays transmitted will be strictly axial. Any deviation of the mirror to the right or left will result in a certain degree of obliquity in the light, which should be strictly avoided as tending to produce false effects.

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[*] By the aperture of an objective is meant its capacity for receiving rays of light, and it has been customary to measure this by the angle of the pencil of rays admitted by the lens. So long as "dry" lenses alone were considered this plan of referring to their "angular aperture" was satisfactory, but confusion was introduced when "immersion" objectives were to be compared with them. For rays which in air form an angle of 120°, when passed through water have an angle of 82° only, and in the case of cedar oil but 69°. It therefore was necessary in speaking of the aperture of an objective to state whether oil, water, or air angle was meant, whilst no direct comparison between these could be made. Professor Abbe has overcome this difficulty, however, by introducing the term "numerical aperture." This is usually indicated by the letters N. A., and is found "by multiplying the sine of half the angle of aperture in any given medium by the refractive index of that medium." Thus, an objective having the maximum angular aperture in air, 180°, would be of N. A. 1·00, and this would correspond to a "water" angle of 97° 31′, and an "oil" angle of 82° 17′. It is thus possible to refer to the apertures of all objectives in terms of their resolving power, *i.e.*, the "power of separating visibly line from line, dot from dot, mark from mark." Resolution increases with angular aperture, and is proportional to numerical aperture.

Whichever form of mirror be used gives convergent light, the rays proceeding from the mirror intersecting in any given point of the field of view and diverging thence towards the objective. The reason a concave mirror gives more intense illumination than a plane one is simply that the former receives and reflects on a given point a greater number of rays from the source of light. It is, consequently, more advantageously used for high amplifications than a plane mirror, on account of the great loss of light that occurs in passing through optical systems of high power. When working with low power objectives, however, up to about half-inch focus, a plane mirror is desirable, as by its use the field of view is not too glaringly bright, and so does not soon fatigue the eyes.

### Bull's-eye Condensing Lens.

Since to obtain uniform illumination when the light is transmitted by the mirror alone it is necessary to bring the lamp inconveniently near the microscope, a bull's-eye condensing lens is frequently used between the mirror and the flame. When this is the case the lamp may be placed about a foot distant from the microscope with the bull's-eye near it. The centre of the latter must be upon the line joining the centres of the flame and mirror, and its plane surface at right angles to this line and towards the lamp. By this means the diverging rays from the lamp are rendered parallel when the bull's-eye is placed at such a distance from the flame that an inverted image of the latter is projected upon the wall or a screen at some distance.

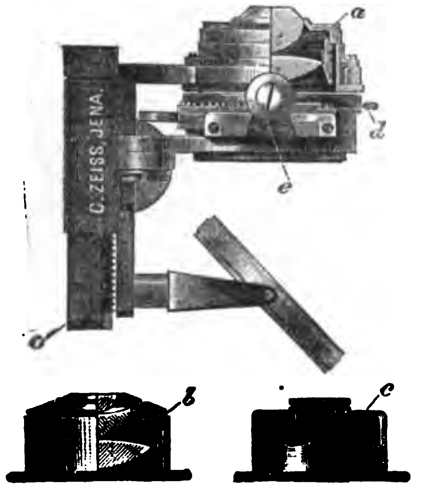

Fig. 10.—Sub-stage condenser and fitting: *a*, condenser system of N.A. 1·20; *b*, ditto of N.A. 1·40; *c*, cylinder diaphragm; *d*, iris diaphragm; *e*, milled head for throwing the diaphragm out of centre.

### Sub-stage Condenser.

But in advanced and critical work an accessory of much greater importance is the sub-stage condenser. This consists of a system of lenses placed between the mirror and the stage in a fitting known as the sub-stage (see figs. 9 and 10). It allows a bright cone to be thrown upon the object, containing a much greater number of rays than can proceed from the mirror alone. There is a great variety of condensers in use, and for very critical work it is necessary to have a separate and distinct one for each objective. But usually the condensers supplied can be divided into their elements, and so may be made to serve under varying conditions. The aperture of the condenser need not greatly exceed two-thirds that of the objective used. In the illustration (Fig. 10) the Abbe chromatic condenser, a favourite form, is represented in the special fitting made by Zeiss, but it is now adapted to all the best types of English instruments. The ordinary condenser (*a*) has a numerical aperture of 1·20 when joined to the under side of the glass slip upon which an object is mounted, by a drop of cedar oil. Used dry, its N.A. cannot, of course, exceed 1·00, and when the top lens is removed this is still further reduced, so that the condenser is suitable for use with low power objectives. A three lens form (*b*) of this condenser has an aperture of 1·40 when used as an immersion condenser.

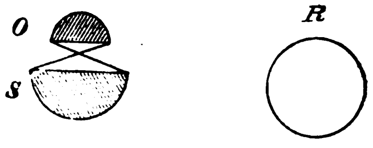

Fig. 11.—Condenser, *S*, and object glass, *O*, with the same aperture. *R*, appearance at back of objective.

It is not sufficient, however, that the total aperture of a condenser is great, since it is only the aplanatic aperture that is effective, *i.e.*, the aperture of the largest cone the condenser is capable of giving, free from spherical aberration. To ascertain this, focus an objective upon an object, then place the condenser in position above the mirror, and gradually raise it until an image of the lamp flame falls upon that of the object as viewed through the microscope. Now move the object away from the stage, also remove the eyepiece, and look down the tube at the back of the objective. If the aperture of the aplanatic illuminating cone be as great as that of the objective or greater, the back lens of the latter will be filled with light (see R, fig. 11). If the aperture of the objective be greater, however, it will be found that a point can be reached by gradually raising or lowering the condenser, at which the bright disc of light attains its greatest diameter and yet remains unbroken (see T, fig. 12). Raising the condenser further, two black spots will appear (see D, fig. 13), and the last point before these are seen indicates the greatest aplanatic aperture of the condenser.

and its limit for critical work. Judged by this test, the ordinary Abbe condenser has a comparatively small effective aperture, and the achromatic form (N.A. 1·0) by the same maker will be found preferable. It may be worth while pointing out that by having an adapter to fit them to the sub-stage, the objectives themselves may be used as achromatic condensers. Thus a Zeiss AA objective of N.A. 0·30, used as a condenser, will give a sufficiently large cone for the D of N.A. 0·65, whilst that in turn will serve for the DD or E of N.A. 0·85.

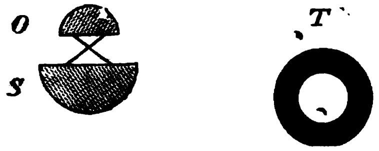

Fig. 12.—Condenser, *S*, and object glass, *O*, with aperture of former cut down. *T*, appearance at back of objective.

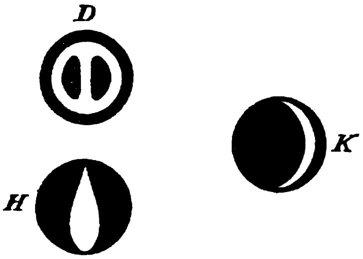

Fig. 13.—Images of lamp flame formed by bull's-eye.

### To use the Sub-stage Condenser.

Place an object on the stage, focus with a Zeiss D objective (one-sixth inch, of N.A. 0·65), then adjust the plane mirror so that the image of the edge of the lamp flame falls on the middle of the field. Then move the condenser up or down until this image is distinctly seen with the maximum of clearness. If the Abbe achromatic condenser is used, on removing the eyepiece and looking down the tube the back lens will be found filled with light (see R, fig. 11), for the aplanatic aperture of this condenser is the same as the numerical aperture of the objective, 0·65. By slightly closing the iris diaphragm the illuminated disc may be reduced to about three-fourths (see T, fig. 12), and, on replacing the eyepiece, the image of the object may be examined. It is, of course, only partially illuminated, since the image of the lamp flame will not cover it entirely, but this observation in the image of the flame allows details to be seen which are not visible with any other form of illumination. Such an image is called a critical image, and critical illumination best conduces to the revelation of intimate structure. If the light is too bright for the eyes a blue or neutral tinted glass may be interposed between the light and the mirror.

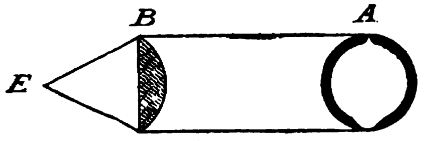

Fig. 14.—*E*, flame; *B*, bull's-eye; *A*, disc of light.

When it is desired to extend the illuminated area over the field of view the condenser may be raised or lowered slightly, but a more accurate plan is to introduce a bull's-eye lens between the lamp and the plane mirror. This is a little difficult to perform without practice, as the edge of the flame must be not only in a line with the centre of the bull's-eye but also in its exact focus (see fig. 14). Dr. Bousfield* best describes the method of procedure as follows:—Place the bull's-eye as far as possible from the lamp, upon the line joining the centre of the flame and the centre of the mirror. The image of the flame will now appear as in fig. 13, H. As the bull's-eye is then brought nearer to the flame, the band of light gradually widens into a disc, evenly illuminating the whole field (fig. 14, A). Variation to one side or other of the central line will be indicated by corresponding deformities in the shape of the band (fig. 13, K), and when the bull's-eye is too near the lamp the disc becomes uneven (fig. 13, D). It should be pointed equally above and below, and curved equally on both sides. When the even disc is obtained, move the condenser somewhat nearer the object, until the amount of light in the field attains its maximum. The condenser is then in focus again, and above or below the focal point the light diminishes rapidly.

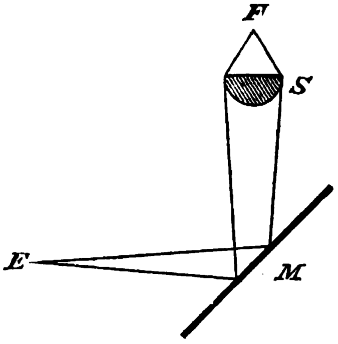

Fig. 15.—Method of getting a critical image. *E*, flame; *M*, mirror; *S*, condenser; *F*, object.

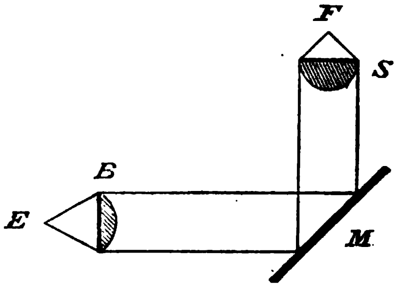

Fig. 16.—Method of getting a critical image when bull's-eye is used. *E*, flame; *B*, bull's-eye; *M*, mirror; *S*, condenser; *F*, object.

### Immersion Objectives.

An oil immersion objective of about one-twelfth inch focus is a necessity in bacteriological work.

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* 'Guide to the Science of Photo-Micrography,' 1892.

One of about N.A. 1·25 can now be purchased for a comparatively moderate sum but, if expense be no object, a higher aperture is preferable. Water immersion objectives are neither so convenient nor so satisfactory in use. The great value of cedar oil as an immersion fluid for objectives is due to the fact that, as prepared for this purpose, its refractive index is practically identical with that of the glass of the front lens and the cover-glasses of slides. Light rays pass through the oil into the front lens without undergoing refraction, and objectives specially made for use in this manner are spoken of as homogeneous immersion systems. They collect more light rays, in proportion, than either a dry lens or a water immersion, and have a greater working distance for the same magnifying power, *i.e.*, the front lens is at a greater distance from the cover-glass. In use, a drop of cedar oil is placed on the cover-glass, the microscope body racked down until the front lens touches the fluid, then, whilst the observer is looking into the instrument, the body is gradually raised again by means of the fine adjustment until the exact focus is attained. The oil must be carefully removed from the lens before it is put away. A piece of filter paper will absorb the bulk of the oil, and the remainder may be quite removed by means of a soft handkerchief moistened with a drop of benzol.

## PRACTICAL WORK.

Having properly arranged the microscope, condenser, and lamp as described above, take a mounted specimen of unstained bacteria, approximately focus with a one-sixth inch objective, using first the full cone of light from the condenser and then gradually closing the iris diaphragm. If observation be continued all the time it will be found that the micro-organisms are at first almost or quite invisible, being, as it were, drowned in the flood of light. As the exterior rays are cut off by the diaphragm, however, the bacteria become more distinctly visible but, at the same time, the diminution in the intensity of the light prevents anything like a satisfactory examination. Repeat the experiment with the same object, but using the immersion objective. The results will be practically the same, except for the greater magnification obtained.

Next, examine a similar specimen stained with gentian violet, with the one-sixth inch objective. The bacteria will be easily distinguished, with a full or three-fourths cone of light, but nothing beyond the external shape of the organisms can be determined. With the one-twelfth inch homogeneous immersion lens, however, and a three-fourths cone, the greater amplification will enable details such as the limiting membrane to be clearly distinguished. A great deal of practice in preparing and examining specimens will be required ere much in the way of internal structure can be distinguished, but there will be no great difficulty in identifying and classifying the commoner forms of micro-organisms when thus examined. The full aperture of the cone from the condenser will only be needed when bacteria in stained tissues are dealt with. In such a case the excess of light obliterates the tissue elements whilst leaving the deeply stained bacteria in the field of view.

The same specimens should be examined with each of the different methods of illumination, in the following order:—Plane mirror alone; concave mirror alone; the same with bull's-eye interposed between them and lamp flame; then, condenser and plane mirror; and, finally, condenser, plane mirror, and bull's-eye. In this manner the respective values of all the methods can be ascertained, and facility gained in the use of the different accessories.

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## OILS OF ANISE.

### BY P. W. SQUIRE, F.L.S.

As supplementary to the paper read by Mr. John C. Umney (*Ph. J.*, [3], xix., 647), and the ensuing discussion, the following rough notes, arising out of some experiments in connection with a new edition of the 'Companion to the B.P.,' may help towards a more accurate knowledge of these oils.

It may be premised that the oil of ordinary anise (*Pimpinella Anisum*) and of star anise (*Illicium anisatum*), when freshly distilled, consist mainly of anethol, a stearopten melting at 70° F., with varying quantities of a terpene. By exposure to air, anethol is gradually converted into anisic aldehyde, with probably some resinification of the terpene, this oxidation being accompanied by certain changes in the physical characters of the oil.

### *Congelation.*

In connection with the solidification and liquefaction of anise oil, there are *three* temperatures to be noted:—

A. "Abnormal solidifying point," or the temperature at which the oil when cooled first shows indication of freezing. This depends so completely upon the conditions of cooling that no figure can be attached to it. Two experiments with the same sample may show a difference of over 20° F., this being true of either variety of oil.

B. "Normal solidifying point." This is defined by Mr. Umney as "the temperature to which the thermometer immediately rises on solidification taking place." For two reasons this point is somewhat indefinite: (1) the rise of temperature is more or less gradual, and although much more rapid at first than at the finish, the thermometer is never steady at any one point, and the more solid the frozen mass, the slower the rise in the thermometer; (2) the point to which the temperature rises *rapidly* depends to some extent upon how far the oil has previously been cooled. Supposing one considers the normal solidifying point to be reached, when the rise of temperature is only one degree in half a minute, a difference of 20° in the *abnormal* may make a difference of 3° to 6° in the *normal* solidifying point.

C. "Melting point." The temperature at which a sample after freezing becomes completely liquid is the only *constant* factor in connection with the congelation and liquefaction of anise oils. It is a few degrees higher than the normal solidifying point, and in recent samples may vary from 60° to 68° F.

It must be noted, however, that the congealing point, in whatever way taken, is not of much value either as a character or test, except for a fresh oil, as it becomes lower on keeping at a rate differing in each sample. I have had specimens the melting point of which after two years had only been reduced 5° to 7° F., while others (both from ordinary and star anise), after a similar interval, and kept under roughly similar conditions, could not be made to freeze at 10° F. Whether these differences are due to the larger proportion of the anise terpene accelerating the oxidation of the anethol I have not yet determined experimentally.

### *Specific Gravity.*

This depends (1) on the proportion of terpene to anethol. Supposing melted anethol to have a sp. gr. at 60° F. of 1·010 and the terpene ·870, then 10, 20, and 25 per cent. of terpene will give specific gravities of ·996, ·982, and ·975 respectively, which covers the maximum and minimum of fresh oils as generally met with; (2) on the oxidation of the anethol into anisic aldehyde, the published sp. gr. of which is 1·100. Of the oils examined, the highest specific gravity which we have noted is 1·105, being the last few ounces of a bottle of English-distilled oil from ordinary anise, so that according to the age of the oil we may have any sp. gr. between ·975 and 1·100.

### *Rotation.*

The polarising rotation of anise oils in a 200 mm. tube has in the samples examined varied between +2⅓° and −4⅓°. It is usually a small minus quantity; appears to have no connection with the source of the oil; does not alter in a year; and is greater in the more liquid portion of the oil than in the solid. Pure anethol has probably no rotation whatever.

### *Solubility.*

Anethol requires for solution three parts of rectified spirit and 200 parts of proof spirit. As oxidation proceeds, the solubility increases, till the oil mixes with rectified spirit in all proportions and dissolves in about 100 parts of proof spirit. Star anise oil, however, appears to contain a small quantity of some constituent insoluble in proof spirit, as even after warming the solution is slightly turbid.

### *Eykmann's Test.*

This is understood by Mr. Umney (*Ph. J.*, [3], xix., 649) to be "a saturated solution of hydrochloric acid gas in absolute alcohol," and is stated by him to give with "pimpinella" oil a manganese-pink colour, and with star anise oil a yellowish-brown colour.

In the 1890 edition of the 'Companion,' however, we mentioned that this test did not appear to be very definite, as "of five samples tested, three (pimpinella) gave a blue colour; one (illicium) gave a pink; one (illicium) gave a yellow colour," while the result of more recent experiments confirms the observation that with "pimpinella" oil the colour given is a rich blue, changing into a more or less brownish-red. Star anise oils give a yellow or brownish-yellow colour, usually, but not always, changing to a rich red. The test therefore depends not upon the difference between a pink and a yellowish-brown colour, but upon the production or non-production of a deep blue colour on addition of the reagent, which is best used in considerable excess. I would venture to suggest that the different results obtained by Mr. Umney were due to the use of an alcohol not sufficiently saturated with hydrochloric acid. The reagent used above had a sp. gr. of ·970 and contained 27 per cent. by weight of hydrochloric acid gas. With an acid of half that strength, the characteristic blue colour is not produced.

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## THE CAUSE OF MILDEW OR RUST.*

*(Concluded from page 67.)*

### PREDISPOSITION.

A certain predisposition of the host plants of parasitic fungi, or of many of them, is generally recognised. In some cases an unhealthy state of a plant may make it liable to receive injury, and this unhealthy state may be caused by its environment, such as influences of weather, situation, soil, cultivation, nitrogenous manurings, changes of temperature, excess or lack of water, and by conditions causing chemical changes in the cellular system of the plant. De Bary says, "The physiological reasons for these predispositions cannot, in most cases, be exactly stated; but it may be said in general terms to lie in the material composition of the host, and therefore to be indirectly dependent on the nature of the food. In the case of the Pythieæ, for example, it is easy to see that the host displays degrees of susceptibility or power of resistance in presence of the parasite proportioned to the amount of water which it contains."†

Mr. Marshall Ward also deals ably with this subject, and shows that the host plants of fungi are more or less predisposed to receive injury according to the limits of their health.‡ After describing certain chemical and structural changes produced by weather and other influences, Mr. Marshall Ward concludes that "under certain circumstances the parenchymatous tissues of the living plant may be in a peculiarly tender, watery condition where the cell walls are thinner and softer, the protoplasm is more permeable and less resistant, and the cell sap contains a larger proportion of organic acids, glucose, and soluble nitrogenous materials than usual. When the external conditions become more favourable—the temperature higher, the air drier, and the sunlight more powerful—increased transpiration and respiration lead to more normal metabolic activity, for which energetic assimilation provides the materials. Of course, all kinds of combinations are possible in detail, but when dull, cold, wet weather prevails for some time, after a period of bright, hot, and dry weather, we are apt to have herbaceous plants in such a condition as that described.§

This would seem to explain why in some seasons the epidemic of wheat mildew is prevalent, and in some seasons absent, and is confirmed in a most practical manner by the statements of many of the agriculturists who answered the questions contained in a schedule, as to the coincidence of the attack with the abnormal white frosts and the frequent and great changes of temperature during the last summer.

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* From a Report to the Board of Agriculture, 1892.

† De Bary. *Op. cit.*

‡ Sorauer also holds that predisposition depends upon the limit of health—"Breite der Gesundheit"—in his work, 'Die Schäden der einheimischen Kulturpflanzen,' 1888.

§ Croonian Lecture, "On Some Relations between Host and Parasite in Certain Epidemic Diseases of Plants," by H. Marshall Ward, F.R.S. 'Proceedings of the Royal Society,' 1890.

Moisture is necessary for the germination of the spores. It has been considered that the moisture from the transpiration of the plants is sufficient for their germination, at all events if it is abnormal, or increased by unhealthy conditions. The entrance of the germ-tube into the stomata of the wheat-leaf is easily accomplished in normal circumstances, and is rendered easier if the stomata are relaxed by influences unfavourable to the health of the plant. Then, having gained an entrance, it would appear to be dependent upon the nature of the food within its reach in the cells of the wheat-plant, as to whether it forms mycelium and continues its actively destructive work in transporting the products of assimilation from the host to itself, as Sachs puts it.*

This is the usual action of what are known as "obligate" parasites, or those which the host plant serves directly to support, and it is the action of the wheat mildew fungus, at least, in its stages upon corn and grasses. In its other, or æcidium, stage this action is modified, as the fungus appears then to lose some of its obligate characteristics.

This entire dependence of the fungus upon the wheat plant naturally tends to injure it in proportion to the quantity of the parasite upon it, if there is a continuance of conditions favourable to the one and unfavourable to the host. The direct injury is generally to the straw, which it blackens, disintegrates, and spoils for every purpose but that of rough litter. Then in bad attacks the number of grains are lessened in the ears. There are empty awns, and some of the grains are much shrivelled, having lost weight, shape, quality, and colour. In less severe attacks there is a percentage of grains more or less shrivelled and distorted, which serves to spoil the appearance of the sample.

## SPRING-RUST AND MILDEW.

*Puccinia rubigo vera.*

There is much confusion, and most naturally, among cultivators in all countries where cereals are grown, concerning the two kinds of rusts which attack these crops, especially wheat and oats. It will be useful, therefore, having fully described the summer-rust and mildew, *Uredo linearis*, and its forms of *Puccinia graminis* and *Æcidium berberidis*, to give a detailed account also of the spring-rust, *Uredo rubigo vera*, and its mildew forms of *Puccinia rubigo vera*.

The differences between these two rusts and mildews are sharp and clear, and when once noted they will be easily remembered. In the first place, the spring-rust (*Uredo rubigo vera*) often appears as early as March, much earlier than the summer-rust (*Uredo linearis*). The colour of the spring-rust is more yellow and not so red, or orange-coloured, as that of summer-rust. Its sori, or blotches, upon the blades are not quite so large nor so long, being more round in shape. By comparing the figures of a spring-rust sorus, and a section of a sorus highly magnified, and of the spore germinating with those illustrating *Puccina graminis*, in its uredo stage, a marked distinction will be noticed.

The sori of *Puccinia rubigo vera* are full of spores of a yellow colour, somewhat oval in shape. These spores are constantly discharged in immense quantities upon the plants near them, and carried by the wind in all directions upon corn plants and grasses. They germinate upon suitable hosts by putting forth germ tubes. These enter the stomata of the leaves and form new sori, so that there is a continual succession of these uredo spores until autumn approaches, and the corn plants begin to ripen. A change then takes place; the reddish-yellow spots become dark-coloured, just as in the case of *Puccinia graminis*, and the uredo form is gradually merged into the Puccinia or teleutospore form. The sori of the teleutospores are considerably smaller than those of *Puccinia graminis*, and of a rather lighter colour. The spores from these sori are also smaller and rather differently shaped, and enveloped in coverings, paraphyses. In these states they are actively injurious to the corn plants. Though it has been said that the injury caused by spring-rust and mildew is inconsiderable, this is by no means borne out by facts. Corn plants badly infected by it have been carefully watched, and have been found to yield poor crops of more or less shrivelled grains. In some cases where wheat has been much covered with the blotches of the fungus, the plant appeared to be quite checked in its growth.

With respect to the hibernation of this fungus, *Puccinia rubigo vera*, there is some doubt. De Bary has proved that the teleutospores will germinate readily, and form Æcidia upon some species of the *Boraginaceæ*, as *Borago officinalis*, common borage, *Anchusa officinalis*, common alkanet, and other species in the autumn, in this respect differing from those of *Puccinia graminis*, which will not germinate until the spring. De Bary first proved this, and termed this form *Æcidium asperifolii*. He also found that the spores from this Æcidium form germinate upon grasses and corn plants in the same way as the spores from *Æcidium berberidis*.* But De Bary shows that the spring-rust is reproduced year after year in frightful quantities by the uredo spores only. These produce also millions of teleutospores which germinate, but without result, because the sporidæ seldom meet with the conditions necessary for developing æcidia. These certainly are developed if the conditions are favourable; but the instance shows that the species can multiply abundantly without the interposition of æcidia.†

The fungus causing spring rust and mildew is continued through the winter in the uredo form upon grasses and self-sown corn plants, and probably upon winter wheat and winter barley. Frank, confirming De Bary's statement as to the fungus passing the winter in the uredo form upon self-sown corn plants and grasses, says that it is most desirable to eradicate wild grasses from the neighbourhood of corn fields, and especially *Bromus mollis*, soft brome grass. He also advises that all weeds of species of *Boragineæ* should be rooted up.*

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* A Text-book on Botany,' by Julius Sachs.

* 'Monatsbericht der Akademie der Wissenschaften, zu Berlin,' 1866.

† 'Comparative Morphology and Biology of the Fungi, Mycetozoa and Bacteria,' by A. De Bary, 1884.

*Puccinia rubigo vera* is most common in India. Mr. Barclay remarks that "*P. rubigo* appears to be the most prevalent rust in the Simla region." † The natives of India recognise the distinction between *Puccinia rubigo vera* and *Puccinia graminis*. They call the first "Rolli," and the other "Rolla."

In America, *Puccinia rubigo vera* is also quite common, according to Mr. Galloway, Chief of the Section of Vegetable Pathology of the United States Department of Agriculture.

In Australasia it is extraordinarily abundant. At the Rust Conference in New South Wales, before alluded to, Dr. Cobb said, "as far as the experiments of last season (1890) went there could not be the least doubt that nearly all the damage was caused by spring-rust, *Puccinia rubigo vera*." Dr. Cobb further said, "during the past two years it has been proved that *Puccinia rubigo vera* exists in the uredo stage all the year round in Australia, either on self-sown wheats, oats, barley, etc., or on certain grasses," and further on he remarks "there can be no excuse for permitting rust to pass the winter on cereals, self-sown through careless farming, or on weeds."

## SIAM BENZOIN.

T. Lüdy finds that by treatment with ether, Siam benzoin, like Sumatra benzoin, is almost completely dissolved, the residue amounting to only 1·6 per cent. On shaking the ether solution with dilute alkali solution it suddenly solidified to a gelatinous mass of crystals, from which the ether could not be separated. Upon adding some alcohol, crystals of a potassium salt of benzoresinol were deposited after some hours. By using a very dilute alkaline solution and leaving it for some time in contact with the ether solution of benzoin, without shaking, a sharp separation of the two liquids was effected. The dark coloured watery liquid was drawn off and the ether solution repeatedly washed with very dilute caustic alkali. By treatment of this ether solution with sodium sulphite no evidence of the presence of aldehydes was obtained. On distilling off the ether a yellowish thick liquid of very aromatic odour remained, amounting to about 0·3 per cent. of the benzoin, and probably consisting of a benzoic ester, the alcoholic constituent of which was not ascertained. In this way it was found that styrol, benzaldehyd, benzene, styracin, and phenyl propyl cinnamic ester, which are constituents of Sumatra benzoin, are not present in Siam benzoin. The alkaline liquor contained benzoic acid, vanillin amounting to 0·15 per cent. of the benzoin, and a resinous substance which gave no benzaldehyde when warmed with permanganate, but resembled the product obtained from Sumatra benzoin (*Ph. J.*, [3], xxii., 886). This was found to consist of benzoresinol and—siaresinotannol—a substance analogous to resinotannol. Benzoresinol, $C_{16}H_{26}O_2$, from Siam benzoin is a white amorphous substance, without taste or odour, melting at 272°, and presenting characters which show that it is identical with the product from Sumatra benzoin Siaresinotannol, $C_{12}H_{14}O_3$, is also an alcohol having the form of a brown powder free from taste or smell, differing in composition from resinotannol of Sumatra benzoin, but analogous to it in most of its characters. The general result of these observations is that both Sumatra and Siam benzoin consist chiefly of mixtures of benzoic esters of resinoid alcohols, together with 1·6 per cent. free benzoic acid and some vanillin. —*Archiv der Pharmacie*, 231, 461–480.

## OLIGODYNAMIC PHENOMENA OF LIVING CELLS.

A very remarkable paper, bearing the above title, is published in the *Denkschrift* of the *Schweizerische naturforschende Gesellschaft* by the late Professor Carl v. Nägeli, edited by Professor Schwendener and Professor Cramer. Professor Nägeli found that certain algæ—*Spirogyra nitida* and *dubia* were those experimented on—were rapidly killed if the water in which they grow was brought into contact with copper, as for example with a gold coin containing 10 per cent. of copper. The poisoning action may commence in as short a period as from three to six minutes, and he satisfied himself that it was due to the solution of excessively small quantities of copper, which is taken up in the form of $CuH_2O_2$ in combination with $CO_2$. The same result is produced by other metals, such as lead, tin, and mercury, while the absolutely insoluble metals, gold and platinum, are without effect. It is stated that 1 part of copper dissolved in 1000 million parts of water may act pathogenically on *Spirogyra*; and it is to this action of infinitesimally small quantities of metals in solution that Nägeli applies the term "oligodynamic." One very remarkable observation is that the poisonous property is imparted to a glass vessel in which a copper coin has been laid. Water which has been distilled in a copper vessel will kill *Spirogyra* very rapidly. On the other hand the pathogenic effects of the poisoned water may be diminished or altogether neutralised by placing in it lumps of solid insoluble substances, such as wood, coke, cotton, silk, etc., which present a large surface on which the metal is precipitated. For the same reason water which will rapidly kill a few filaments of *Spirogyra* is without effect on a larger quantity.

The poisoning resulting from these oligodynamic properties manifests itself in a different way from ordinary chemical poisoning. The cell retains for a time its turgidity; the protoplasm remains adherent to the cell-wall, while the spiral band of chlorophyll detaches itself, and collects into a solid mass surrounding the cell-nucleus; and the substance of the band swells up, presenting, on transverse section, a cylindrical or oval outline.

The most important of Professor Nägeli's results have been repeated and confirmed by Professor Cramer.

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* 'Die Krankheiten der Pflanzen.' Von Dr. A. B. Frank.

† 'Rust and Mildew in India.' By the late A. Barclay, M.B., F.L.S.

## DRAGON'S BLOOD.

BY PROFESSOR FLÜCKIGER.

In an article in the *Pharmaceutical Journal* of July 15, p. 47, Monardes is quoted as the first author who mentioned American dragon's blood. In his 'Primera y segunda y tercera partes de la Historia medicinal de las cosas que se traen de nuestras Indias Occidentales que sirven en Medicina,' Sevilla, 1574, page 78, the figure "El dràgon" shows three pods of a tree from which the drug was collected in the time of Monardes, in the country of Carthagena. One of the pods is open, and exhibits the outlines of an animal of the fabulous kind of a dragon, just as described in the said paper in the words of Gerard's 'Herbal.'

The question to be solved is, says the author of the paper inserted in the *Pharmaceutical Journal* (from *Gardeners' Chronicle*), what was the fruit mentioned by Monardes, which contained so striking a verisimilitude to a dragon?

The figures in Monardes are so extremely crude that they cannot afford any idea of the plant to which they belong. Still, they may be allowed to represent the pods of some species of the leguminous order.

Dragon's blood was certainly never an important article of commerce in Europe, and that from Carthagena probably made its appearance in the market but very irregularly, and has completely disappeared long ago. It was, however, to be met with at that time; thus we find it plainly described by one of the most competent pharmacologists of the middle of our century. Theodore W. C. Martius (see Hanbury's 'Science Papers,' p. 7 and 25), Professor of Materia Medica in the Bavarian University of Erlangen (+1863), enumerates three varieties of dragon's blood in his 'Grundriss der Pharmakognosie,' Erlangen, 1842, p. 366 to 369, viz., that from Calamus, that from Dracæna (see 'Pharmacographia,' 2nd edition, p. 672 to 676), and, thirdly, that from Carthagena, the source of which, according to Martius, is *Pterocarpus Draco*, L. This tree having been named by Linné, the knowledge of its product must have induced Linné to bestow on it the specific name of Draco. *Pterocarpus Draco*, indeed, is pointed out as the mother plant of the drug under notice as early as A.D. 1749, in the first edition of 'Caroli Linnæi Materia Medica,' Liber I., De Plantis, p. 184, No. 522. It is true that Java and India orientalis were erroneously stated by Linné to be the native countries of the tree.

The description of the resin, as given by Martius, is so accurate that we may feel quite sure he had it before him. Whether he had actually the opportunity of ascertaining its botanical origin must remain unsettled. But Lindley already, in his 'Flora Medica,' 1838, p. 257, mentioned *Pterocarpus Draco* as yielding the red juice from the wounded stems; he also quoted a statement of Jacquin's to the effect that large quantities of that dragon's blood had once been exported from Carthagena to Spain. When Jacquin paid a visit to Carthagena, between 1754 and 1759, he found the commerce in dragon's blood had almost ceased. In his 'Enumeratio systematica plantarum quas in insulis Caribæis vicinaque Americæ continente novas detexit, etc.,' Lugduni Bat., 1760, t. 183, N. I. von Jacquin figured the tree under the name of *Pterocarpus officinalis*, whereas in Hayne's 'Darstellung und Beschreibung der in der Arzneikunde gebräushlishen Gewächte,' t. IX., pl. 9, the name of *Pterocarpus Draco*, Hayne, was applied to the tree which is now known as *Pterocarpus suberosus*, DC.; it is a native of Guiana.

Guibourt was also acquainted with the dragon's blood from the West Indian Islands, which he ('Histoire naturelle des Drogues simples,' II., 1869, 139, and III., 346) attributed to Linné's *Pterocarpus Draco*; he says the resin was very rarely to be met with.

It would appear, therefore, that we may unhesitatingly regard that tree as the source of the dragon's blood discovered near Carthagena by the Spanish invaders. Its corky, indehiscent pod of nearly orbicular outline tolerably answers to the figures of Monardes, and the solitary, kidney-shaped seed, if duly shrivelled, may remind, in the eyes of a fantastic observer, of what he supposes to be a dragon.

In India, *Pterocarpus Marsupium*, Roxb., affords the exudation called kino, which is but little used now. It would be desirable to investigate the chemical composition of the dragon's blood of the *Pterocarpus Draco*, and to examine whether it does or does not agree with the kino of the nearly allied species, *P. Marsupium*, of Malabar. On applying to Jamaica, the material for such an investigation would probably be obtainable. It would be desirable to know whether two trees so closely allied, like the two species of *Pterocarpus* just mentioned, could yield products so widely different as are kino on the one side and true dragon's blood on the other. In the careful monograph of dragon's blood by Lojander, 'Beiträge zur Kenntris der Drachenblutes,' Strassburg, 1887, the author only mentioned briefly the drug of *Pterocarpus Draco*, which he had not at his command.

We may anticipate that it rather belongs to the numerous class of kinos, the exudations of several species of eucalyptus, as well as of *Pterocarpus Marsupium* and other trees. Whether they are chemically identical or not remains to be studied.

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## DISTRIBUTION OF MANNITE AND DULCITE IN PLANTS.

According to Herr A. N. Monteverde, the presence of these substances in the tissues is especially characteristic of the natural order Scrophulariaceæ. Out of 797 species examined, belonging to 109 genera of this order, mannite was found in 272 species belonging to thirty-six genera, dulcite in twenty-six species belonging to four genera. They were never both found in the same species, and only in two instances in the same genus. Mannite was found, in addition, in a few species of Orobanchaceæ, in the Jasminieæ, and in *Apium graveolens* and *Petroselinum sativum*, belonging to the Umbelliferæ. Dulcite occurred also in several species of Celastraceæ. In *Rhinanthus*, *Euphrasia*, and *Melampyrum* the author states that mannite and dulcite are certainly plastic substances resulting from the transformation of sugar (*Ueber die Verbreitung des Mannits und Dulcits*, 1893, 37 pp.).

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, AUGUST 5, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the meeting last Wednesday, the additions to the Society comprised fifteen pharmaceutical chemist members, two chemist and druggist members, fifty-three associates, and twenty-one students. Several persons were restored to their former position in the Society.

The report and recommendations of the Finance Committee did not present any specially noticeable feature. Two subscriptions to the Orphan Fund had been received.

On the recommendation of the Benevolent Fund Committee two grants of ten pounds each were ordered to be paid, and the Vice-President, in mentioning that the nomination of Mrs. Downes' daughter as a candidate for election to the St. Anne's Asylum would shortly take place, expressed the hope that the case would be supported by any members who might have votes or influence.

The report of the Library, etc., Committee, in addition to giving the usual statistics, recommended the preparation of a new edition of the Library catalogue; that the Librarian should be requested to attend the meeting of the Library Association at Aberdeen in September; and that the Society's Museum should be affiliated to the Museums Association. These recommendations were adopted, as well as a suggested modification of the conditions under which the herbarium prize is offered, by which collections made in the Channel Islands or in the Isle of Man will be admissible in the competition. It was decided that the inaugural meeting of the coming session shall take place on Monday, the 2nd of October next, at 3 o'clock in the afternoon, and, on that occasion, the address will be delivered by Dr. Lauder Brunton.

An important item in the report of this Committee was the recommendation that the plans for the proposed additional buildings at the Society's house in Edinburgh, and the estimates for their erection, fitting, and furnishing, should be approved by the Council. The plans for these new buildings have been prepared with great care by the Executive of the North British Branch of the Society, and the desirability of making suitable provision for carrying out the examinations in Scotland has been fully recognised by the Council. This feeling was expressed in the discussion that took place after the President had moved the adoption of the scheme and its remission to the Executive to carry out, and it was unanimously agreed to.

Consequent upon the receipt of a letter from Mr. H. G. Greenish, stating his willingness to accept the Professorship of Materia Medica on the terms proposed, the appointment was made for the ensuing session.

The examiners appointed to conduct the examinations for the Jacob Bell Memorial Scholarships reported that thirty-three candidates had competed for these scholarships at the different centres, and that the candidates to whom the scholarships have been awarded are Mr. Thomas Anderson Henry, of Sevenoaks, and Mr Charles Edmund Ashby, of Worcester.

The President reported to the Council that at a meeting of the adjudicators of the Hanbury medal it was decided to award the medal to Professor Maisch, of Philadelphia, and he suggested that as he is going as a delegate to the International Pharmaceutical Congress at Chicago he should be authorised to take the medal and ask the president of the Congress to present it to Professor Maisch on the occasion of that meeting, which was agreed to.

Mr. A. J. Phillips was appointed divisional secretary for South Kensington, in the place of Mr. Bowles, who has been compelled to resign the position in consequence of ill-health.

The report of the General Purposes Committee included the reports on the several prize examinations, giving the names of the successful candidates, which will be found at page 115. The Pereira medal has been awarded to Mr. Thomas Tickle, the Society's silver medal has been awarded to Miss Annie Elizabeth Tilson, and the bronze medal to Mr. Francis Rose.

In connection with the Manchester Pharmaceutical Association Scholarship it was recommended that a sum of fifty pounds from the accumulated interest should be awarded to Mr. H. A. D. Jowett to enable him to work for an additional year in the Research Laboratory. This arose from the circumstance pointed out by the President that there have not been any competitors for the scholarship endowed in especial connection with the Manchester district, and the suggestion has been made to the founder of the scholarship that a portion of the money in hand should be applied in the manner above mentioned. This has been acquiesced in, and the recommendation has now been adopted by the Council. The Redwood Scholarship has been awarded to Mr. Thomas Tickle, and he will thus have the privilege of working in the Research Laboratory. But as the other five candidates for the Redwood Scholarship desired to work in that Laboratory, it was recommended that an additional grant of fifty pounds should be made by the Research Committee to meet the attendant expenses, and this was also approved by the Council. Mention was also made of a very beautiful collection of plants presented to the Society by Mr. Perrèdes, which would have gained the Herbarium Prize if it had come within the terms of the conditions, and it was decided to send Mr. Perrèdes a letter of thanks for his donation.

The legal portion of the report of the General Purposes Committee stated that an appeal had been entered in the case of Delve of Manchester. Particulars were given of the payment of penalties by various defendants. Several cases are still standing for trial, and directions were given to institute proceedings in a large number of cases of alleged infringement of the Pharmacy Acts.

In drawing attention to the resignation of Mr. T. P. Blunt as an examiner, the President spoke in high terms of the services he has rendered in that capacity, and a resolution was passed by the Council expressing its appreciation thereof.

A memorial from the Nottingham and Notts Chemists' Association, relating to the Medicine Stamp Act, was read, and referred to the General Purposes Committee for further consideration.

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The absence of Mr. C. B. Allen, of Kilburn, from the Council meeting this week was due to the great loss he has sustained in the death of his wife. The sad event occurred on Wednesday, and the deepest sympathy will be felt by all Mr. Allen's friends and acquaintances at his severe bereavement.

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### SHEFFIELD SCHOOL OF PHARMACY.

We learn from the Hon. Secretary of the Sheffield Pharmaceutical and Chemical Society that the inaugural address to the students of the above school will be delivered in October next by John Harrison, Esq., J.P., of Sunderland, Member of Council of the Pharmaceutical Society of Great Britain.

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### WHAT IS SODA WATER?

Referring to the recent prosecution of a chemist and druggist by the Camberwell Vestry, for the sale of soda water alleged to be deficient in strength, *Sala's Journal* comments upon the fact that, though the defendant was successful, he was not awarded the costs he had been compelled to incur. The magistrate refused costs on the ground that the Vestry had only performed a public duty, but it is urged that costs ought to follow results in cases of this character. "A public body may be only endeavouring to do its duty, but there is the other side of the picture—the struggling tradesman incurring heavy expenses in order to preserve his good name and disprove the accusation brought against him." It might have been added that the case was brought against him unwarrantably, for, as we pointed out last week (see p. 93), there is no ground whatever for assuming that the authority of the British Pharmacopœia extends to dietetic articles or controls their composition. It is simply an authoritative guide as regards drugs and their medicinal compounds when these are prescribed by a physician. Other important features of the case were the positions taken by the public analyst and the inspector, respectively. The former, as we understand, practically instigated the prosecution by stating in his certificate that the water contained but a grain and a half of sodium bicarbonate, whereas it should have contained thirty grains, to the pint. Now the strict duty of a public analyst requires only that he should state the results of his analysis, and it should be regarded as a distinct breach of professional decorum to go beyond this and suggest, ever so indirectly, that the seller of an article should be prosecuted. The too common spectacle, nowadays, of public analysts attempting to assume a sort of dictatorship needs to be checked, or the resulting condition of things may become unbearable to even the most straightforward of tradesmen. Above all, public analysts must be taught that the proper performance of their duties does not of necessity require them to attempt to usurp for the British Pharmacopœia the position of a universal standard of quality. This lesson should be learned, too, by the inspector whose opinion, judging from his evidence, is that a chemist and druggist must sell nothing except it be of the B.P. standard of quality, though any other tradesman may exercise his discretion and supply what he thinks fit. The absurdity of this position is too obvious to require any comment, save that chemists and druggists will do well to strenuously resist all such attempts to limit their rightful liberty of action.

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### BRITISH PHARMACEUTICAL CONFERENCE.

The final arrangements for the Nottingham meeting are now completed, and are as follows:—On Monday, August 14, members of the local executive committee will be in attendance at the Exchange Hall, from 2.30 to 5.30 p.m., to answer any inquiries. At 8 p.m. the reception by the President (Mr. Octavius Corder) and conversazione will be held at the Castle Museum and Art Gallery. On Tuesday, at 10 a.m., the members of the Conference will be officially welcomed by the Mayor of Nottingham, Mr. Councillor A. Brownsword, in the Borough Council Chamber, Exchange Hall, after which the presidential address will be delivered and the sessions of Conference commenced. Luncheon will be served at the George Hotel at 1 p.m., and sessions of Conference resumed an hour later. At four o'clock a special train will leave the Great Northern railway station for the excursion to Belvoir Castle. After tea at the Peacock Hotel, Belvoir, the Castle will be visited, and the return train will leave Redmile at 8.30 p.m. The sessions of Conference on Wednesday will last from 10 a.m. to 4 p.m., with the usual interval for luncheon. At 4.30 p.m. the visitors will drive to Wollaton Hall, where tea will be provided on the lawn. Returning to Nottingham about seven o'clock, the smoking concert will be held at the Exchange at half-past eight. On Thursday, an express train will leave the Midland station, Nottingham, at 9 a.m., and, on arriving at Mansfield, carriages will be waiting to convey the visitors to Welbeck Abbey, where luncheon will be served at half-past one. The subsequent drive through Sherwood Forest will be followed by tea at the Town Hall, Mansfield, kindly provided by the Mayor, Mr. Alderman Douglas J. Patterson, and at half-past eight the return train will leave Mansfield for Nottingham.

### THE ROTHAMSTED JUBILEE.

A distinguished company, including representatives of the most prominent scientific societies, assembled at Harpenden, Herts, on Saturday, July 29, to do honour to Sir John B. Lawes and Dr. Gilbert, on their completion of fifty years of joint labour. The Right Hon. Herbert Gardner, M.P., the Minister for Agriculture, presided and formally dedicated a granite memorial in front of the famous laboratory on Harpenden Common. All the speakers, including the Dukes of Westminster and Devonshire, and Professors Michael Foster, Armstrong, Stuart, and Kinch, bore testimony to the benefit agriculture has received from the experiments conducted by the veteran scientists. Addresses were presented from the Royal Agricultural Society, Royal Society, Chemical Society, Linnean Society, Agricultural College of Cirencester, and the Société Nationale d'Agriculture de France. On behalf of the subscribers to the Rothamsted Jubilee Fund, the Duke of Westminster presented to Sir John Lawes his portrait, painted by Mr. H. Herkomer, R.A., and to Dr. Gilbert a handsome silver salver. It will be remembered that a summary of the work done at Rothamsted during the fifty years appeared in this Journal on April 8 last, and further interesting information on the subject will be found in *Nature* for July 27.

### "TERPENELESS" PEPPERMINT OIL.

Dr. Lupin, of Dorpat, in a dissertation recently published, deals with the effect of "terpeneless" peppermint oil upon the nervous system and the circulatory organs. He points out that the action of such oil, as prepared for him by Mr. Heinrich Haensel, indicates that the original oil contains something besides the known stearoptens and elæoptens. This substance, which has not yet been isolated, according to experiments, communicates to the "terpeneless" oil a paralysing action upon the nervous system, and it is considered that the chemical nature of essential oils is much more complicated and diverse than is yet recognised generally.

### BACTERIOLOGY AND DISEASE.

The *British Medical Journal* records the fact that the Board of Health of the city of New York has announced its readiness to make a bacteriological examination in all doubtful cases of throat disorder in which diphtheria is suspected. Culture tubes will be kept at certain specified places in the city, and practitioners may either obtain and inoculate these themselves or obtain the assistance of an officer of the Board. The tubes will be collected daily and a report issued in twenty-four hours. In the same number (July 29) our contemporary devotes a leading article to a detailed account of the modern method by which the specific nature of choleraic discharges can be determined. This will be found useful for reference by pharmacists who may be called upon by medical men to assist them in examining supposed cholera discharges.

### PHARMACISTS ON STRIKE.

The *Lancet* reports that the pharmacists in Spain are so seriously aggrieved by a new law affecting their taxation that they are organising a movement to close their shops as a protest.

## Transactions of the Pharmaceutical Society.

### MEETING OF THE COUNCIL.

*Wednesday, August* 2, 1893.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Abraham, Atkins, Bottle, Grose, Hampson, Harrison, Hills, Leigh, Martindale, Richardson, and Rymer Young.

The minutes of the previous meeting were read and confirmed.

#### DIPLOMAS.

The undermentioned, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Allenby, John Edward.
Anderson, William.
Barley, Alfred Henry.
Booth, Samuel Verdon.
Buckle, John Dolphin.
Calvert, John.
Cleave, Reverdy.
Cooper, Albert John Bullen.
Corfe, Alfred Frederick.
Edwards, Robert Griffith.
Goulding, Ernest.
Guy, Frederick John Vavasour.
Jones, Geoffrey Stuart.
Marsden, Prosper Henry.
Moore, William.
Muir, Thomas Holmes.
Nunn, Arthur William.
Parker, Christian.
Parry, Frederick George.
Rose, Francis.
Stelfox, John Arthur.
Stephens, Frank Robert.
Tickle, Thomas.
Tilson, Annie Elizabeth.
West, Joseph Arthur.

#### ELECTIONS.

#### MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Anderson, William | Stalybridge. |
| Calvert, John | Bradford. |
| Cooper, Albert John Bullen | Ealing. |
| Goulding, Ernest | London. |
| Guy, Fredk. John Vavasour | Uppingham. |
| Marsden, Prosper Henry | Southport. |
| Muir, Thomas Holmes | London. |
| Nunn, Arthur William | Lower Sydenham. |
| Parker, Christian | Bath |
| Parry, Fredk. George | Thornaby-on-Tees. |
| Rose, Francis | London. |
| Stephens, Frank Robert | Clevedon. |
| Tickle, Thomas | Beaworthy. |
| Tilson, Annie Elizabeth | Long Sutton. |
| West, Joseph Arthur | Erith. |

*Chemists and Druggists.*

The following, who were in business on their own account before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Ker, Abiah | Manchester. |
| Openshaw, George Handel | Blackburn. |

### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Appleby, George Henry | Neyland. |
| Everett, Walter John | Halesworth. |
| Griffiths, Charles Henry | Openshaw. |
| Hepple, Thomas | Hastings. |
| Holt, William | Blackburn. |
| Jones, William | Porthcawl. |
| Stott, John William | Swansea. |

### ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as students) their subscriptions for the current year, were elected "Associates" of the Society:—

*Minor.*

| | |
|---|---|
| Allen, Samuel Joseph | Leicester. |
| Athey, George Hedley | Morpeth. |
| Barcham, James Norman | London. |
| Bartlett, Samuel George | Devonport. |
| Beedle, Leonard Edward | Weston-super-Mare. |
| Bellamy, Archibald John | Cardiff. |
| Betts, Harold George | Smethwick. |
| Boulton, Algernon | Lincoln. |
| Bowyer, Charles Henry | Petworth. |
| Brauer, Fredk. H. Ferdinand | Prestwich. |
| Brett, Thornton Pocklington | York. |
| Brooks, Albert Henry | Swindon. |
| Burrell, Frederick Charles | Midd Rasen. |
| Carr, Edward Crossley | Manchester. |
| Clark, Albert Massey | Ripley. |
| Cole, William Henry | Devizes. |
| Collins, John Henry | Mansfield. |
| Cran, Newell Burnett | Aberdeen. |
| Darling, John Martindale | Yarm. |
| Dean, George Saville | Rochdale. |
| Dennis, Tom Hawksley | Nottingham |
| Green, George Edward | Sevenoaks. |
| Grove, Thomas Sydney | London. |
| Hatfield, Victor John | Southampton. |
| Hellett, Frederick Charles | Brighton. |
| Hewitt, Stafford Smith | York. |
| Hodge, Ernest Alfred | Devonport. |
| Jackson, Henry | Witney. |
| Jewson, Wm. Thos. Nicholas | Long Eaton. |
| Kerr, Hugh | Dalbeattie. |
| Kirk, James Robert | Rawcliffe. |
| Lyon, Harold | Chatteris. |
| Marshall, Albert Edward | Birmingham. |
| Meats, William Edward | Leicester. |
| Minet, Noël Joseph Alphonse | Mauritius. |
| Moir, David | Glasgow. |
| Parkes, Arthur Chas. Vaughan | Upper Clapton. |
| Pickering, Walter | Darlington. |
| Ray, George Wheatcroft | Clifton. |
| Robinson, James Frederick | London. |
| Robson, Joseph Frederick | Bishop Auckland. |
| Savage, Thomas Evans | Caersws. |
| Smith, Frank | Bayswater. |
| Smith, Percy | Gloucester, |
| Walker, Arthur | London. |
| Ward, John | Bishop's Castle. |

### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Batt, Cutbert Stanley P. | Southsea. |
| Bryan, Howard William | Marshfield. |
| Carlé, George Henry T. | London. |
| Coggin, Archibald H. G. | Ware. |
| Dupuy, Edwin Stephen | Guernsey. |
| Elliott, Oliver Thomas | Leicester. |
| Ellis, John Alfred | Wisbech. |
| Fawn, Frank | Holbeach. |
| Hirst, Edward | Savile Town. |
| Johnston, Robert Bathgate | Methil. |
| Jones, John Closs | Fachwen. |
| Mather, Margaret Alice | Leamington. |
| Moss, Ernest Robert | Mansfield. |
| Roberts, John Thomas | Llanwrst. |
| Rowles, Edward | Reading. |
| Sill, John Westgarth | Bowness. |
| Silz, Oscar | London. |
| Swann, William B. | Barrow-in-Furness. |
| Thompson, James | Blackburn. |
| Whittle, Hugh | Manchester. |
| Wray, Albert Theodore | Liverpool. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and the restoration fee of one shilling.

### REPORT OF THE FINANCE COMMITTEE.

The report of this Committee was of the usual character, except that the payments of some items were authorised for two months, in consequence of the vacation.

The PRESIDENT (as Chairman of the Committee), in moving the adoption of the report, said there was nothing to which he need call special attention. The receipts, both on the general and Benevolent Fund accounts, had been small this month, as usual, but on the latter account some ground rents and dividends had been received; the payments had been £532 to annuitants and £40 in grants. The Donation account remained as before. The Orphan Fund had received two subscriptions, and the interest on the money invested in consols. This Fund, and also the General Benevolent Fund, had received a donation of five guineas, being a portion of the balance of the Guarantee Fund raised in Scotland last year in connection with the Conference.

The report and recommendations were unanimously adopted.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow (43) of a registered chemist and druggist, who had a similar grant last year, and has since been endeavouring to support herself by monthly nursing. She has five children to support. (Stratford, E.).

£10 to the widow (49) of a registered chemist and druggist. She has had three previous grants. (Reigate).

Two other applications the Committee had declined to entertain.

The VICE-PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. He had only to add that the daughter of Mrs. Downes would soon be nominated for the St. Anne's Asylum, and he hoped any members who had votes or influence would bear the case in mind, and do their best to secure her election.

The report was unanimously adopted.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

*Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| June . . | Day . . | 564 | 29 | 13 | 22 |
| | Evening . | 210 | 14 | 5 | 10 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| June . . . . | 209 | 124 | 85 | £1 1s. 10d. |

Donations to the Library had been announced (*Pharm. Journ.*, July 15, p. 52), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that a new edition of the Library Catalogue be prepared, and that 1000 copies be printed.

The Committee had ordered the Library and Museum to be closed entirely from September 1 to 14, inclusive; and closed in the evenings during August and September.

The Society's premises in Edinburgh to be closed from August 16 to 31, inclusive.

*Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| June . . | Day . . | 475 | 36 | 9 | 18 |
| | Evening | 121 | 15 | 1 | 5 |

Donations to the Museums of the Society in London and Edinburgh and to the Herbarium had been announced (*Pharm. Journ.*, July 15, pp. 52-53), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Staff of the Society's School had attended and reported on the various classes.

The Committee had recommended that the Librarian be requested to attend the meeting of the Library Association at Aberdeen in September. Also that the Museum of the Society be affiliated to the Museums Association.

*Herbarium Prize Competition.*

It was recommended that the conditions under which the Herbarium Prize is offered be modified by adding the words "the Channel Islands or the Isle of Man" after the words "collected in any part of the United Kingdom."

*Inaugural Sessional Meeting.*

It was recommended that this meeting take place on Monday, October 2, at 3 o'clock.

*New Buildings in Edinburgh.*

The plans for the proposed additional buildings at the Society's House in Edinburgh and the approximate estimate for their erection, fitting, and furnishing (£2225) had been considered. The Committee generally approved the plans, and recommended that they be remitted to the Executive of the North British Branch to be carried out, subject to any modification in details which might be made by a sub-committee consisting of the President, Vice-President, Treasurer, and Mr. Martindale.

The Sub-Committee had subsequently met, and was attended by the Assistant Secretary, Mr. Rutherford Hill, and Mr. Maben, and the plans were eventually approved.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. He said the formal part of the report called for no comment. The proposed alteration in the regulations for the Herbarium competition was to meet such a case as had recently occurred. The Committee recommended that the inaugural sessional meeting should be held at 3 o'clock on Monday, October 2, in order that the students might begin work as soon as possible, on the recommendation of the Staff of the School. It seemed to be more generally convenient to members and friends for the proceedings to take place in the afternoon, as it gave visitors an opportunity to inspect the School premises. The address would be delivered by Dr. Lauder Brunton. The most important part of the report was that referring to the new buildings in Edinburgh. It would be remembered that the Executive of the North British Branch sent in some time ago a carefully considered report with regard to covering in the yard or garden of the house, in order to provide better accommodation for the examinations in practical chemistry, dispensing, and pharmacy; the number of candidates entering, and the limited room, making it inevitable at present to extend the examinations over a longer time than was convenient. It was proposed that the stable at the end of the garden should be pulled down and form the entrance to the chemical laboratory, so that any fumes which might arise should be as far as possible removed from the houses in York Place. Beyond that and nearer the house would be the practical dispensing department and the practical pharmacy laboratory, where facilities for examining twenty-four candidates at a time would be afforded. It was the duty of the Society to take care that the means provided for testing the qualifications of candidates should be as perfect as possible, and the Committee therefore felt that this expenditure ought to be authorised and the work carried out. In addition to these laboratories there would be an intervening space between the practical pharmacy laboratory and the back of the present building, which would serve as a waiting room at examinations, and also for holding meetings. When these alterations were carried out, the establishment in York Place, and its equipment, would be fairly comparable to the premises now occupied by the Royal Colleges of Physicians and Surgeons in Edinburgh. The Committee felt that the patience and care with which every detail had been worked out by the Executive augured well for the accuracy of the estimates submitted, and consequently recommended that the scheme be adopted, and that it be remitted to the Executive to carry out. The sum named—£2225—included the necessary instruments and fittings, and if for any reason it was desired to exceed that amount, a further application would have to be made. The Executive had the advantage of having upon it one or two members of the Board of Examiners, and also the assistance of Mr. Rutherford Hill—the indefatigable Assistant Secretary—so that the Council might have full confidence that the work would be carried out with the utmost care. The plans were on the table if any member liked to examine them. Roughly speaking, the excavation and covering in of the space would cost £1000, and the remainder would cover the fittings and apparatus.

Mr. HAMPSON said it appeared to him, on looking over the plans, that the arrangements proposed had been thoroughly considered, and, in acceding to the recommendation of the Committee, he thought the Council would be taking a wise step, inasmuch as it would put the examinations in Edinburgh on practically the same footing as those in London. Scotland must not in this matter be allowed to fall behind in any respect. Naturally, as Treasurer, he felt that the amount involved was considerable, but he was somewhat hopeful of the financial position, and their Scotch friends were now doing all in their power to strengthen the Society. When this alteration was made the accommodation provided would, he thought, be of such a character as to do credit to the Society.

Mr. HARRISON said he had just spent a few days in Edinburgh, and of course took the opportunity of visiting the premises in York Place. He thought the accommodation, as it now stood, was hardly up to the requirements of the case, and was very glad when Mr. Hill explained to him what was proposed to be done. He was bound to say, having had some experience in such matters, that the arrangements seemed to be admirable, and when they were carried out the establishment would, he thought, be worthy not only of the Society, but of the great city in which it was placed. He thought the expense was moderate, and was amply justified.

Mr. Atkins also supported the recommendation, having gone over the plans in July last very carefully. He hoped one result of the extended accommodation would be a further growth of the Society in Scotland, and an increase both in membership and influence. He understood that the whole of these new buildings were to be on the ground floor, which was very satisfactory.

Mr. Martindale also supported the resolution. He understood that the expenditure was intended to be provided for out of revenue, and he hoped this would be accomplished. It was of the first importance to have the examinations in Edinburgh and London conducted on exactly similar lines.

Mr. Hills said he also visited the premises last autumn, and felt then that there was need for increased accommodation for the examinations, and also for the general work of the Society in Edinburgh. He wished to thank their Scotch friends for the trouble they had taken in the matter, and the success of their efforts was an instance of the successful working of the scheme under which the members in Scotland were asked to take charge of local matters.

The resolution was carried unanimously.

### Professorship of Materia Medica.

The President said Mr. H. G. Greenish had written to say that he would accept the professorship of materia medica on the terms mentioned in the letter sent him, and he therefore moved that Mr. Greenish be appointed Professor for the ensuing session.

The resolution was carried unanimously.

### The Jacob Bell Memorial Scholarships.

The Examiners appointed to conduct the examination for the Jacob Bell Memorial Scholarships had reported that thirty-three candidates had competed for the Scholarships, at the following centres:—Birmingham, 1; Bristol, 1; Canterbury, 1; Carmarthen, 1; Cheltenham, 1; Hull, 1; Lincoln, 2; Liverpool, 2; London, 16; Manchester, 3; Nottingham, 1; Peterborough, 1; Sheffield, 1; Worcester, 1. The envelopes bearing the mottoes of the successful candidates had been opened by the Committee and found to contain the following names:—

Thomas Anderson Henry ......Sevenoaks.
Charles Edmund Ashby.........Worcester.

who had, therefore, been awarded the Scholarships, subject to the approval of the Council.

The President said the report was very satisfactory, inasmuch as a considerable number of competitors had obtained sufficient marks to qualify for the Scholarship. There was an unusually good competition, and the complimentary remarks of Mr. Pinches, of the College of Preceptors, who carried out the scholastic portion of the examination, were very encouraging. He said he found a distinct improvement, not only in the knowledge of the candidates, but in the style of writing the papers. He moved that the report be received and adopted.

Mr. Atkins asked if there were not a larger number of candidates than usual.

The President said that was so; there was an improvement both in number and quality.

The resolution was carried, and a vote of thanks passed to Messrs. Ransom, Saul, and Pinches for conducting the examination.

### The Hanbury Medal.

The President said it would be remembered that once in two years the Daniel Hanbury memorial medal had to be awarded by the Presidents of the Linnean Society, the Chemical Society, the Pharmaceutical Society, the British Pharmaceutical Conference, and a pharmaceutical chemist nominated by the last two. A meeting was held on July 27 of these gentlemen (the pharmaceutical chemist nominated being Mr. Ransom), when the claims of various gentlemen were considered, and ultimately it was decided to award the medal to Professor Maisch, of Philadelphia. The first medal was awarded to Professor Flückiger, twelve years ago, at the meeting of the International Pharmaceutical Congress in London; and subsequent medals had been awarded to Mr. Elliot Howard, Professor Dragendorff, Dr. Dymock, Professor Planchon, and Professor Hesse, and this was the first occasion on which it had been awarded to a distinguished man in the United States. He had simply to ask the Council to pay the cost of the medal out of the fund standing to the credit of the account, and he would suggest that he be authorised to take it to the meeting of the International Congress at Chicago, to which he was a delegate, and ask the President of the Congress to present it to Professor Maisch.

This suggestion was agreed to.

### Divisional Secretary.

Mr. A. J. Phillips, 156, Cromwell Road, was appointed Divisional Secretary for South Kensington, in the room of Mr. Bowles, who was obliged to retire in consequence of ill health.

### Report of the General Purposes Committee.

The report of this Committee included the following reports on the Prize Examinations.

#### *Practical Chemistry.*

Professor Attfield had reported that the number of pharmaceutical students had been sixty-nine, being three more than the previous session, and two above the average of the past ten sessions. Thirty-nine pupils entered for the whole session as against twenty-nine last year. In the first week of the session forty-three entered as against thirty-eight in the first week of the previous session. The average length of entry per pupil was 7⅓ months as against 6¼ months last year. Most of the pupils worked for three hours daily, a few for four or six hours per day. These data showed that as regards the entries of students and the time they devote to practical chemistry, the efforts of the Council with respect to the educational laboratories are as successful as ever, and perhaps rather more so. With regard to the character of the work done, judging from continual observation by himself and his three assistants, by the records of the weekly revision classes, and the results of the two terminal examinations, Professor Attfield was of opinion that on the whole the work done was distinctly better than for several years past. Experience had shown him, however, that the pupils who can best respond at *vivâ voce* or written examinations are not necessarily the best workers at practical chemistry, and *vice versâ*. For the Council silver medal and certificates of honour thirty-five students had competed, the highest on the list obtaining the full number of marks.

#### *Chemistry.*

Professor Dunstan had reported that there were eighteen candidates for the sessional prizes, of whom the first, a Bell scholar, obtained 85 per cent. of marks. The whole class had been most regular and diligent, and, as Dean of the School, he had to say that the conduct of the students had been unexceptionable, and the work in each class satisfactory in every respect.

#### *Botany.*

Professor Green had reported that about half of his class had competed for the prizes, the examination being partly theoretical and partly practical.

#### *Materia Medica.*

Mr. Henry George Greenish had reported that during the summer term there were thirty-six entries, being five more than last year, five of whom, however, obtained leave to defer the course. The average attendance was twenty-seven per lecture. The general conduct of the class had been good, and sixteen students entered for the competition, but two failed to appear for the practical portion of the examination. Seven received over 75 per cent. of the maximum marks.

*Pharmacy.*

Mr. Joseph Ince had reported that eleven candidates competed from his class, no less than six of whom obtained sufficient marks to render them eligible for the silver medal.

*Prize Awards.*

Acting on the foregoing reports, the Committee had recommended that the following awards be made:—

**Practical Chemistry.**

*Silver Medal* ..................Frederick George Parry.
*Certificates of Honour* ...
William Moore.
Arthur Frederic Surfleet.
Charles Alexander Hill.

**Chemistry.**

*Silver Medal* ..................Thomas Tickle.
*Certificates of Honour* ...
Equal
Ernest Goulding.
Geoffrey Stuart Jones.
Francis Rose.

**Botany.**

*Silver Medal* ...............Charles Edwin Robinson.
*Certificates of Honour* ...
Francis Rose.
Thomas Tickle.
Ernest Goulding.

**Materia Medica.**

*Silver Medal*..................Francis Rose.
*Certificates of Honour* ...
Ernest Goulding.
Joseph Arthur West.

**Pharmacy**

*Silver Medal*..................Thomas Tickle.

*Council Examination Prizes.*

Messrs. A. E. Tanner and W. M. Holmes, who had been appointed to conduct this examination, had reported that fourteen candidates competed for these prizes, and made the following awards:—

*Pereira Medal (Silver); and Books value £5, presented by the late Thomas Hyde Hills.*
Thomas Tickle.

*Pharmaceutical Society's Medal (Silver); and Books value £3, presented by the late Thomas Hyde Hills.*
Annie Elizabeth Tilson.

*Pharmaceutical Society's Medal (Bronze); and Books value £2, presented by the late Thomas Hyde Hills.*
Francis Rose.

The President moved the adoption of this portion of the report of the Committee, and the consequent award of the prizes. In so doing he drew attention to the fact that for the second time a lady had won the Society's silver medal.

The resolution was carried unanimously, and a vote of thanks was passed to Messrs. Holmes and Tanner for conducting the examination.

*Manchester Pharmaceutical Association Scholarship.*

The report of the General Purposes Committee also stated that the Founder of this Scholarship having expressed his approval, it was recommended that £50 from the accumulated interest in hand be awarded to Mr. H. A. D. Jowett, to enable him to work for an additional year in the Research Laboratory.

*Redwood Scholarship.*

Several applications had been received for this scholarship, and the Research Committee had recommended that it be awarded to Mr. Thomas Tickle. The Research Committee had also expressed its desire to admit five additional workers to the Research Laboratory, but could not do so without a further grant to meet working expenses, and the Committee therefore recommended that an additional grant of £50 be made to the Research Committee.

The Committee had recommended that a special letter of thanks be sent to Mr. Perrèdes, of Jersey, for the herbarium presented to the Society, with an expression of regret that he was technically ineligible to enter for the competition, or the high merit of his collection would no doubt have secured permanent recognition.

The President, in moving the adoption of this part of the report, said that although a sum of money had been given in the north to found a scholarship of about £30 a year, there had hitherto been no competitors for it. Having been struck with this fact, he communicated with Mr. Benger, who was President of the Manchester Pharmaceutical Association at the time the scholarship was founded, and he put himself in communication with the founder, and seeing that there was in the Research Laboratory a most promising worker, who had been a Redwood Scholar, and who was within the terms of the trust deed, in one sense, having been born and apprenticed within the district named, the suggestion that such portion of the money in hand as the Council thought fit should be awarded to him in order that he might continue his work was readily acceded to. Technically, the scholarship could not be awarded to him, though the Council had power, with the consent of the donor, to make alterations in the terms of the trust deed, and possibly some alteration might be suggested by the donor himself; but with characteristic generosity he had at once fallen in with the suggestion to use the accrued interest in this way, which was within the spirit of the trust. There were six applications for the Redwood Scholarship, and the Research Committee having gone through the results of the class examinations, and the examination by the Board of Examiners, thought it unnecessary to impose any further test, but recommended that the scholarship be awarded to Mr. Tickle. The remaining five applicants desired to work in the Research Laboratory, without any remuneration, for the sake of advancing their own education, but as this would involve extra outlay, the Committee recommended that an additional grant of £50 be made to the Research Committee. With regard to the Herbarium, Mr. Perrèdes presented to the Society a very beautiful collection a few weeks ago, and though by the regulations in force it was not eligible to compete for the medal, it was thought desirable to ask Professor Green's opinion upon it. This having been obtained, and found to be of the highest character, it was recommended that a special letter of thanks be sent to Mr. Perrèdes, who would undoubtedly have gained the medal had he been eligible to compete.

Mr. Atkins asked on what ground he was ineligible.

The President said the regulations prescribed that the plants should be collected in the United Kingdom, which, technically, did not include Jersey. The regulation had now been altered, but it could not be done in time to admit Mr. Perrèdes to the competition.

Mr. Hills supported the recommendations, congratulating the Society on the fact that there were six students able and willing to work in the Research Laboratory for another year, five of them at their own expense.

This portion of the report of the General Purposes Committee was adopted, and Mr. Thomas Tickle was elected Redwood Scholar for the ensuing year.

The Council then went into committee, as usual, to consider the legal portion of the report of the Committee. This included the monthly report from the solicitor He stated that an appeal had been entered in the case of Delve, of Manchester, but there was little prospect of its being heard before the long vacation. He also gave particulars of payments made by defendants who had consented to judgment, or where judgment had been obtained. Several cases were still standing for trial.

A large number of alleged infringements of the Pharmacy Acts were reported to the Committee, and proceedings were recommended in every case.

On resuming, this portion of the report of the General Purposes Committee was also adopted, and resolutions were passed authorising the Registrar to take proceedings against the offenders named.

### REPORT OF EXAMINATIONS.

*July*, 1893.

| | Candidates. | | |
|---|---|---|---|
| | Examined. | Passed. | Failed. |
| England and Wales:— | | | |
| Major | 52 | 25 | 27 |
| Minor | 213 | 67 | 146 |
| Modified | 2 | 1 | 1 |
| Total | —267 | — 93 | —174 |
| Scotland:— | | | |
| Major | 3 | 0 | 3 |
| Minor | 97 | 41 | 56 |
| Total | —100 | — 41 | — 59 |
| First examination | 398 | 208 | 190 |

Eleven certificates were received in lieu of the Society's First examination.

### RESIGNATION OF AN EXAMINER.

The **PRESIDENT** said Mr. T. P. Blunt had received the offer of an office from the Technical Instruction Committee of the County Council, which rendered it necessary for him to resign his office as an Examiner of the Society.

The **VICE-PRESIDENT** moved that this Council regrets the resignation of Mr. T. P. Blunt from the Board of Examiners, and desires to express its appreciation of the services he has rendered during the eight years he has been connected with the Board.

The **PRESIDENT**, in putting the question, said Mr. Blunt was, he believed, the first representative of the pharmaceutical world who had passed through the curriculum of one of the ancient universities, being an M.A. of Oxford. He was a pupil many years ago of Sir Benjamin Brodie, succeeded in due course to his father's business at Shrewsbury, and eight years ago was appointed an Examiner of the Society. He was very sorry that Mr. Blunt found it impossible to continue a member of the Board, because both in knowledge and in moral characteristics he had all the qualifications for an Examiner, such as were rarely found united in one man. They could only hope that in the career he was about to follow as a teacher of agricultural chemistry, an analyst, and a pharmaceutical chemist, the calls upon him would not be so exacting as to prevent him continuing to take an interest in the welfare of the Society. It was sometimes said that a university training was not adapted to commerce, pharmacy, or trade, but he thought the tendency of things seemed to show that in many cases it depended rather on the spirit of the individual himself whether his education was a help or a drawback in his relations with the public. Mr. Baildon was a university graduate, and Mr. Druce, another examiner, was also an M.A. of Oxford.

The resolution was put and carried.

### PROPRIETARY MEDICINES.

A memorial from the Nottingham and Notts Chemists' Association, in reference to the sale of stamped proprietary articles, was read and referred to the General Purposes Committee for consideration.

## EXAMINATIONS IN LONDON.

*July*, 1893.

(*Continued from page* 94.)

### MINOR EXAMINATION.

*Two hundred and thirteen* candidates were examined. *One hundred and forty-six* failed. The undermentioned *sixty-seven* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Allen, Samuel Joseph | Leicester. |
| Athey, George Hedley | Morpeth. |
| Barcham, James Norman | London. |
| Bartlett, Samuel George | Devonport. |
| Beedle, Leonard Edward | Weston-super-Mare. |
| Belcher, Charles Herbert | Stafford. |
| Bellamy, Archibald John | Cardiff. |
| Betts, Harold George | Smethwick. |
| Boulton, Algernon | Lincoln. |
| Bowyer, Charles Henry | Petworth. |
| Brauer, Fredk. Hy. Ferdinand | Prestwich. |
| Brett, Thoroton Pocklington | York. |
| Brooks, Albert Henry | Swindon. |
| Burrell, Frederick Charles | Midd Rasen. |
| Carr, Edward Crossley | Manchester. |
| Clark, Albert Massey | Ripley. |
| Coe, Hedley | East Rudham. |
| Cole, William Henry | Devizes. |
| Collins, John Henry | Mansfield. |
| Corney, Frank Norman | London. |
| Davies, Thomas | Lampeter. |
| Dennis, Tom Hawksley | Nottingham. |
| Evans, John | Lampeter. |
| Fairburn, Thomas White | Northallerton. |
| Flower, Edward Harold | Derby. |
| French, Montague Robert | Gosport. |
| Goodall, Horatio Charles | Lincoln. |
| Green, George Edward | Sevenoaks. |
| Grove, Thomas Sydney | London. |
| Hancock, Fred | Oldham. |
| Hatfield, Victor John | Southampton. |
| Hellett, Frederick Charles | Brighton. |
| Hewitt, Strafford Smith | York. |
| Hodge, Ernest Alfred | Devonport. |
| Howes, William | Cambridge. |
| Hunt, Archibald James | Reading. |
| Ireland, Alfred James | Stroud. |
| Izon, William | Worcester. |
| Jackson, Henry | Witney. |
| James, George Christopher | Yardley. |
| Jesper, Charles Frederick | Manchester. |
| Jewson, Wm. Thos. Nicholas | Long Eaton. |
| Kellett, William Herbert | Bolton. |
| Kirk, James Robert | Rawcliffe. |
| Laws, John Joseph | London. |
| Liddle, Thomas Martin | Middlesborough. |
| Lyon, Harold | Chatteris. |
| Marshall, Albert Edward | Birmingham. |
| Martin, William Herbert | Ipswich. |
| Meats, William Edward | Leicester. |
| Minet, Noël Joseph Alphonse | Mauritius. |
| Parkes, Arthur Chas. Vaughan | Upper Clapton. |
| Pickering, Walter | Darlington. |
| Ray, George Wheatcroft | Clifton. |
| Robinson, James Frederick | London. |
| Robson, Joseph Frederick | Bishop Auckland. |
| Roper, Herbert Carr | Oundle. |
| Rowcroft, Charles Edward | Maidstone. |
| Saunders, Frederick George | London. |
| Savage, Thomas Evans | Caersws. |
| Smith, Percy | Gloucester. |
| Smith, William | Durham. |
| Smith, William Henry | Alton. |
| Walker, Arthur | London. |
| Ward, John | Bishop's Castle. |
| Ward, Joseph William | Gloucester. |
| Woodward, John Thompson | Hull. |

# British Institute of Public Health.

## EDINBURGH CONGRESS, 1893.

The Annual Congress of the British Institute of Public Health, which was this year held for the first time in Scotland, was opened in Edinburgh on Thursday, July 27, in the Humanity Class-Room of the University, at 11 a.m. The suitability of Edinburgh as a meeting place has led to a large attendance of members, and it is estimated that about 400 have taken part in the various meetings.

The Pharmaceutical Society of Great Britain was represented by Mr. J. Laidlaw Ewing, Edinburgh, and Mr. David Storrar, Kirkcaldy. Mr. Charles Kerr, Dundee, who was also appointed a delegate, was unable to attend. The Pharmaceutical Society of Ireland was represented by Mr. J. C. C. Payne, of Belfast, and Mr. J. Harrison, of Sunderland, was also among the visitors. Additional *éclat* was given to the sittings of the Congress by the attendance of the Lord Mayors of London and Dublin, who were paying a state visit to the city at the same time.

At the opening ceremony the retiring President, Sir Charles Cameron, briefly resigned his trust to the hands of Dr. Hendry D. Littlejohn, Medical Officer of Health for Edinburgh, who had been elected President for the year.

On the motion of Dr. Russell, Lord Provost of Edinburgh, the thanks of the Institute were awarded to Sir Charles Cameron.

The President then delivered his presidential address, in which he gave a brief sketch of the way in which some important problems connected with sanitation had been dealt with in Edinburgh during the last fifty or sixty years. The high price of land in Edinburgh gave rise to the well-known system of tenement houses, which brought with it all the evils of overcrowding, from which they got relief by the city improvement scheme, inaugurated by the late Dr. William Chambers, and a similar scheme was being initiated by the present occupant of the civic chair, and had received the sanction of Parliament. The question of an adequate supply of pure water had also been faced. They had taken possession of all the springs on the Pentland range, but these were not enough, and they had then gone to the Moorfoot watershed, but even this was proving inadequate, and at present they contemplated a scheme by which they would bring a supply from the watershed of the Tweed to a city in the watershed of the Forth. Dealing with the question of sewage, he said that the slop water of the Old Town had for two hundred years made its way to the sea, and in its course converted the Craigentinny Sewage Meadows, a sandy waste land to the east of Edinburgh, into one of the most fertile spots in the Lothians, yielding a yearly income of £40 per acre. The disposal of solid refuse had been a difficulty owing to its worthlessness for manurial purposes, and the Corporation had decided to try the experiment of destroying it, and one destructor was being erected, and would be open to the inspection of the members. The question of amalgamating small burghs was early faced in Edinburgh, and the public health administration of the town had been greatly aided by the Municipal Act obtained from Parliament in 1771. This Act was the model upon which all subsequent Acts relating to England, Scotland, or Ireland had been framed. The two great problems they still had to face in Edinburgh were the constant noise of the street traffic and the damage done to their lungs and their houses by the waste of fuel in the shape of smoke. At the conclusion of the address the Congress separated into the three sections of—

(*a*) Preventive Medicine, under the presidency of Dr. J. B. Russell, Medical Officer of Health, Glasgow.

(*b*) Sanitary Engineering, under the presidency of Professor G. F. Armstrong, Edinburgh University.

(*c*) Chemistry and Climatology, under the presidency of Professor A. Crum Brown, of Edinburgh University.

The meetings of the sections continued daily, except on Saturday, till Monday, July 31, when the proceedings concluded with a general meeting of the Institute in the Natural History Class-Room.

In the section of Preventive Medicine, Dr. Leslie Mackenzie urged the necessity of teaching technical hygiene in connection with County Councils.

Miss Charlotte Smith advocated the appointment of female sanitary inspectors, such as are at present employed in Glasgow and Manchester. They would attend to cleanliness and the proper feeding of children in the slums, as well as to such matters as sanitation in fashionable ladies' private schools.

Dr. J. E. Squire, of London, introduced a discussion on the treatment of consumption as an infectious disease, and considerable evidence was adduced in favour of this view.

The control and inspection of meat supply was dealt with by Councillor Pollard, of Edinburgh, who gave a highly eulogistic description of the abattoirs or central slaughter-houses of Berlin. Under this system the whole meat supply was minutely inspected before it reached the consumer, and it was so conducted as to yield the corporation a return of 4 per cent.

Principal Walley and Professor Glaister supported the plan of having a central clearing-house such as existed in Berlin.

Dr. Cartwright Wood, of London, read a paper on "Filtration of Water Supplies and Sewage Contamination," in which he said to regard the subject as a purely bacteriological one, and to minimise the importance of sewage contamination, would inevitably encourage the further pollution of the great natural water-courses.

Dr. Chalmers read a paper on "Prevention of Smallpox," and Dr. Sims Woodhead one on "Protective Inoculation." The latter said preventive inoculation might be brought into much larger use than it was in a great number of diseases. The manufacture of the protective material requires a certain amount of skill, and it was necessary that certain people should devote themselves almost entirely to the preparation of the material. Until they had some system by which certain men should devote a considerable time to the preparation of the material, it would be exceedingly difficult to obtain all the benefit that might be gained by protective inoculation.

Dr. Hunter Stewart, Edinburgh, and Dr. Carmichael, Glasgow, dealt with the subject of ventilation. The former advocated a free use of soap and water as a means of purifying the atmosphere of schools. It was stated that one great obstacle was the ignorance of beadles, janitors, and caretakers, who failed to make proper use of even the best ventilating appliances.

In the section of Sanitary Engineering the President, Professor Armstrong, gave an address dealing with the connection between the science of engineering and the maintenance and promotion of public health.

At the first day's sitting the time was mainly occupied by a discussion on "Fever Hospitals," the importance of having adequate accommodation of a permanent kind to cope with an epidemic being strongly insisted on.

On the second day the discussion was devoted to "Drainage and Refuse Disposal." Mr. Cooper, Burgh Engineer, Edinburgh, described the Water of Leith Purification Scheme, by which, at a cost of £240,000, the Corporation of Edinburgh had removed all sewage from the water of Leith, a small stream running through the western and northern districts of Edinburgh and entering the Forth at Leith.

Mr. Horsfall, of Leeds, read a paper on "Refuse Destructors," and Mr. Cooper stated that in Edinburgh they were putting up one of Fyer's destructors, and it was intended to use the heat for the generation of steam, and the steam power was to be used for grinding the "clinkers" or ashes from the destructor, and also for developing electricity for use in the works. The last sitting of the section was occupied in considering the water supplies of Glasgow and Edinburgh. It was stated that the consumption of water in Glasgow was 50 gallons per head per day, and in Edinburgh 37 gallons per head per day, while the average quantity in the large towns of England was only 28 gallons per head per day. The cistern system for culinary purposes was condemned, and it was recommended that water should be obtained direct from the main.

In the section of Chemistry and Climatology the first day was devoted to a discussion on the purity of domestic water, introduced by Dr. Ivison Macadam, of Edinburgh. Summing up the views expressed in his communication, Dr. Macadam said he considered that the saline ingredients should be small in amount; that nitrates and nitrites should be absent; that chlorine should be low, except near the sea; that the dissolved gases should contain little carbonic acid gas, and that the oxygen and hydrogen should be in the proportion of one to two; that the saline and albuminoid ammonia should be low, but that if the latter was high, care should be taken to see that the result was not due to harmless vegetable matter; and that the waters which acted most on lead were those containing carbonic acid derived from decomposition.

Sir Charles Cameron, of Dublin, said, as to the detection of organic impurities in water, he did not agree with the view that the biological methods were more reliable than the chemical methods, although he was quite aware that in some cases of organic matter the chemical analysis could not detect its presence. Still, it was not the numbers of micro-organisms in water, but the character of them that was of importance, and, therefore, he did not attach greater importance to the biological methods of analysis than to the chemical methods, while, at the same time, recognising their great value.

In the course of the discussion, the use of water from shallow wells for domestic purposes was strongly condemned.

Dr. Thresh, Medical Officer of Health of Essex, expressed the view that no one was justified in giving an opinion as to the purity and fitness of water for domestic purposes unless he knew the whole history of the water.

On the second day, Dr. Buchan, of Edinburgh, read a paper on scarlet fever in relation to climate, in which he said the investigation, so far as London was concerned, had brought out the fact, important to medicine, that each of the separate periods of climate there—for the climate of London might in the year be divided into six periods—had its own group of mortality from special diseases, and that those diseases which reached their maximum mortality in a particular period of the year all centred in certain parts of the human system. For example, in winter the mortality was connected with diseases of the throat and general weakness of the system; in the heat of summer the maximum mortalities were restricted to bowel complaints, and in spring to the nervous and skin diseases. This fact, too, had been ascertained, that there were, over and above, some diseases on which the change of climate had no influence at all. The allied diseases of scarlet fever, diphtheria, and typhoid stood out alone during the warm and damp season of the year, and the attacks of the diseases seemed to be carried on into the dry and cold period.

Professor P. F. Frankland, of Dundee, contributed a paper on the bacteriological examination of water, and spoke strongly in favour of sand filtration as an effective means of destroying micro-organisms in water for domestic purposes.

Dr. Hunter Stewart, of Edinburgh, referring to the methods for filtration of Edinburgh water at the Alnwick Hill Reservoir, said, speaking broadly, there were from about 80 to 100 micro-organisms in the cubic centimetre of Edinburgh water after filtration. The number, however, was sometimes very small indeed—on several occasions in winter it had fallen to zero, and very often it was about 9 and 10 per half cubic centimetre of water, which was the quantity that he was in the habit of examining. This year they had experienced a severe drought, and during the time of the drought he had examined the water. After filtration it showed very little change from the normal so far as the number of micro-organisms was concerned, although the bacilli in the water must have been increasing very considerably when the reservoirs were so low. Two days before the rain came the micro-organisms were less than 150 per cubic centimetre; but the day on which the weather broke they rose to 3700 per cubic centimetre in the filtered water. The day following the number was 2000; the next day, it was 1400; and the number gradually fell to the normal. Although he was a great believer in sand filtration, there they had a case where sand filtration was unable to cope with a condition of affairs suddenly arising.

Professor Frankland said the water to be filtered should be introduced below the sand bed and allowed to rise through it. In the case of Dundee, the loch from which the water supply was derived had become lower and lower during the drought, and still the number of micro-organisms in the water supplied to the town had been remarkably small. It had frequently been contended by those of the German school of bacteriologists who had examined into the matter that sand filters working properly arrested the progress of all the micro-organisms in the water. He had always held that that was not the case—that even after sand filtration the water would contain a certain number of bacilli. In fact, the number of micro-organisms remaining in the filtered water would just be in proportion to the number which were in the water before its filtration. For general purposes, Dr. Frankland added, the chemical analysis of water was far more important than the bacteriological.

Dr. Mansfield Robinson, solicitor, and clerk to the central authority of Shoreditch, London, read a paper on "The Sale of Foods and Drugs Act." In his opinion, the following amendments were required on the present law:—The fixing of the minimum penalty, and the increasing of the penalty after the first offence; provisions which would enable the innocent retailer to bring before the court the guilty wholesale dealer or other person causing the adulteration; that antiseptics, cosmetics, and preparations for cooking should come under the scope of the Act, and that the labels setting forth the amount of adulteration in the article should be clearly printed.

On the motion of Dr. Allan, Medical Officer of Health for the Strand district of London, a resolution was adopted declaring that, in the opinion of the Institute, a Parliamentary inquiry into the working of the Foods and Drugs Adulteration Act was requisite.

On the third day, Mr. John Aitken read an interesting paper on "Instruments for Observing Atmospheric Dust," and gave a practical demonstration of their use, and explained the effect of dust particles in the air in forming nuclei of condensation, and thus causing rain, fogs, and mists. Outlining some of the results derived by him from five years' observations with the dust counter in various parts of Europe, Mr. Aitken said that along the French Riviera and at the Italian lakes he had never got very pure air. It never went below 1000 particles per cubic centimetre. On the Rigi Kulm, 6000 feet above the level of the sea, in the course of five years' observations he had found as high a number as 16,000 per cubic centimetre, and as low as 210. In the West Highlands the highest number observed was 7600, and the lowest 16. On Ben Nevis the number found was as small as 1, and even this was got with difficulty. It was more difficult to determine the numbers in cities, as it so much depended upon the district in which the observations were taken; but in the London parks he had found generally 100,000 particles per cubic centimetre. One result of these investigations had pointed to the conclusion that the haze in the atmosphere was due to dust particles. Concluding with some remarks upon fogs, Mr. Aitken pointed to the importance of sulphurous compounds in causing their formation and their continuance. As long, he contended, as we failed to get rid of sulphurous compounds, it did not matter how perfect was our system of smoke combustion, we should simply be quit of the smoke in the fog, and not of the fog as fog.

Dr. T. Ewa, of Manchester, referring incidentally to the theory advanced by Mr. Aitken, mentioned that they found in Manchester that during a dense fog there was ten times as much sulphurous acid in the air as in ordinary circumstances. The effect of the atmospheric impurities on the light was shown by the fact that in ordinary circumstances the town received about half the light received by the suburbs, and a moderately dense fog cut off at least 95 per cent. of even that light.

Papers by Dr. Stevenson Macadam, of Edinburgh, on "Prevention of River Pollution by Papermaking Discharges," by John Hunter, of Edinburgh, on "Soils," and by Dr. G. C. Purvis, of Edinburgh, on "Sewage Precipitation," concluded the business of the section.

Afterwards a general meeting of the members was held in the Natural History Class-Room to hear a paper on "Cremation," by Sir Spencer Wells, of London.

Bishop Dowden, Edinburgh, in moving a vote of thanks to Sir Spencer Wells for his address, said he was sure no sound religious sentiment could exist which set feelings and fancies in relation to the dead in opposition to the interests and well-being of the living. That matter of burial must be taken out of private hands altogether and left to the State.

Sir Charles A. Cameron, Dublin, seconded the vote of thanks, which was cordially adopted.

On the motion of the President, the following resolution was unanimously agreed to:—"That this meeting of the British Institute of Public Health, recognising the dangers attending on the present system of burying the dead, hereby records the opinion that the time has now come when cremation should be adopted, especially in the case of death from infectious diseases, and that local authorities should be empowered by Parliament to build crematoria, and conduct them under adequate supervision.

A general meeting of the Institute was held on Saturday, July 29, in the Natural History Class-Room. The annual reports were adopted by acclamation on the motion of Professor W. R. Smith, of London, and, after resolutions concerning the training and examination of sanitary inspectors, the registration of plumbers, and the disposal of the sewage had been adopted or confirmed,

Mr. Ernest Hart, editor of the *British Medical Journal*, read a paper on "Cholera Nurseries and their Suppression." He said he claimed to have now established on an overwhelming basis of evidence collected from every part of Europe the dicta—founded upon the original investigations by Snow and Simon on the British epidemics of 1848 and 1854, and by himself and Radcliffe of the East London epidemic of 1866—(1) That cholera was a filth disease, carried by dirty people to dirty places, and diffused by specifically poisoned water; (2) that one might eat cholera and drink cholera, but could not catch cholera; and that cholera might be considered for all practical purposes as an exclusively water-carried disease, and that it was carried only by water poisoned by human discharges. Cholera was a man-created epidemic, carried along the lines of human communication. Its home was in India, and its gathering grounds and sally gates were the Indian fairs and Meccan pilgrimages. Mecca was the place in which to stop the cholera.

On the motion of the Lord Mayor of Dublin, the thanks of the Institute were awarded to Mr. Hart, and the meeting then closed.

In connection with the meetings of the Congress, an interesting series of excursions, etc., had been arranged to Edinburgh Castle, George Heriot's Hospital, the Parliament House, St. Giles' Cathedral, the Municipal Buildings, Craigentinny Meadows, Leith Docks, Craigmillar Castle, the Alnwick Hill Reservoir, the Forth Bridge, and Holyrood Palace and Abbey, and a reception of the Members of Congress by the Lord Provost and magistrates took place in the Museum of Science and Art on the evening of Thursday, July 27. On the evening of Monday, July 31, the members were entertained to dinner by the Royal College of Physicians, and the Royal College of Surgeons held a reception in the Art Galleries, Mound, on the evening of Saturday, July 29.

## Parliamentary and Law Proceedings.

### PROSECUTION UNDER THE PHARMACY ACT.

At the Oldham County Court, on Thursday, before his Honour Judge Edwin Jones, an action was brought by the Council of the Pharmaceutical Society of Great Britain (through Mr. Richard Bremridge, the Registrar of the Society) against Matthew Marsden, a shopkeeper, of No. 82, Huddersfield Road, Oldham. The claim was for £5, the amount of penalty incurred by the defendant on April 21, 1893, in keeping open shop for the retail, dispensing and compounding of a certain poison, viz., chlorodyne, a preparation of morphine. Mr. Flux, solicitor, of London, appeared for the Pharmaceutical Society, but the defendant did not answer in person, nor was he represented by anyone.

Mr. Flux, in opening the case, said the action was brought by the Pharmaceutical Society under section 15, cap. 121, 31 and 32 Victoria, of the Pharmacy Act of 1868, which was framed to, among other things, protect the public in the matter of the sale of poisons, and gave power for the recovery of £5 from anyone other than a registered chemist who kept open shop for the sale of poison. Mr. Flux put in the register of the Society, remarking that the defendant's name did not appear in it.

His Honour examined the list, and said that Mr. Flux was perfectly right. The name was absent from the list.

Mr. Flux said as the defendant did not appear he would shortly prove his case.

Arthur Foults, private inquiry agent, of Salford, stated he knew the defendant's shop at No. 82, Huddersfield Road, and on April 21 he visited the place by the instructions of the Pharmaceutical Society, and purchased the bottle of chorodyne produced. He labelled it and marked it, and after keeping it some time handed it to Mr. H. Moon, one of the officials of the Society.

Harry Moon, clerk in the office of the Registrar of the Society, said he received the bottle from the last witness, and handed it to the analyst.

Ernest John Eastes, analyst and Fellow of the Institute of Chemistry, deposed that he received the bottle, which was then sealed, from the last witness. He analysed the contents and found they contained morphine, which is a poison within the meaning of the Act.

Albert Fox, bailiff to the Oldham County Court, said he served the summons, and he knew that the defendant was the keeper of the shop, No. 82, Huddersfield Road.

Mr. Flux: That is my case.

His Honour: I have no power but to impose the penalty, therefore there will be a verdict for £5 and costs.

Mr. Flux: In cases of public importance you have power to give costs on the higher scale.

His Honour: I give you costs on the higher scale.

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### AN EXCISEABLE MEDICATED WINE.

A case of some interest to druggists was disposed of in the Maxwelltown J.P. court on Thursday, July 27.

Mr. Stewart, druggist, Castle-Douglas, was charged at the instance of the Board of Inland Revenue, and pleaded guilty to selling a bottle of foreign wine to a Revenue officer. It was stated that the article was Coleman's Wincarnis or Liebig's extract of meat and malt wine, and that on analysis at Somerset House it was found to contain 42 per cent. of proof spirit—was simply mere wine with an admixture of flavouring matters. Mr. Stewart explained that it was not sold as a beverage, and being frequently prescribed by the faculty he now found it necessary to keep a few bottles in stock. It was not kept by licensed grocers.

In answer to Sheriff Lyell, Mr. Hawley, collector of taxes, said though this was the first case in court, it was not the hundred and first case that had been before the Commissioners, and druggists knew they were not entitled to sell the article.

A fine of £1 was imposed.—*Scottish Leader.*

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### PROCEEDINGS UNDER THE FOOD AND DRUGS ACT.

#### VINEGAR PROSECUTION.

Miss Margaret Small, 215, Main Street, Gorbals, was charged in the Sheriff Summary Court, on Friday, July 28, with selling on May 26 a bottle of malt vinegar to sanitary inspectors Inglis and Murray, which on analysis by Dr. Clark was certified not to be genuine malt vinegar, but simply diluted acetic acid. In the course of the evidence, an officer admitted that the respondent offered him a smaller bottle labelled "malt vinegar." The bottle received was labelled "Glen Ochil."

For respondent it was stated that she had never previously been asked for "malt vinegar." She had three kinds of malt vinegar. She paid the same price for each, and sold them each at the same price. Intimation of the case had been given to Messrs. Hannay, the wholesale dealers, and they had left her to fight it out herself. She had no money to spend on expensive analyses.

Sheriff Birnie said there had been no intention to defraud, but he must hold from the analyst's certificate that it was not malt vinegar. The respondent did not seem to know the difference between one kind of vinegar and another, and that was what the sanitary inspector should turn his attention to, and save the public from imposition. Had this case occurred after the last case, which must have attracted the attention of merchants who sold malt vinegar, the penalty would have been substantial. The fine in this case would be 10s.—*Glasgow Evening News.*

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### POISONING BY WEED KILLER.

On Monday, July 31, an inquest was held by Mr. Dossey Wightman, at the Rockingham Arms, Wentworth, on the body of Wm. Shillito (74), of Lee Cottages, who died from the effects of poisoning, on Friday morning.

Mrs. Shillito, the widow, said deceased had been in the service of Earl Fitzwilliam as a gardener for upwards of 50 years. On Thursday evening, about six o'clock, he was brought home ill and wanted to go to bed. He said he went into the mushroom shed to have a drink and drank out of the wrong can, which contained "weed destroyer." He got gradually worse, and witness sent for Dr. Barr, who gave him an emetic, but he died at 12 o'clock.

Wm. Totty, foreman gardener to Earl Fitzwilliam, said the liquid deceased drank of is known as Bentley's "weed destroyer." Witness put it in the mushroom shed about a fortnight ago. The deceased was there, and he told him it was poison. The liquid was about the same colour as beer, but as far as he knew there had been no beer in the shed. The deceased had no business there, and it had never been his duty to interfere with this can.

By a juror: If any one had beer anywhere in the gardens this would be one of the most likely places.

Mr. Hughes, head gardener, said the principal ingredient in the weed destroyer was arsenic, and the liquid deceased drank was the sediment out of one of the casks, and had not been diluted, as it had to be before using on the paths.

The jury returned a verdict that the deceased died through drinking inadvertently of the poisonous liquid in question.—*Sheffield and Rotherham Independent.*

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### SUICIDE BY POISONING.

Dr. G. Danford Thomas held an inquest on Monday, July 31, at the Islington Coroner's Court, on the body of Antoine Verpilleux, aged 26, a native of Caen, a teacher of languages, who lodged at 10, Hunter Street, Euston Road. The deceased was, it seemed, friendly with Mr. Burgwitz, of 44, Davenant Road, Holloway Road, with whose daughter Jessie he was in love, but she did not encourage his attentions. This young lady said the deceased had before threatened to shoot himself, and on last Friday night he caught hold of her. She repulsed him, and he then showed her the small jar produced. (This was labelled "Extract of opium—Poison. Burgoyne, Burbidges and Co., export druggists, Coleman Street, London.") Witness ran to her mother's bedroom, and told her he had threatened to take poison. When she went downstairs again he was lying on a couch, and had evidently taken some of the poison. He was removed to the Great Northern Central Hospital close by.

Dr. James Cooper, resident medical officer at this institution, said the deceased died within five hours of his admission. The amount of extract of opium which witness got out of him with the stomach pump would alone suffice to kill fifty people. He had taken nearly half an ounce of the poison, which was opium in its strongest and most concentrated form.

The Coroner expressed his surprise that the deceased could become possessed of so large a quantity of such deadly poison, but pointed out that the jar was properly labelled.

The jury returned a verdict of "Suicide while of unsound mind."

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*A. Duncan.*—We possess no information on the subject you refer to.

*Robert Parslow.*—Refer to the list of text-books on page eight of the syllabus of the Society's School of Pharmacy.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Grace, Hill, Idris, Russell, Shenstone, Storrar, Walsh.

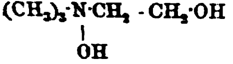
# CHOLINE, NEURINE, AND ALLIED COMPOUNDS.[*]

BY PROFESSOR ERNST SCHMIDT.

On comparing the chemical constitution of trimethylamine derivatives with their physiological action it is evident that apparently slight chemical differences are accompanied by essential differences in their action upon the animal organism. Thus choline, $C_5H_{15}NO_2$, and betaine, $C_5H_{13}NO_3$, are comparatively innocuous, while muscarine, $C_5H_{15}NO_3$, and neurine, $C_5H_{13}NO_3$, are intensely poisonous.[†]

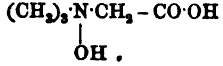
Choline and betaine bear the same relation to each other as a primary alcohol to the corresponding monobasic acid. Muscarine, an intermediate product of the oxidation of choline,[‡] has properties which place it between choline and betaine, as an aldehyde, while neurine differs from choline only by containing one molecule less of $H_2O$.

Choline.



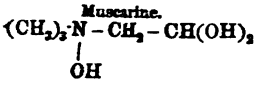
$$(CH_3)_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}CH_2-CH_2{\cdot}OH$$

Betaine.



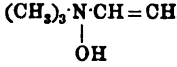
$$(CH_3)_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}CH_2-CO{\cdot}OH\ .$$

Muscarine.



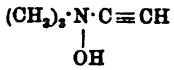
$$(CH_2)_3{\cdot}\underset{\overset{|}{OH}}{N}-CH_2-CH(OH)_2$$

Neurine.



$$(CH_3)_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}CH=CH_2$$

If muscarine is really an aldehyde, the toxic character of that base would appear to be due to the presence of the aldehyde group $-CH_2-COH$, or the group $-CH_2-CH(OH)_2$, since the groups $-CH_2-CH_2{\cdot}OH$ and $-CH_2-CO{\cdot}OH$, in combination with trimethylamine, have no direct poisonous action. In the case of neurine, on the contrary, it is probable that the poisonous action may be connected with the double linking in the vinyl group $-CH=CH_2$. And if that idea be correct it might be expected that a corresponding trimethylamine derivative with a triple linking—an acetenyl trimethylammonium hydroxyd—



$$(CH_3)_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}C\equiv CH$$

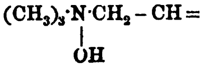
should have a similar or even a stronger toxic action.

In order to test this inference the acetenyl compound has been prepared by one of Professor Schmidt's pupils.[§] Its physiological action has been tried by Professor Hans Meyer, and it proves to be a very powerful poison, acting even more energetically than neurine.

The material taken as the starting point in these experiments was the trimethylamine-ethylene bromide, $Br.N(Me)_3{\cdot}C_2H_4Br.$, obtained by A. W. Hofmann by combining ethylene bromide with trimethylamine. When treated with moist silver oxide both bromine atoms are separated, the one combined with carbon being eliminated as hydrobromic acid, and consequently giving rise to a double linkage of the carbon atoms so as to form trimethyl-vinyl-ammonium hydroxyd or neurine. By the action of bromine upon the bromide of this base the double linkage of the carbon atoms is broken and a compound formed which may be described as dibrom-ethyl-trimethyl ammonium bromide $Br.NMe_3{\cdot}CHBr.-CH_2Br$. By the treatment of this product with alcoholic potash hydrobromic acid is eliminated and the double linkage of the carbon atoms is restored, monobrom-vinyl-trimethyl ammonium bromide $Br.NMe_3CH=CHBr.$ being formed. By further reaction with alcoholic potash hydrobromic acid was again eliminated, resulting in a triple linkage of the carbon atoms and the formation of acetenyl-trimethyl ammonium $OH{\cdot}NMe_3{\cdot}C\equiv CH$, as shown by the following equation:—

$$\left.\begin{matrix}Br.NMe_3{\cdot}CH=Br.\\ 2KHO.\end{matrix}\right\}\quad\left\{\begin{matrix}OH{\cdot}NMe_3{\cdot}C\equiv CH\\ 2KBr+H_2O.\end{matrix}\right.$$

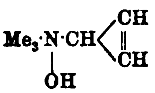
Extending the inquiry as to the physiological action of these compounds it appeared of interest to obtain a knowledge of the homologs of neurine, and in the first instance allyl-trimethyl-ammonium hydroxide, $C_6H_{15}NO$, has been studied by Weiss and Partheil, the constitution of which is shown by the following formula—



$$(CH_3)_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}CH_2-CH=CH_2.$$

This body was prepared by the reaction of allyl chloride $C_3H_5Cl$, with an alcoholic solution of trimethylamine $N(CH_3)_3$, heated together for six hours in a sealed tube. The chloride thus obtained was very hygroscopic, its platinum salt was readily soluble in water, and crystallisable. Contrary to expectation its physiological action was found to be quite different from that of neurine, or of the acetenyl base above mentioned, being in fact a comparatively non-poisonous substance.

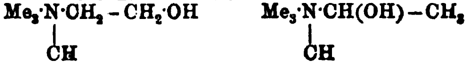
It has not been possible to obtain from this allyl compound a derivative corresponding to acetenyl trimethylammonium hydroxyd. The product obtained had not very marked toxic character, and its probable constitution is represented by the formula:—



$$Me_3{\cdot}\underset{\overset{|}{OH}}{N}{\cdot}CH\left\langle\begin{matrix}CH\\ \|\\ CH\end{matrix}\right.$$

Further investigations of the compounds obtainable by similar reactions are being carried out by Professor Schmidt and his pupils. From the relations existing between the chemical and physiological characters of choline, betaine, and muscarine, it is of interest to ascertain in regard to their physiological action what is the influence exercised by the position and the number of the hydroxyl groups in the derivatives of trimethylamine. This has been attempted in reference to

Choline and Isocholine.



$$Me_3{\cdot}\underset{\overset{|}{CH}}{N}{\cdot}CH_2-CH_2{\cdot}OH \qquad Me_3{\cdot}\underset{\overset{|}{CH}}{N}{\cdot}CH(OH)-CH_3$$

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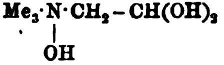
[*] Abstract from papers in the *Annalen der Chemie*, vol. 267.

[†] It may be pointed out that in some books choline and neurine are described as identical, as, for instance, in the last edition of Watts' 'Dictionary of Chemistry,' where choline is described under the heading Neurine (III., 498). In like manner it is stated that neurine is non-poisonous, and that betaine is formed by the oxidation of neurine (I., 507, and III., 498). By a typographical error the formula of muscarine is given as $C_5H_{15}NO_2$ instead of $C_5H_{15}NO_3$ (III., 444).—[Ed. *Pharm. Journ.*].

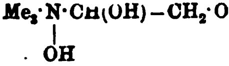
[‡] Schmiedeberg and Harnack, *Archiv f. exp. Path. u. Pharmacol.*, 1877.

[§] J. Bode, *Annalen der Chemie*, 267.

Muscarine and Isomuscarine.



$Me_3 \cdot N \cdot CH_2 - CH(OH)_2$, with OH on N



$Me_3 \cdot N \cdot CH(OH) - CH_2 \cdot OH$, with OH on N

It has not hitherto been possible to obtain isocholine; but the preparation of isomuscarine or oxycholine has not been attended with any great difficulty. It appears from the experiments carried out by Professor Meyer that the physiological effects of this latter body show that the product obtained from choline by the introduction of a hydroxyl group in the $\alpha$ position has a powerful toxic character, but that its action is essentially different from that of muscarine, in which the second hydroxyl group is apparently in the $\beta$ position.

## THE LUMINIFEROUS ETHER.[*]

### BY SIR G. G. STOKES.

I intend to bring before you to-night a subject which the study of light has caused me to think a good deal about. I refer to the nature and properties of the so-called luminiferous ether. This subject is, in one respect, specially fascinating, scientifically considered. It lies, we may say, in an especial manner on the borderland between what is known and what is unknown. In the study of it it is quite conceivable that great discoveries may be made, and, in fact, great discoveries have already been made, and I may say even quite recently, and we do not at present know how much additional light on the system of nature may be in store for the men of science; possibly even in the near future, possibly not until many generations have passed away. I will assume, as what is familiarly known to you all, and what is well established by methods into which I will not enter, that the heavenly bodies are at an immense distance from our earth. More especially is this the case with the fixed stars. Their distance is so enormous that even when we take as a base line, so to speak, the diameter of the earth's orbit, which we know to be about 184 millions of miles, the apparent displacement of the stars due to parallax is so minute as almost to elude our investigation. Nevertheless, that distance is more or less accurately determined in the case of a few of the fixed stars. But the vast majority, as we have every reason to believe, are at such an enormous distance that even this method fails with them.

To give a conception of the immense distance of the fixed stars, I will assume as known that light travels at the rate of about 186,000 miles in one second, a rate which would carry it nearly eight times round and round the earth in that time; and yet if we take the star, which, so far as we know, is our nearest neighbour, it would take three or four years for light from that star to reach the earth. Now as we see the fixed stars there must be some link of connection between us and them in order that we should be able to perceive them. Probably all of you know that two theories have been put forward as to the nature of light, as to the nature accordingly of that connection of which I have spoken. According to one idea, light is a substance darted forth from the luminous body with an amazing velocity; according to the other, it consists in a change of state taking place, propagated through a medium, as it is called, intervening between the body from which the light proceeds and the eye of the observer. For a considerable time the first of these theories was that chiefly adopted by scientific men. It was that, as you know, which Newton himself adopted; and probably the prestige of his name had much to do with the favourable reception which for a long time it received. But more recent researches have so completely established the truth of the other view, and refuted the old doctrine of emissions, that it is now universally held by scientific men that light consists in an undulatory movement propagated in a medium existing in all the space through which light is capable of passing.

This necessity for filling all space, or, at least, such an inconceivably great extent of space, with a medium, the office of which, so far as was known in the first instance, was simply that of propagating light, was an obstacle for a time to the reception by the minds of some of the theory of undulations. Men had been in the habit of regarding the inter-planetary and interstellar space as a vacuum, and it seemed too great an assumption to fill all this supposed vacuous space with some kind of medium for the sole purpose of transmitting light. Notwithstanding, even long ago strong opinions were entertained to the effect that there must be something intervening between the different heavenly bodies. In a letter to Bentley, Newton expresses himself in very strong language to this effect: "That gravity should be innate, inherent, and essential to matter, so that one body may act upon another at a distance through a *vacuum*, without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity that I believe that no man who has in philosophical matters a competent faculty of thinking, can ever fall into it. Gravity must be caused by an agent acting constantly according to certain fixed laws; but whether this agent be material or immaterial I have left to the consideration of my readers.

What the nature of the connection between the earth and the sun, for example, may be whereby the sun is able to attract the earth and thereby keep it in its orbit—in other words, what the cause of gravitation may be—we do not know; for anything we know to the contrary, it may be connected with this intermediate medium or luminiferous ether. There are other offices, we believe, which this luminiferous ether fulfils, to which I shall have occasion to allude presently.

In connection with the necessity for filling such vast regions of space with this medium, a curious question naturally presents itself. We cannot conceive of space as other than infinite, but we habitually think of matter as occupying here or there limited portions of space, as, for example, the different heavenly bodies. The intervening space we commonly think of as a vacuum, and it is only the phenomena of light that led us in the first instance to think of it as filled with some kind of material. The question naturally presents itself to the mind—is this ether absolutely infinite like space? This is a question to which science can give no answer. Though we cannot help thinking of space as infinite, yet when we turn our thoughts to some material existing in space perhaps we more readily think of it as finite than infinite. But if the ether, however vast the portion of space over which it extends, be really limited, we can hardly fail to speculate what there may be outside its limits. Space there might be wholly vacuous, or possibly outside altogether this vast system of stars and ether there may be another system subject to the same laws, or subject to different laws, as the case may be, equally vast in extent; and if there be, then so far as we can gather from such phenomena as are open to our investigation, there can be no communication between that vast portion of space in part of which we live and an ideal system altogether outside the ether of which we have been speaking.

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[*] Presidential address to the Victoria Institute, delivered on June 29. Reprinted from *Nature*.

But the properties of the ether are no less remarkable than its vast or even possibly limitless extent. Matter of which our senses give us any cognisance is heavy, that is to say, it gravitates towards other matter which agrees with it in so far as being accessible to our senses. The question presents itself to the mind, does the ether gravitate towards what we call ponderable matter? This is a question to which we are not able to give any positive scientific answer. If the ether be in some way or other connected with the cause of gravitation, it would seem more likely that it itself does not gravitate towards ponderable matter.

Again, we have very strong reason for believing that ponderable matter consists of ultimate molecules. First, that supposition accords in the simplest way with the laws of crystallography. Chemical laws afford still stronger confirmation of the hypothesis, through the atomic theory of Dalton, now universally accepted. Comparatively recently, the deduction of the fundamental property of gases from the kinetic theory, as it is called, affords strong additional confirmation of that view of the constitution of matter. Still more recently, the explanation which has been afforded by that theory of that most remarkable instrument, the radiometer of Crookes, has lent further confirmation in the same direction. None of these evidences apply to the ether, and accordingly we are left in doubt whether it too consists of ultimate molecules, or whether, on the other hand, it is continuous, as we cannot help conceiving space to be.

The undulatory theory of light was greatly promoted in the first instance by the known phenomena of sound, and the explanation which they received from the hydrodynamical theory. Accordingly, since sound, as we know, consists of an undulatory movement, propagated through the air (or it may be through other media) and depending upon condensation and rarefraction, it was supposed naturally that light was propagated in a similar manner, by virtue of the forces brought into play by the condensation and rarefraction of the ether. But there is one whole class of phenomena which have actually no counterpart in those of sound; I refer to polarisation and double refraction.

The evidence for the truth of the theory of undulations as regards the phenomena of common light depends in great measure upon the fact of interference and the explanation which the theory gives of the complicated phenomena of diffraction. But in studying the interference of polarised light, additional phenomena presented themselves which ultimately pointed out that the vibrations with which we are concerned in the case of the ether differ altogether in their character from those which belong to sound. The phenomena of the interference of polarised light prove incontestably that there exists in light an element of some kind having relation to directions transverse to that of propagation, and admitting of composition and resolution in a plane perpendicular to the direction of transmission according to the very same laws as those of the composition and resolution of forces, or velocities, or displacements in such a plane. This requires us to attribute to the ether a constitution altogether different from that of air. It points out the existence of a sort of elasticity whereby the ether tends to check the gliding of one layer over another. Have we no example of such a force in the case of ponderable matter? We have We know that an elastic solid, which for simplicity I will suppose to be uncrystalline, and alike in all directions, has two kinds of elasticity, by one of which it, like air, tends to resist compression and rarefraction; while by the other it tends to resist a continuous gliding of one portion over another, and to restore itself to its primitive state if such a gliding has taken place. There is no direct relation between the magnitude of these two kinds of elasticity, and in the case of an elastic solid such as jelly the resistance to compression is enormously great compared to the resistance to a gliding displacement.

If we assume that in the ether there is really an elasticity tending to restore it to its primitive condition when one layer tends to glide over another, an elasticity which it appears to be absolutely necessary to admit in order to account for the observed laws of interference of polarised light, the question arises, can we thereby explain double refraction?

The earliest attempts to explain it in accordance with the theory of transverse vibrations were made by attributing to the ether a molecular constitution more or less analogous to that which we believe to exist in ponderable matter. Following out speculations founded upon that view, the celebrated Fresnel was led to the discovery of the actual laws of double refraction; the theory, however, which he gave was by no means complete, inasmuch as the results were not rigorously deduced from the premises. Cauchy and Neumann, independently and about simultaneously, took up Fresnel's view of the constitution of the ether and applied it to explain the laws of double refraction. In their theory the conclusions arrived at were rigorously derived from the premises; but the results did not altogether agree with observation; that is to say, although they could by the adoption of certain suppositions be forced into a near accordance with the observed laws of double refraction, yet they pointed out the necessity of the existence of other phenomena which were belied by observation. Our own countryman Green was the first to deduce Fresnel's laws from a rigorous dynamical theory, although nearly simultaneously MacCullagh arrived at a theory in some respects similar, though on the whole I think less satisfactory.

Still, all these theories followed pretty closely the analogy of ponderable matter; and at least in the first three mentioned the ether was even imagined to consist of discrete molecules, acting on one another, like the bodies of the solar system regarded as points, by forces in the direction of the joining line, and varying as some function of the distance. I have already quoted the very strong language in which Newton rejected the idea of the heavenly bodies acting on one another across the intervening spaces, which were absolutely void. But the conception has nothing to do with the magnitude of the intervening spaces, and the conception of action at a distance across an intervening space which is absolutely void, is not a bit easier when the space in question is merely that separating two adjacent molecules, when the ether is thought of as consisting of discrete molecules, than it is when the space is that separating two bodies of the solar system, though in this latter case it may amount to many millions of miles. If the ether be in some unknown manner the link of connection whereby two heavenly bodies are enabled to exert on one another the attraction of gravitation, then according to the hypothetical constitution of the ether that we have been considering, we seem compelled to invent an ether of the second order, so to speak, to form a link of connection between two separate molecules of the luminiferous ether. But since the nature of the ether is so very different as it must be from that of ponderable matter, it may be that the true theory must proceed upon lines in which our previous conceptions derived from the study of ponderable matter are in great measure departed from.

If we think of the ether as a sort of gigantic jelly, we can hardly imagine but that it would more or less resist the passage of the heavenly bodies—the planets for instance—through it. Yet there appears to be no certain indication of any such resistance. It has been observed, indeed, in the case of Encke's comet, that at successive revolutions the comet returned to its perihelion a little before the calculated time. This would be accounted for by the supposition that it experienced a certain amount of resistance from the ether. Although at first sight we might be disposed to say that such a resistance would retard perihelion passage, yet the fact that it would accelerate it becomes easily intelligible, if we consider that the resistance experienced would tend to check its motion, and so prevent it from getting away so far from the sun at aphelion, and would consequently bring it more nearly into the condition of a planet circulating round the sun in a smaller orbit.

Many years ago I asked the highest authority in this country on physical astronomy, the late Professor Adams, what he thought of the evidence afforded by Encke's comet for the existence of a retarding force, such as might arise from the ether. He said to me that he thought we did not know enough as to whether there might not possibly be a planet or planets within the orbit of Mercury which would account for it in a different way. But quite independently of such a supposition it is worthy of note that the remarkable phenomena presented by the tails of comets render it by no means unlikely that even without the presence of a resisting medium, and without the disturbing force arising from the attraction of an unknown planet, situated so near to the sun as not to have been seen hitherto, the motion of the head of a comet might not be quite the same as that of a simple body representing the nucleus, and being subject to the gravitation of the sun and planets and nothing else. It appears that the tails consist of some kind of matter driven from the comet with an enormous velocity by a sort of repulsion emanating from the sun. If the nucleus loses in this manner at each perihelion passage an exceedingly small portion of its mass, which is repelled from the sun, it is possible that the residue may experience an attraction towards the sun over and above that due to gravitation, and that possibly this may be the cause of the observed acceleration in the time of passing perihelion even though there be no resistance on the part of the ether. So that the question of resistance or no resistance must be left an open one.

The supposition that the ether would resist in this manner a body moving through it is derived from what we observe in the case of solids moving through fluids, liquid or gaseous, as the case may be. In ordinary cases of resistance, the main representative of the work apparently lost in propelling the solid is, in the first instance, the molecular kinetic energy of the trail of eddies in the wake. The formation of these eddies is, however, an indirect effect of the internal friction or, if we prefer the term, viscosity of the fluid. Now, the viscosity of gases has been explained on the kinetic theory of gases, and in the case of a liquid we cannot well doubt that it is connected with the constitution of the substance as not being absolutely continuous but molecular. But if the ether be either non-molecular, or molecular in some totally different sense from ponderable matter, we cannot with safety infer that the motion of a solid through it necessarily implies resistance.

The luminiferous ether touches on another mysterious agent, the nature of which is unknown, although its laws are in many respects known, and it is applied to the every-day wants of life, and its applications are even regulated by Acts of Parliament; I allude to electricity. I said that the nature of electricity is unknown. More than forty years ago I was sitting at dinner beside the illustrious Faraday, and I said to him that I thought a great step would have been made if we could say of electricity something analogous to what we say of light, when we affirm that light consists of undulations; and he said to me that he thought we were a long way off that at present. But, as I said, relations have recently been discovered between light and electricity, which lead us to believe that the latter is most closely connected with the luminiferous ether.

Clerk-Maxwell showed that the ratio of two electrical constants which are capable of being determined by laboratory experiments, and which are of such a nature that that ratio expresses a velocity, agrees with remarkable accuracy with the known velocity of light. This formed the starting-point of the electro-magnetic theory of light which is so closely associated with the name of Maxwell.

According to this idea, light may be looked on as the propagation of an electro-magnetic disturbance, whatever the appropriate idea of such a thing may actually be. The theory has quite recently received remarkable confirmation by the investigations of Hertz, who has shown that what are incontestably electro-magnetic disturbances, and are investigated by purely electrical means, exhibit some of the fundamental phenomena of light, such, for example, as interference and polarisation. It appears that these electro-magnetic waves are strictly of a similar nature to the waves of light, though there is an enormous difference in the scale of wave-lengths, which in the case of light range about the $\frac{1}{50000}$th part of an inch, while the electro-magnetic waves which have been investigated by purely electrical methods range from a few inches to many yards.

I have ventured to bring this interesting subject before you in the course of the address which I have just delivered. I have not attempted to lay before you the evidence on which scientific men rely for the truth of the conclusions which I have mentioned as well established. That would have required, not merely an evening address, but a whole course of lectures. Neither have I made any allusion to possible bearings of the scientific conclusions on questions relating to religious beliefs. Anything of that kind I leave to your own minds; my object has been simply to present to you very briefly the conclusions of science in that limited branch which I have selected, distinguishing as impartially as I could what is well established from what is debateable or even merely conjectural.

## FERMENT OF THE PINEAPPLE.

Mr. R. H. Chittenden has a paper in the *Transactions* of the Connecticut Academy of Arts and Sciences (1893, p. 281) in which he states that the ripe pineapple contains a very powerful proteid-digesting principle, and that the juice also possesses in a remarkable degree the power of curdling milk. The juice appears to contain three distinct proteids; two of these are separable from the acid juice by heat alone, one at about 75° C., the other at 100°, while the third is not coagulable by heat, but is precipitated by acetic acid and potassium ferrocyanide. The proteid-digesting power of the juice is manifested in fluids of all reactions, acid, alkaline, and neutral, the ferment being in this respect a trypsin rather than a pepsin; it acts, however, most strongly in a neutral solution. The proteolytic ferment may be separated from pineapple juice by saturation of the neutralised fluid by sodium chloride or magnesium sulphate, the former being the preferable method. It appears to be a mixture of a globulin and a proteose.

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, AUGUST 12, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## DEPARTMENT OF SCIENCE AND ART.

THE fortieth annual report of this department has just been published as a blue book, and gives full information as to the operations of the department during the past year. It is shown that there was an increase in 1892, over the preceding year, of 389 separate institutions in which science was taught, whilst in the number of classes in different branches of science there was an increase of 1784, and in the number of pupils under instruction of 32,002. The very large increase appears to be due to the stimulus given by the Technical Instruction Act and the Local Taxation (Customs and Excise) Act. Of the 180,410 pupils under instruction in 1892, 174,949 came within the category of those on account of whose instruction payments on the results of examinations are made by the department, and the payments on results to science schools amounted altogether to £123,647 19*s.* 1*d.*, or £21,466 5*s.* 11*d.* more than in 1891.

The examiners in chemistry, Professor T. E. THORPE, F.R.S., W. A. TILDEN, F.R.S., and W. N. HARTLEY, F.R.S., have reviewed 34,000 papers in theoretical and practical chemistry (inorganic and organic). They find the work of candidates in the advanced stage less satisfactory than in the elementary stage, and attribute this to the want of systematic teaching adapted to the requirements of the former class. In regard to the analytical part of the practical inorganic chemistry, they consider that the methods in use are commonly very unsatisfactory, being unsuited for development into complete schemes of analysis. It is observed that these methods are not general methods, and some of the individual tests chosen are themselves imperfect, whilst the practice followed, of applying confirmatory tests to the original substance or solution, is obviously illegitimate, unless due regard be paid to the possible and probable interference of constituents other than the one whose presence is to be confirmed. Throughout the whole of the examination it is said to be manifest that great advantage would arise to the student if more frequent opportunities were afforded by teachers for practice in writing out answers to questions, and statements of the results of analytical work done by the students. In the case of many schools there was evidence of much cramming, answers to expected questions having evidently been learned by rote, and the vicious practice of getting up equations in the same way, without any understanding of their meaning, was obviously rife.

This report is hardly likely to afford much satisfaction to those who have at heart the cause of education in chemistry, as a practical science, nor does it bear out the statement in the *Standard* of the 10th inst., that the "department seems to have outlived alike the exaggerated expectations with which it started, and the excessive depreciation which subsequently came upon it," for the depreciation should more fairly be regarded as actual than excessive in view of the facts indicated in the examiners' comments. The fact is that state-aided instruction in science is a practical failure in this country, where little that is really good and lasting results in any department of activity except when based on individual endeavour, and the only bearing on the ultimate result of the stimulus given by the Technical Instruction Act will probably be to enhance the ill effects that must be produced by the continuance of a system that is evil in itself.

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## THE MEDICINE STAMP ACTS.

The reference to "Mr. Milner's invitation" in the letter addressed to the Council from the Nottingham and Notts Chemists' Association may lead to some misconception, especially if taken in connection with the statement which has been made in a Nottingham paper that the late Chairman of the Board of Inland Revenue invited the Council of the Pharmaceutical Society to advise on the amendment of the Medicine Stamp Act. It is probable that the communications between the Board of Inland Revenue and the Chemists' and Druggists' Trade Association in 1886 are referred to; but on reference to the report of the conference with the late Chairman and other members of the Board (see *Pharm. Journ.*, [3], xvi., 907) it will be seen that on that occasion no invitation was given to advise on the amendment of the Act. An offer was then made to assist the Trade Association in making chemists and druggists acquainted with the requirements of the Medicine Stamp Act, and a memorandum drawn up for that purpose was subsequently issued with the approval of the Commissioners (see *Pharm. Journ.*, [3], xvii., 598).

## MEDICAL MEN AND LIMITED COMPANIES.

The *Times* of Wednesday last devotes a powerful leader to a case of the very highest importance as bearing upon the relations that should exist between medical practitioners and their patients. It appears that about a year ago a company was formed to take over the business of some manufacturers of medicated wine, and certain shares in the company, of the nominal value of £25 each, were classified as "founders' shares." Negotiations were entered into by the secretary of the company with a number of medical men, who were induced to prescribe and recommend the company's goods to patients and tradesmen, on condition that each one received gratis a fully paid-up founders' share. The shares were signed and sealed by the directors in due course and the names of the allottees inserted by the secretary, who then despatched the certificates to the doctors. Unfortunately, the company was compelled, almost directly after its formation, to go into voluntary liquidation, and the liquidator demanded from the aforesaid medical men a payment on their shares. This claim they combined to resist, and Mr. Justice Vaughan Williams has given the case in their favour, on the ground that their agreement had been to accept fully paid-up shares, and that they must accordingly be treated as such.

In giving judgment, however, the Judge added a strong expression of opinion on the moral points involved. He said "it was a sad thing that members of a learned profession should have consented to take shares on such terms. It might be that the individual doctors thought well of the wares of this company, and that in praising them they acted as their consciences dictated, but to take shares in consideration of praising the wares of the company was very like taking them as bribes." Further, he added that, if he could legally have made the defendants in the action pay, he would have been very glad to do so.

Commenting on the case, our contemporary remarks that the essence of the relations between a doctor and his patient is that they should be confidential, and that the latter, in return for his fee, should be satisfied that his medical attendant will do his best for him and prescribe for him without reference to any profit that may be made out of what is prescribed. The leader writer then proceeds to criticise, in no measured terms, the action of the defendants in the present case, and ventures the opinion that it is one in which the interference of the medical authorities is eminently called for. The Medical Council, the College of Physicians, the College of Surgeons, the Society of Apothecaries, and the various cognate bodies, are indicated as possessing many privileges for which, in return, it is their duty to maintain the honour of a great profession, and the hope is expressed that, without loss of time, they will take steps to discover the identity of these assumed delinquents, which has so far been suppressed.

## BRITISH PHARMACEUTICAL CONFERENCE.

The following is the additional list of papers to be read at the meeting of the Conference next week:—

14. Lithium Salts, by H. Bowden.
15. African Copaiba, by J. C. Umney, F.C.S.
16. The Estimation of the Diastasic Action on Starch, by D. B. Dott, F.R.S.E.
17. A Cheap and Useful Form of Apparatus for the Gravimetric Determination of $CO_2$, by J. H. Hoseason.
18. The Ipecacuanhas of English Commerce, by E. M. Holmes, F.L.S.

## MAP OF NOTTINGHAM.

We have received from the publishers, Messrs. Stevenson, Bailey and Smith, of Nottingham, particulars of a map of that town, which should prove useful to visitors to the Conference and British Association meetings. It serves as a useful guide to the various places of interest in the town, since it contains in convenient book form a complete alphabetical list of streets, roads, etc., with indications of their position on the map.

## A NEW HYPNOTIC.

In the *British Medical Journal* of July 29, a case of poisoning was reported, which was attributed to chloralose, but since the patient was also shown to have taken some syrup of chloral it is probable that the symptoms observed were due to the latter, and, by suitable treatment, the patient recovered. Chloralose, or anhydro-gluco-chloral, was discovered by MM. Hanriot and Richet (see *Pharm. Journ.*, xxiii., 609). It is a somewhat difficult compound to prepare, and should be free from chloral and para-chloralose, an isomeric compound. As prepared by Messrs. Bain and Fournier, of Paris, whose London agents, Messrs. Arthur and Co., have submitted specimens to us, it occurs as a fine white crystalline powder. Being only slightly soluble in cold water, and its solution in hot water being very bitter, it is best administered in cachets containing three grains each. The formula of the compound, first given as $C_8H_{11}Cl_3O_6$, is now stated to be $C_8H_{11}ClO_6$.

## RECENT SCIENCE.

In an interesting paper in the *Nineteenth Century* for August, Prince Kropotkin deals with recent speculations as to the structure of the chemical molecule, especially as exemplified in complex organic compounds, and shows how, under the unitarian system—according to which each atom is considered as distinct rather than as constituting a member of one of two groups—the conceptions of modern chemistry have been widened, and a powerful impulse given to research. The manner in which from the relatively simple compound marsh-gas, by successive substitutions, increasingly complex organic bodies can be formed is referred to, and it is shown that the student who has grasped the theory of substitutions grasps at once the structure, origin, and classification of the most complex combinations, as at present understood. Isomerism and stereo-chemistry are also briefly explained in a simple way, and students of organic chemistry will find the article well worthy of perusal.

## THE SALE OF GANJA AND ALLIED DRUGS.

We have received from the Finance and Commerce Department of the Government of India a copy of a resolution concerning the appointment of a commission to inquire into the cultivation of the hemp plant and the use of hemp drugs in India (see *ante*, p. 26). The commission is to ascertain the extent to which the hemp plant is cultivated in each of the provinces of India in which it is grown, and collect full information as to the manner in which it is cultivated for the production of drugs and the methods of preparing the manufactured drug from the raw product. Full particulars are also to be obtained regarding the different forms of the drug in common use, ganja, charas, bhang, etc., and regarding the classes of the people by whom each is used, as well as the extent to which they use them, whilst the physical and other effects of their employment are to be thoroughly investigated, the evidence of medical experts being taken on the latter points.

## ORIGIN OF ATMOSPHERIC OXYGEN.

Dr. T. L. Phipson, who has devoted a considerable amount of attention to problems concerning the constitution of the atmosphere, is led to the conclusion that the original atmosphere of the globe consisted of nitrogen alone, and that the oxygen now present is the product of vegetable life. In a paper in the *Chemical News* he states that minute microscopic plants (*Protococcus pluvialis* and *P. palustris*) can be easily transformed into manufacturers of oxygen gas. As the result of experiments, some of which were recently referred to (see *ante*, p. 83), he concludes that plants absorb carbonic acid by the roots, and secrete oxygen by the leaves, from which it is subsequently given off. Into the primitive atmosphere of nitrogen, the early vegetation would thus pour oxygen during countless years until its composition became practically what it now is.

## THE SPECTROSCOPE IN CHOLERA.

According to a correspondent of the *Medical Press*, Professors Emmerich and Tsuboi find that small doses of sodium nitrite (0·3 to 1·0 gramme) will produce vomiting, diarrhœa, rise of temperature, and muscular spasms, followed by death within an hour or two, in guinea-pigs, rabbits, and dogs. The dark blood in such cases has the characteristic methæmoglobin line between C and D, when viewed by the spectroscope. Similar results have not yet been proved to occur in man, but it is claimed to be established that nitrous poisoning is the cause of death in guinea-pigs when produced by the cholera bacillus. If the bacillus has lost the power of forming nitrites, cholera symptoms will not appear, although the characteristic microbes may be found in the bowel. The results of the experiments are said to indicate that water containing nitrates, and salads and fruits rich in similar compounds, should be avoided, as constituting the sources whence the cholera bacillus can best produce the toxic agent, methæmoglobin. If these results, which are disputed by Dr. G. Klemperer, be confirmed, it would seem that the spectroscope may henceforth play an important part in the diagnosis of cholera.

# Proceedings of Societies in London.

## ROYAL INSTITUTION.

### TURACIN, A REMARKABLE ANIMAL PIGMENT CONTAINING COPPER.*

BY PROFESSOR A. H. CHURCH, M.A., F.R.S., M.R.I.

The study of natural colouring matters is at once peculiarly fascinating and peculiarly difficult. The nature of the colouring matters in animals and plants, and even in some minerals (ruby, sapphire, emerald and amethyst, for example) is still, in the majority of cases, not completely fathomed.

Animal pigments are generally less easily extracted and are more complex than those of plants. They appear invariably to contain nitrogen—an observation in accord with the comparative richness in that element of animal cells and their contents. Then, too, much of the coloration of animals, being due to microscopic structure, and therefore having a mechanical and not a pigmentary origin, differs essentially from the coloration of plants. Those animal colours which are primarily due to structure do, however, involve the presence of a dark pigment—brown or black—which acts at once as a foil and as an absorbent of those incident rays which are not reflected.

Many spectroscopic examinations of animal pigments have been made. Except in the case of blood- and bile-pigments, very few have been submitted to exhaustive chemical study. Spectral analysis, when uncontrolled by chemical, and when the influence of the solvent employed is not taken into account, is very likely to mislead the investigator. And, unfortunately, the non-crystalline character of many animal pigments, and the difficulty of purifying them by means of the formation of salts and of separations by the use of appropriate solvents, oppose serious obstacles to elucidation. Of blood-red or hæmoglobin it cannot be said that we know the centesimal composition, much less the molecular weight. Even of hæmatin the empirical formula has not yet been firmly established. The group of black and brown pigments to which the various melanins belong still awaits adequate investigation. We know they contain nitrogen (8½ to 13 per cent.), and sometimes iron, but the analytical results do not warrant the suggestion of empirical formulæ for them. The more nearly they appear to approach purity the freer the majority of them seem from any fixed constituent such as iron or other metal. It is to be regretted that Dr. Krukenberg, to whom we are indebted for much valuable work on several pigments extracted from feathers, has not submitted the interesting substances he has described to quantitative chemical analysis.

I must not, however, dwell further upon these preliminary matters. I have introduced them mainly in order to indicate how little precise information has yet been gathered as to the constitution of the greater number of animal pigments, and how difficult is their study.

And now let me draw your attention to a pigment which I had the good fortune to discover, and to the investigation of which I have devoted I am afraid to say how many years.

It was so long ago as the year 1866 that the solubility in water of the red colouring matter in the wing-feathers of a *plantain-eater* was pointed out to me. [One of these feathers, freed from grease, was shown to yield its pigment to pure water.] I soon found that alkaline liquids were more effective solvents than pure water, and that the pigment could be precipitated from its solution by the addition of an acid. [The pigment was extracted from a feather by very dilute ammonia, and then precipitated by adding excess of hydrochloric acid.] The next step was to filter off the separated colouring matter, and to wash and dry it. The processes of washing and drying are tedious and cannot be shown in a lecture. But the product obtained was a solid of a dark crimson hue, non-crystalline, and having a purple semi-metallic lustre. I named it *turacin* (in a paper published in a now long-defunct periodical, 'The Student and Intellectual Observer,' of April, 1868). The name was taken from "*Touraco*," the appellation by which the *plantain-eaters* are known—the most extensive genus of this family of birds being *Turacus*.

From the striking resemblance between the colour of arterial blood and that of the red touraco feathers, I was led to compare their spectra. Two similar absorption bands were present in both cases, but their positions and intensities differed somewhat. Naturally I sought for iron in my new pigment. I burnt a portion, dissolved the ash in hydrochloric acid, and then added sodium acetate and potassium ferrocyanide. To my astonishment I got a precipitate, not of Prussian blue, but of Prussian brown. This indication of the presence of copper in turacin was confirmed by many tests, the metal itself being also obtained by electrolysis. It was obvious that the proportion of copper present in the pigment was very considerable—greatly in excess of that of the iron (less than ·5 per cent.) in the pigment of blood.

Thus far two striking peculiarities of the pigment had been revealed, namely, its easy removal from the web of the feather, and the presence in it of a notable quantity of copper. Both facts remain unique in the history of animal pigments. The solubility was readily admitted on all hands; not so the presence of copper. It was suggested that it was derived from the Bunsen burner used in the incineration, or from some preservative solution applied to the bird-skins. And it was asked "How did the copper get into the feathers?" The doubters might have satisfied themselves as to copper being normally and invariably present by applying a few easy tests, and by the expenditure of half-a-crown in acquiring a touraco wing. My results were, however, confirmed (in 1872) by several independent observers, including Mr. W. Crookes, Dr. Gladstone, and Mr. Greville Williams. And in 1873 Mr. Henry Bassett, at the request of the late Mr. J. J. Monteiro, pushed the inquiry somewhat further. I quote from Monteiro's 'Angola and the River Congo,' published in 1875 (vol. ii., pp. 75-77). "I purchased a large bunch of the red wing-feathers in the market at Sierra Leone, with which Mr. H. Bassett has verified Professor Church's results conclusively," &c., &c. Mr. Bassett's results were published in the *Chemical News* in 1873, three years after the appearance of my research in the *Phil. Trans.* As concentrated hydrochloric acid removes no copper from turacin, even on boiling, the metal present could not have been a mere casual impurity; as the proportion is constant in the turacin obtained from different species of touraco, the existence of a single definite compound is indicated. The presence of traces of copper in a very large number of plants as well as of animals has been incontestably established. And, as I pointed out in 1868, copper can be readily detected in the ash of banana fruits, the favourite food of several species of the "turacin-bearers." The feathers of a single bird contain on the average two grains of turacin, corresponding to ·14 of a grain of metallic copper; or, putting the amount of pigment present at its highest, just one-fifth of a grain. This is not a large amount to be furnished by its food to one of these birds once annually during the season of renewal of its feathers. I am bound, however, to say that in the blood and tissues of one of these birds, which I analysed immediately after death, I could not detect more than faint traces of copper. The particular specimen examined was in full plumage. I conclude that the copper in its food, not being then wanted, was not assimilated.

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* Lecture delivered on Friday, February 17, 1893.

Let us now look a little more closely at these curious birds themselves. Their nearest allies are the cuckoos, with which they were formerly united by systematists. It has, however, been long conceded that they constitute a family of equal rank with the Cuculidæ. According to the classification adopted in the Natural History Museum, the order Picariæ contains eight sub-orders, the last of which, the Coccyges, consists of two families, the Cuculidæ and the Musophagidæ. To the same order belong the Hoopoes, the Trogons, the Wood-peckers. The plantain-eaters or Musophagidæ are arranged in six genera and comprise twenty-five species. In three genera—Turacus, Gallirex, and Musophaga—comprising eighteen species, and following one another in zoological sequence, turacin occurs; from three genera (seven species)—Corythæola, Schizorhis, and Gymnoschizorhis—the pigment is absent. [The coloured illustrations to H. Schlegel's Monograph (Amsterdam, 1860) on the Musophagidæ were exhibited]. The family is confined to Africa: eight of the turacin-bearers are found in the west sub-region, one in the south-west, two in the south, two in the south-east, four in the east, two in the central, and two in the north-east. It is noteworthy that in all these sub-regions save the south-east, turacin-bearers are found along with those plantain-eaters which do not contain the pigment. Oddly enough, two of the latter species, *Schizorhis africana* and *S. zonura*, possess white patches destitute of pigment in those parts of the feathers which in the turacin-bearers are crimson. These birds do not, I will not say cannot, decorate these bare patches with this curiously complex pigment. [Some extracts were here given from the late Mr. Monteiro's book on Angola, vol. ii., pp. 74-79, and from letters by Dr. B. Hinde. These extracts contained references to curious traits of the touracos.]

Usually from twelve to eighteen of the primaries or metacarpo-digitals and secondaries or cubitals amongst the wing feathers of the turacin-bearers have the crimson patches in their web. Occasionally the crimson patches are limited to six or seven of the eleven primaries. I have observed this particularly with the violet plantain-eater (*Musophaga violacea*). In these cases the crimson head-feathers, which also owe their colour to turacin, are few in number, as if the bird, otherwise healthy, had been unable to manufacture a sufficiency of the pigment. I may here add that the red tips of the crest feathers of *Turacus meriani* also contain turacin.

In all the birds in which turacin occurs, this pigment is strictly confined to the red parts of the web, and is there unaccompanied by any other colouring matter. It is therefore found that if a single barb from a feather be analysed, its black base and its black termination possess no copper, while the intermediate portion gives the blue-green flash of copper when incinerated in the Bunsen flame. [A particoloured feather was burnt in the Bunsen flame, with the result indicated.]

Where it occurs, turacin is homogeneously distributed in the barbs, barbicels, and crochets of the web, and is not found in granules or corpuscles.

To the natural question, "Does turacin occur in any other birds besides the touracos?" a negative answer must at present be given. At least my search for this pigment in scores of birds more or less nearly related to the Musophagidæ has met with no success. In some of the plantain-eaters (species of Turacus and Gallirex) there is, however, a second pigment closely related to turacin. It is of a dull grass-green colour, and was named Turacoverdin by Dr. Krukenberg in 1881. I had obtained this pigment in 1868 by boiling turacin with a solution of caustic soda, and had figured its characteristic absorption band in my first paper (*Phil. Trans.*, vol. clix., 1870, p. 630, fig. 4). My product was, however, mixed with unaltered turacin. But Dr. Krukenberg obtained what certainly seems to be the same pigment from the green feathers of *Turacus corythaix*, by treating them with a 2 per cent. solution of caustic soda. I find, however, that a solution of this strength dissolves, even in the cold, not only a brown pigment associated with turacoverdin, but ultimately the whole substance of the web. By using a much weaker solution of alkali (1 part to 1000 of water) a far better result is obtained. [The characteristic absorption band of turacoverdin, which lies on the less refrangible side of D, was shown; also the absorption bands of various preparations of turacin.] I have refrained from the further investigation of turacoverdin, hoping that Dr. Krukenberg would complete his study of it. At present I can only express my opinion that it is identical with the green pigment into which turacin when moist is converted by long exposure to the air or by ebullition with soda, and which seems to be present in traces in all preparations of *isolated* turacin however carefully prepared.

A few observations may now be introduced on the physical and chemical characters of turacin. It is a colloid of colloids. And it enjoys in a high degree one of the peculiar properties of colloids, that of retaining, when freshly precipitated, an immense proportion of water. Consequently, when its solution in ammonia is precipitated by an acid, the coagulum formed is very voluminous. [The experiment was shown.] One gramme of turacin is capable of forming a semi-solid mass with 600 grammes of water. Another character which turacin shares with many other colloids is its solubility in pure water and its insolubility in the presence of mere traces of saline matter. It would be tedious to enumerate all the observed properties of turacin, but its deportment on being heated and the action of sulphuric acid upon it demand particular attention.

At 100° C., and at considerably higher temperatures, turacin suffers no change. When, however, it is heated to the boiling-point of mercury it is wholly altered. No vapours are evolved, but the substance becomes black and is no longer soluble in alkaline liquids, nor, when still more strongly heated afterwards, can it be made to yield the purple vapours which unchanged turacin gives off under the same circumstances. This peculiarity of turacin caused great difficulty in its analysis, for these purple vapours contain an organic crystalline compound in which both nitrogen and copper are present, and which resist further decomposition by heat. [Turacin was so heated as to show its purple vapours, and also the green flame with which they burn.] This production of a volatile organic compound of copper is perhaps comparable with the formation of nickel- and ferro-carbonyl.

The action of concentrated sulphuric acid upon turacin presents some remarkable features. The pigment dissolves with a fine crimson colour, and yields a new compound, the spectrum of which presents a very close resemblance to that of hæmatoporphyrin [turacin was dissolved in oil of vitriol: the spectrum of an ammoniacal solution of the turacoporphyrin thus produced was also shown], the product obtained by the same treatment from hæmatin: in other respects also this new derivative of turacin, which I call turacoporphyrin, reminds one of hæmatoporphyrin. But, unlike this derivative of hæmatin, it seems to retain some of its metallic constituent. The analogy between the two bodies cannot be very close, for if they were so nearly related as might be argued from the spectral observations, hæmatin ought to contain not more but less metal than is found to be present therein.

The percentage composition of turacin is probably—carbon 53·69, hydrogen 4·6, copper 7·01, nitrogen 6·96, and oxygen 27·74. These numbers correspond pretty nearly to the empirical formula, $C_{82}H_{81}Cu_2N_9O_{32}$. But I lay no stress upon this expression.

I have before said that copper is very widely distributed in the animal kingdom. Dr. Giunti, of Naples, largely extended (1881) our knowledge on this point. I can hardly doubt that this metal will be found in traces in all animals. But besides turacin only one organic copper compound has been as yet recognised in animals. This is a respiratory, and not a mere decorative, pigment like turacin. Léon Fredericq discovered this substance, called hæmocyanin. It has been observed in several genera of Crustacea, Arachnida, Gastropoda, and Cephalopoda. I do not think it has ever been obtained in a state of purity, and I cannot accept for it the fantastic formula—$C_{867}H_{1363}CuS_4O_{258}$—which has recently been assigned to it. On the other hand, I do not sympathise with the doubts as to its nature which F. Heim has recently formulated in the *Comptes rendus*.

It is noteworthy, in connection with the periodic law, that all the essential elements of animal and vegetable organic compounds have rather low atomic weights, iron, manganese and copper representing the superior limit. Perhaps natural organic compounds containing manganese will some day be isolated, but at present such bodies are limited to a few containing iron, and to two, hæmocyanin and turacin, of which copper forms an essential part.

If I have not yet unravelled the whole mystery of the occurrence and properties of this strange pigment, it must be remembered that it is very rare and costly, and withal difficult to prepare in a state of assured purity. It belongs, moreover, to a class of bodies which my late master, Dr. A. W. von Hofmann, quaintly designated as "dirts" (a magnificent dirt truly!)—substances which refuse to crystallise and cannot be distilled. I have experienced likewise, during the course of this investigation, frequent reminders of another definition propounded by the same great chemist, when he described organic research as "a more or less circuitous route to the sink"!

I am very glad to have had the opportunity of sharing with an audience in this Institution the few glimpses I have caught from time to time during the progress of a tedious and still incomplete research into the nature of a pigment which presents physiological and chemical problems of high if not of unique interest.

Let my last word be a word of thanks. I am indebted to several friends for aid in this investigation, and particularly to Dr. MacMunn, of Wolverhampton, the recognised expert in the spectroscopy of animal pigments.

# Provincial Transactions.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

At a meeting of the Council of this Association the following communications from local secretaries of the Pharmaceutical Society, being a second list of criticisms and replies on the subject of "territorial representation" (see *Pharm. Journ.*, April 15, p. 860), were submitted by the president, Mr. Charles Thompson.

From Mr. ALEXANDER BOTTLE, Local Secretary at Dover.

"I fully agree with your concluding remarks that more life and energy are wanted in the ranks of pharmacy, and that the Pharmaceutical Society is heavily handicapped in its progress by the fact that far too many of its members fail to recognise their privileges, responsibilities, and duties. I have, however, no belief or confidence in the proposed 'territorial representation' as a panacea for this manifest want of energy, zeal, and enthusiasm, and I may say personally that as a member of the Council I much prefer to feel and know that I am a joint representative custodian of the interests of the pharmacists of Great Britain, and have from time to time to seek at the hands of the entire body their approval rather than accept office as the nominee and representative of a county council. I am not disheartened with the slow progress of the Society, but hopeful that the noble and good work of the past will be more than rivalled by the increased energy, activity, and unaniminity which, I venture to predict, will pervade the new arterial blood of a coming generation."

From Mr. A. G. SURFLEET, Local Secretary at Gainsborough.

"I approve of your idea of 'territorial representation' if it can only be made practical. We are in need of something to bring together chemists who do not subscribe to the Pharmaceutical Society, and who do not, or will not, see what the Society does, and could further do, not only for themselves, but for the trade at large, if they would only come forward, state their grievances, and render their share of assistance to the quarter from where help alone can come. Your measure, I think, will help to do this, and has, therefore, my best wishes."

From Mr. G. W. WORFOLK, Local Secretary at Ilkley.

"I think the *personnel* of the Council is as good as we may expect to see. At the same time, the proposed scheme would have my cordial and active support, as I think it would give the general body of members and associates a greater interest in the election of the Council."

From Mr. H. BARTLETT, Local Secretary at Banbury.

"I have read your address with very great pleasure, and if it is possible to carry out your scheme, I have no doubt but what it would be the means of chemists and druggists taking a far greater interest in the Pharmaceutical Society than they do at present."

From Mr. J. G. WALLBRIDGE, Local Secretary at St. Helens.

"I am fully convinced that a great change is wanted with respect to our elections; we have only to look at the scrutineers' reports to notice the lack of interest taken during the last few years in the election of our councillors. It is high time that something was done to draw in the very large majority that remain outside the Society, and I sincerely hope your suggestions may have a favourable outcome before long."

From Mr. G. BAXTER, Local Secretary at Chester.

"I have been of opinion for some time that district representation is very much required. . . . . It seems to me that some such scheme as you suggest, backed up by the Society, would be the means of binding more closely the interests of chemists in various districts with the Pharmaceutical Society."

From Mr. H. H. POLLARD, Local Secretary at Ryde, I. W.

"For many years I have been in favour of the representation of all shades of opinion—not territories—in the Council. . . . All opinions should be voiced, not by accidental agreement, but by direct representation, in the Council. I doubt whether your territorial scheme would accomplish this result. . . . Wherever you carve your districts the majority of the trade will be non-progressive, or, for short, fossil. If you have twenty-one districts you will have one score and one 'fossil' members. Under the present system, by combining with the minority all over the country we may get a small proportion of progressive members on the Council. The defect is that we do not know what the members are until they are safely seated, but this is a matter that could easily be altered."

From Mr. H. W. Seely, Local Secretary at Halifax.

"Respecting 'territorial representation,' I heartily agree with you."

From Mr. H. W. Kemp, Local Secretary at Horncastle.

"I write to express my cordial agreement with 'territorial representation' as raised by you. If the country were divided into districts of moderate size, it follows that the representative of each district would be fairly well known to chemists of that district, and consequently his hands would be strengthened, resulting in a great advantage to the interest given to the Pharmaceutical Society."

From Mr. Thos. B. Groves, Local Secretary at Weymouth.

"I fail to see what advantage would be gained by the territorial representation you advocate. There is but one variety of first class chemist all the kingdom over, and to these I should prefer entrusting my interests rather than to others. The idea of using the Pharmaceutical Society for the purpose of benefiting 'the trade' is a mistaken one. Parliament is not at all likely to listen to proposals having that object; if it did, what would be the result? A rush of individuals into pharmacy, neutralising quickly any temporary advantage. The statutory powers we at present possess would, if used to the full, seem to be sufficient for all the protection we are ever likely to get. Supposing your scheme had been in operation twenty years ago, when Stoddart, Giles, and Schacht were living, not in one district, but in one city, the services of two of these able pharmacists must have been lost to the Society. The men who at present represent us are not likely, I think, to fail in taking a comprehensive view of the trade as a somewhat complex whole."

From Mr. G. Chalmers, Local Secretary at Huntly.

"I do think the proposed scheme would encourage registered members to connect themselves with the Society, and thus strengthen the bond of union which ought to exist. Only by this means can we look forward hopefully to our status being raised and the commonweal advanced."

From Mr. E. P. Wynne, Local Secretary at Aberystwith.

"Personally I agree with your scheme, especially if it will be the means of creating a little more interest amongst chemists in things pertaining to the good of the trade."

From Mr. Alexander Davidson, Local Secretary at Montrose.

"I am strongly of opinion that if the country were divided into districts, each district returning its own member to the Council—one member or associate one vote—the interest in the Society would be greatly increased."

From Mr. George Wright, Local Secretary at Burton-on-Trent.

"I think your scheme a very good one, and it might cause the general body of chemists to take more interest in the Society."

From Mr. John Averill, Local Secretary at Stafford.

"I am of opinion that territorial representation would be an advantage if the districts were arranged so that the representatives could more easily become acquainted with the views of their constituents."

From Mr. Joseph Sowray, Local Secretary at York.

"My opinion is that we have on the Council of the Pharmaceutical Society at the present time a very able body of men, who are anxious to be of service to the whole of the trade in all parts of England. If any particular district is desirous of having a representative, that district has only to nominate a gentleman at the next election, and I have no doubt he will receive the same courtesy and attention as any of the rest."

From Mr. Allwood Simpson, Local Secretary at Stalybridge.

"I am decidedly in favour of territorial representation. I am sure it would bring about a better, more active, and therefore more real state of things. Candidates would be brought into closer contact with their constituents, constituents would value their vote more, and be at more trouble to record it."

From Mr. John Turner, Local Secretary at Aylesbury.

"I believe in territorial and majority representation in everything, pharmacy included; consequently, I am in favour of your proposal. I should like to see the Pharmaceutical Society strong and thoroughly representative of all branches of the trade, which only a large accession to its membership can accomplish."

From Mr. Marshall Heanley, Local Secretary at Peterborough.

"If I felt your proposed system of territorial representation would cause more to join the Society, I should wish and gladly help to have it adopted; for the present, however, I must say I do not think a change necessary."

From Mr. A. B. Cortis, Local Secretary at Worthing.

"I beg to say I am in favour of the scheme of territorial representation."

From Mr. F. J. Gibson, Local Secretary at Wolverhampton.

"In reply to yours in reference to your suggestion of territorial representation, I think very highly of it."

From Mr. Alexander Strachan, Local Secretary at Aberdeen.

"I beg to say that Mr. Grose, of Swansea, expresses exactly my sentiments as regards territorial representation. If, however, territorial representation were to bring the greatest good to the greatest number, then I should give the matter my earnest consideration, but this has yet to be demonstrated. . . . I think that, until we gather outsiders into the ranks of the Pharmaceutical Society, it is useless to waste our energies propounding theories, however beautiful."

From Mr. J. B. **Purvis**, Local Secretary at Bridlington.

"I agree with your principle of territorial representation. It has much to recommend it. As far as I have heard that is the general feeling here."

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From Mr. **William Robertson**, Local Secretary at Elgin.

"It is more than two years since I advocated similar views to yours on territorial representation, and I am still of the same mind. If a suitable person as representative could be found in the district, all the better, but if not, the electorate could elect any other, though non-resident, provided he were in touch with the chemists of that district."

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From Mr. W. L. **Howie**, Local Secretary at Eccles.

"I have long entertained the belief that territorial representation would be a means of creating a more direct interest in pharmaceutical politics and the proceedings of the Society if members of Council would contest and report to the constituencies on the lines at present followed by members of Parliament."

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From Mr. **George Gange**, Local Secretary at Enfield.

"I think the present system of choosing representatives works well, and that territorial representation would not benefit us in any way."

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From Mr. **George Windeatt**, Local Secretary at Wellington, Somerset.

"At present I think the Council of the Pharmaceutical Society very efficient. When the larger number of chemists have joined the Society, then fresh schemes will be sure to ripen."

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From Mr. J. H. **Bibbings**, Local Secretary at Newton Abbot.

"I certainly look upon the movement as a forward one, and calculated to give force, strength, and solidity to the Pharmaceutical Society."

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From Mr. J. **Munday**, Local Secretary at Cardiff.

"I have pleasure in saying that some such change seems to me very desirable. It would, I think, favour better local knowledge of representatives, and hence increase the direct interest of members in Council proceedings, give better facilities for bringing the views of various sections of the trade before the general body, consolidate our organisation in many ways, and it should also improve the position of members of the Council, by giving them a definite constituency to consult and represent on debateable questions."

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From Mr. C. **Williams**, Local Secretary at Pembroke Dock.

"I do not think we can improve upon the present system, by which we can select the best men in the country."

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From Mr. R. H. **Groves**, Local Secretary at Blandford.

"Your territorial representation idea is a good one, and I wish the scheme the success it deserves."

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From Mr. W. F. **Smith**, Local Secretary at Abingdon.

"If your scheme would bring about that cohesiveness which should exist among the members it would be a capital thing, but while such apathy manifests itself in all administrative matters connected with the trade, I think it doubtful if your plan would be the success you anticipate."

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From Mr. W. P. **Lawrence**, Local Secretary at Knaresborough.

"It is my opinion that the Council of the Pharmaceutical Society is now doing good work in the interests of our profession, but I am with you in the desire that an infusion of new force should be inaugurated."

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From Mr. **Alfred Wright**, Local Secretary at Yeovil.

"I confess my inability to agree with you. I much prefer to be able to use my vote as at present, and, looking back upon the last twenty-five years, feel certain territorial representation would have done no better for us."

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From Mr. **George Roberts**, Local Secretary at West Bromwich.

"I am of opinion that your scheme would tend to cause chemists to feel interest in matters of the Pharmaceutical Society, and create more unity amongst chemists generally."

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From Mr. **Thos. Brayshay**, Local Secretary at Stockton-on-Tees.

"Your desire to interest chemists generally in the Society and its work has my hearty sympathy. I fail, however, to see any advantage in your scheme of territorial representation. I do not think, if it were in operation, we should find any material difference in the character of the Council. In fact, your table shows that we now have a wonderfully wise distribution of its members over the kingdom. The second part of your proposal, namely, that each district should have a periodical conference of its members and their representative sounds very nicely, but our experience in No. 1 would incline me to call it utopian."

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From Mr. **Wm. Allan**, Local Secretary at Dumfries.

"Territorial representation, if successfully carried out, would soon solve many difficulties that confront the trade, for representatives from the various districts would mean the best men the district could find, and would ensure the consideration of all matters intimately affecting these districts by the Council. It would at once give all the chemists in the districts a more direct interest in the conduct of Council, and would enlist their sympathy in the selection of suitable men to represent their views, and direct attention to their local necessities."

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From Mr. J. W. **Lasham**, Local Secretary at Romford

"My own district is so limited that I think the present *modus operandi* re Council would be quite as acceptable as the newly suggested, seeing that in either case we should have to depend upon the reported opinions of candidates."

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From Mr. **John Stroud**, Local Secretary at Bristol.

"It appears to me that there has always been a desire to elect any prominent man in the provinces to the Pharmaceutical Council. I cannot therefore see that territorial representation would be any improvement on the present system, nor could it possibly do more to increase the number of members than the local secretaries at present do, who come into contact personally with each druggist in his district every year."

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From Mr. J. **Hallaway**, Local Secretary at Carlisle.

"I fail to see in what way territorial representation will be better than our present system, or how it will make us a united body. We will not get better representatives. Taking our councils as a whole, I think they have fairly represented the legitimate drug trade, and at the same time the aims and desires of the founders of the Pharmaceutical Society, viz., the true advancement of pharmacy and the welfare of its members."

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From Mr. GEORGE S. DUBERLY, Local Secretary at Luton.

"I should say territorial representation would be most popular, and should lead to more unity and good feeling among chemists."

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From Mr. BARNARD S. PROCTOR, Local Secretary at Newcastle-on-Tyne.

"I do not think local representation would give a better council than the general representation at present in force. I think occasional local meetings have a harmonising and educating action, and if attended by a member of Council willing to learn and to teach, so much the better. I think local organisations generally fail through their calling periodical meetings more frequently than they have matters of general interest to discuss. I think 'the educational difficulty' does not exist except in the want of enthusiasm on the part of the students. I doubt whether annual grants to localities would do more good than harm. . . . I do not know what additional authority you want, or what interests you propose to look after, by the aid of the local branches of the Pharmaceutical Society, but my impression is that the greatest failing pharmacists have is the habit of looking to the Pharmaceutical Society to take care of their interests while they ought to feel that no one can fight the battle of life for them. This amœboid condition of the pharmacist is the natural sequel to a studentship in which the youth is begged to attend classes which are provided for him at less price than they cost."

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## NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

At a meeting of the Council of this Association, held at the Masonic Hall, it was unanimously decided to forward to the President and Council of the Pharmaceutical Society the following letter, signed by the President (Mr. R. FitzHugh) and Hon. Secretary (Mr. Wm. Gill), on behalf of the Association:—

"Gentlemen,—We desire to call your attention to the accompanying copy of a private letter received by Sir Walter Foster, M.P., from Mr. Milner, Chairman of the Board of Inland Revenue, in reply to communications from our Association respecting the administration of the Medicine Stamp Acts.

"In view of the many instances in which these Acts have been enforced in a vexatious manner, causing annoyance and loss to respectable law-abiding chemists, we would urge upon your Council the desirability of promptly taking advantage of Mr. Milner's invitation.

"The time is opportune for strong representations to be made to the Board respecting these grievances, and your Council being the only legally recognised body that could speak with the authority of the chemists of Great Britain, we feel you should open negotiations with the Board for the purpose of considering how the Acts may be amended.

"We submit the following suggestions for needed reforms for your consideration.

"First.—It is the custom of the Board to pay informers a commission on the penalties inflicted (*vide* 'Parliamentary Report,' May 20, 1892). This custom should be abolished.

"The Board acknowledges the law to be old and difficult of interpretation; this being the case, it is grossly unjust that a premium should be paid to persons to go about discovering slight and unintentional infringements.

"Second.—That in cases of obvious unintentional infringements, warning should be given before imposing a modified penalty or taking legal proceedings.

"When a person unwittingly infringes the Act he is usually willing to refrain from doing so on being shown his error, and to such a person it is exceedingly hard to have no course open except paying a modified penalty, or bearing the stain of having proceedings taken against him in a criminal court. As a consequence he pays the penalty, although he feels unjustly dealt with.

"Third.—That all B.P. preparations when bearing a label stating them to be such should be entirely exempt from the operations of the Act.

"These preparations when labelled as stated cannot lend themselves to be used as proprietary medicines, and it would be a great advantage for the safety of the public to have simple directions on the medicines in daily use.

"Fourth.—That in the case of medicines (other than B.P. preparations) in popular demand or of known composition, *e.g.*, chlorodyne, Easton's syrup, etc., it shall be permitted to state on the label the dose to be administered in the various diseases for which they are used.

"Fifth.—That special exemption with regard to the use of the possessive case should be made where the article bears the name of the originator of the formula, and not the name of the seller, providing that the article is of known composition.

"A list of such might be submitted by your Council to the Board.

"We offer these suggestions not as a complete and exhaustive list, but rather as an indication of the direction in which amendments appear to us to be required, and trust that your Council will do its utmost to bring about a much needed reform in the administration of these Acts."

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## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The fifth and last botanical excursion of the season took place on Wednesday, July 26, to Craigcrook, at 5.45 a.m., returning by train at 8.11 a.m. Among plants not found in previous excursions were *Achillæa Ptarmica*, *Campanula latifolia*, *Caucalis Anthriscus*, *Crepis paludosa*, *Digitalis purpurea*, *Equisetum palustre*, *Fumaria officinalis*, *Galeobdolon Tetrahit*, *Geranium pusillum*, *Hedera Helix*, *Linaria vulgaris*, *Nasturtium officinale*, *Polygonum maritimum*, *Polygonum amphibium*, *Salix Caprea*, the leaves covered with galls, *Scrophularia aquatica*, *Sparganium Simplex*, and *Sparganium ramosum*. Reports for the Botanical Excursions Prize are to be handed to the Secretary not later than October 1, 1893.

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# Society of Chemical Industry.

## PRESIDENT'S ADDRESS.

The Annual General Meeting of the Society of Chemical Industry was opened at University College, Liverpool, on July 12, when Sir John Evans, K.C.B., Treas. R.S., delivered his Presidential address as follows:—

When I look at the list of those who in past years have occupied the Presidential chair of this Society, all of them men eminent in the departments of either theoretical or practical chemistry, or, indeed, of both, I cannot but feel my own insufficiency to succeed them in worthily fulfilling the duties of this post. I am, indeed, tempted to inquire how and why it was that, in accordance with the pressing invitation of some members of the Council, I ever contented to allow myself to be placed in nomination as your President. It certainly was not on the grounds of any fancied chemical attainments; nor was it from my having been in former years associated with any industry that is usually regarded as being specially connected with chemistry. Far less was it in the hope that any remarks that I might be called upon to make while acting as your President could be of any particular interest or value to thóse who, in all probability, are far better acquainted than I can pretend to be with any subject that properly comes within the scope of such a Society as ours. I believe, however, that the main reason that I had for allowing myself to be brought forward is one that will, to a great extent, palliate my shortcomings in so many of the essential requisites for such an office. It was the hearty and entire appreciation that I felt of the work and aims of such a Society as that of Chemical Industry, that was the prime mover in the case. Whether I regarded the organisation of the Society, with its sections at all the principal centres of chemical operations, each to a certain extent independent, but all working harmoniously together, and forming one powerful and important body, with high objects and aspirations before it; or whether I looked at it as presenting a bond of union between industries apparently unconnected, while, at the same time, furnishing information of the most useful character to each and all, I could not but recognise it as a body in the highest degree conducive to the public welfare; so that on these, if on no other grounds, I should have been wanting in public spirit had I stood aloof when others urged me to accept the post of your President.

It is, I firmly believe, only by some such cordial cooperation among the different industries of this country as that which our Society has inaugurated, that the commercial position of Great, or Greater, Britain is to be maintained; and the more fully the interdependence between one branch of manufacture and another is recognised and acted upon, the more likely are we, as a whole, to maintain our place in the keen race of competition with other countries.

A merely cursory glance at our Journal will at once show how numerous are the departments of British industry that are more or less dependent on chemical knowledge, the information given on current literature and the specifications of new patents being arranged under no less than three-and-twenty different heads, many of them embracing several varying occupations. Not a few of these headings would, within my own memory, have conveyed but little meaning even to experts. I need merely carry back the minds of some of the elder members of the Society, not only to the days when aniline colours were not and Dr. Perkins was comparatively unknown, but to the time when lucifer matches had not been invented, when photography was practically non-existent, and when in most of those industries in which a knowledge of chemistry is now regarded as indispensable, the "rule of thumb" reigned absolute.

I can speak of those old times with some personal feeling, as it is now upwards of fifty years since, that having presumably completed my education, I first entered a paper-mill in order to learn the art and mystery of the manufacture of paper, with which the name of the firm of which I was until lately a member—that of John Dickinson and Co.—has been so long, and, I may venture to say, so honourably connected. It was, of course, recognised that some knowledge of chemistry was a requisite in such a manufacture, but I must freely confess that our methods were of the rudest, and that it was only as years rolled on, and first esparto fibre, and then the different kinds of wood pulp were introduced into the manufacture, and the various methods and results of sizing studied, that a thorough acquaintance with chemical laws became a *sine quâ non* for those who hoped for success in this branch of industry.

At the date that I have in view—say 1840—although rags were the staple material for the manufacture of paper, our consumption of them was but small, and they were principally used by us in producing paper for copper-plate work—steel plates at that time being rarely used—and for the highest class of printing papers. We consumed, however, a large quantity of raw material in the shape of the waste arising in the manufacture of linen and cotton goods, and we had collecting agents at Dundee, Belfast, Bradford, Leeds, and Manchester, who bought the waste upon the spot. At Manchester we had a mill, in which the cotton-waste was cleaned, boiled, and converted into what is known as "half-stuff," which was finally bleached and made into paper at our Hertfordshire mills. In that county we had another "half-stuff" mill, at Rickmansworth, where the linen waste was treated. The boiling was carried on in open keirs, or such as were partially closed, and always at a low pressure, as high-pressure boilers for such materials were practically unknown. Most of the waste was twice boiled, first with caustic lime, and secondly with a small amount of soda. The "shieves," or woody particles, that were unreduced by the boiling, were got rid of by a long process of screening, or "devilling," after the "half-stuff" had been dried so far as possible in hydraulic presses. The material was then bleached in stone chambers by the direct action of chlorine gas, produced on the spot in retorts. At the mills, however, where the "half-stuff" was converted into paper, the remains of the chlorine had to be washed out, and the final bleaching of the stuff to be effected with bleaching salts. No process for the recovery of the soda used in boiling was then known, and, indeed, the quantity used was so much less than that which is now necessary with esparto, that it would not have paid to recover it. I remember, however, being engaged in some experiments for the recovery of the manganese from the spent liquor of the retorts. Even when first Mr. Routledge introduced the use of esparto fibre no evaporating or recovery process was employed, but the double advantage was soon seen of avoiding the nuisance of polluting the streams into which the waste liquors were allowed to flow, and of regaining a quantity of soda at a small cost. With the general adoption of esparto as a material a radical change in the manufacture of paper was effected, and the difficulties in which the industry had been placed by reckless commercial legislation with regard to foreign rags in a great degree removed.

What has taken place in the manufacture of paper has been paralleled in numerous other departments of commercial enterprise, and not the least in those connected with the manufacture of chemical products themselves, in many, if not indeed in most of which, a complete revolution has been effected within the last fifty years, or even less. It would be a hopeless task to try to indicate the whole of the advances in chemical knowledge that have been made within that period, and yet I am tempted to give some few reminiscences of the condition of the science as exhibited in *Brande's Elements of Chemistry*, published in May, 1841, exactly twelve months after my first introduction to business, when compared with our knowledge at the present day.

Chemistry at that time was by no means in its infancy. Its foundations had been securely laid not only on the Continent, but in this country, and the names of Priestley, Cavendish, Scheele, Lavoisier, Davy, Wollaston, and other English investigators were already household worlds. There were, in 1841, twelve simple non-metallic substances known, from oxygen to boron, including selenium, and forty-three metals from potassium to silicium, including lanthanum and thorinum. For all fifty-five, symbols had been arranged, but these were in many respects different from those which are now in universal use. C, for instance, stood for chlorine and not for carbon, while B symbolised bromine and not boron. Potassium was designated by Po and not by K, and sodium by So and not by Na, while uranium was known as Urnm and not as U.

The atomic weights of the various substances had been approximately determined, though modern investigations have in some instances materially changed their ratio. Though hydrogen has retained its place as the unit, oxygen is no longer represented by 8, but by 15·96, or even less. Sulphur that was then 16 is now 31·98. Selenium, instead of 40, has now 78 assigned to it; while the number for tellurium has been increased fourfold from 32 to 128, and phosphorus has gone up from 16 to 30·96. Whether all our present figures will stand the test of time remains to be seen, and indeed recent researches have shown cause to doubt the accuracy of some of the figures that I have quoted. For myself, as a somewhat profane outsider, I must confess that it would be a source of satisfaction if future investigations should show that the figures now having three or four places of decimals attached to them might more properly be converted into integers, and oxygen came out boldly as 16, and sulphur as 32. This is, however, a digression.

Turning to the simple substances and metals of which, as already stated, 12 and 43 respectively were known in 1841, we find them now slightly increased. Of non-metals we reckon 15, and of metals 48. Some metals, like columbium and glucinum, have dropped out of our list, the latter having now become beryllium, while others, like cæsium, didymium, erbium, and rubidium, have come in.

On the whole, the changes and advances in inorganic chemistry have not been extreme. It is in organic chemistry that what cannot be regarded as anything short of a revolution has taken place. It is not a matter on which I can dilate, but as indicative of what has been going on I may mention that while three volumes have sufficed to Roscoe and Schorlemmer for inorganic chemistry, no less than six have already appeared in continuation treating of organic chemistry, and more are to follow; so that the proportions have been reversed which prevailed in the days of Brande, who devoted 367 pages only to organic chemistry, and 1042 to introductory matter and inorganic chemistry.

But whatever may have been the advances in chemistry within the last fifty years, whether as a pure or an applied science, the extension of its boundaries towards physics in the one direction, and biological studies in the other, is at least as remarkable. While the study of spectrum analysis has rendered most valuable assistance in the chemistry of the constituent substances with which we are familiar upon earth, it has enabled the astronomer to carry his speculations not only to the constitution of the sun and stars, but to that of nebulæ, comets, and meteors, and in the hands of Mr. Norman Lockyer and Mr. Huggins may yet lead us to travel with some degree of confidence in paths hitherto untrodden. In the domain of electricity it is hard to say whether that science does not owe nearly as much to chemistry as chemistry does to it. In the practical application of electricity to lighting purposes, chemistry has still to be called on to produce some improved form of secondary battery, and some portable form of primary battery which shall prove of ready application by our miners. It is needless to recall how much our underground workers are indebted to chemistry for their comparative immunity from danger from fire-damp, a danger which the efforts now being made by chemists will, I hope, still further diminish. Electricity has also placed at the command of chemists greater intensity of heat than can be derived from ordinary sources.

The study of heat, irrespective of electricity, has largely reacted on chemistry, and while the Bessemer process has entirely revolutionised the manufacture of steel, and almost annihilated the distinction in value between that and other forms of iron, the Siemens and other furnaces have led to unprecedented economies in the expenditure of fuel, and at the same time have facilitated the application of heat in various chemical processes. In the other direction—the absence of heat—Professor Dewar has, during the present year, made most important advances. Although air had previously been liquefied, he has now been able, by means of intense cold alone, to reduce atmospheric air to the liquid condition. His further results, by a combination of enormous pressure and extreme cold, are well known, and now that oxygen and nitrogen have yielded themselves to the advances of science and have been obtained in quantities in a liquid state, it is hard to say that hydrogen is destined always to remain intractable. What may be the ultimate result of the investigations that can now be carried on at temperatures ranging from 100° to 200° centigrade below the freezing point of water, it is impossible to foresee. From researches already made in this country and in France, it would appear that most substances under extreme cold are, so to speak, dead, and that their ordinary affinities are in abeyance. Possibly what may be termed "glacial chemistry" may eventually enlarge our views as to the various properties of matter.

As to the advances in our knowledge of the chemistry of light, the present condition of photography may testify. When we can take the image of a bullet flying at the rate of 3000 feet per second, with its accompanying cone of compressed air; when we can produce photographs which are practically permanent, and when we call in the action of light to engrave our steel or copper plates, and to produce efficient substitutes for woodcuts, we seem to be getting near the limits of the practical application of photography. And yet many of us may remember the days when the daguerrotype was regarded—and justly so—with wonder; and I can myself call to mind a still earlier form of photography, by which natural leaves were reproduced on paper sensitised with a salt of silver, of which I saw specimens in an exhibition at Dresden so long ago as the year 1839.

In the introduction of artificial light much also has been done. It is true that Pall Mall was experimentally lighted by gas in 1807, but it was not until 1842 that gas found its way into Grosvenor Square and some other aristocratic quarters of the metropolis. Since that time immense strides have been made in the process of gas manufacture, while, in consequence of the waste products arising in the process having now found commercial uses, great reductions have been made in its cost. At the present time gas has to compete with electricity as an illuminant, while in many cases it has been superseded by mineral oils, which are now so abundant and cheap, and of which in this Society the flashing point may be said to be almost a burning question. If, however, gas is losing ground as an illuminant, it seems to be gaining it as a source of power, and there are prospects of a considerable increase in the use for this purpose of hydrogen and its compounds, containing far less carbon than ordinary coal-gas.

In metallurgy also, in addition to the improvements in the manufacture of steel already mentioned, many noteworthy discoveries have been made. One of the most important of these is perhaps that of the production of aluminium on a cheap scale and in quantities sufficient for various applications to ordinary use. It seems somewhat remarkable that the progress in the use of a metal at once so light and so strong is not more rapid.

The applications of some of the more modern alloys, such as phosphor-bronze, seem also susceptible of considerable further development.

The extensive manufacture of sodium affords another instance of what was formerly the mere subject of a laboratory experiment, being now conducted upon a commercial scale.

I may here just glance at the attempts that have been made to produce artificially some of the precious stones that occur in nature. Rubies have been manufactured, not indeed such as could rank as gems, but still such as will serve to "jewel" the pivot-holes in watches; and though the results of attempts to produce the crystallised form of carbon, which is known as the diamond, have as yet had but doubtful success, it does not appear to me that the prospect of producing genuine diamonds under combined heat and pressure is absolutely hopeless.

Another direction in which great advances have been made, and in which it seems probable that there yet remains something to be discovered, is the grouping of the various elements into small divisions, having more or less analogy the one with the other, and the classification of the atomic weights in one harmonious series. What is known as the Periodic Law of Mendeleeff and of our own Mr. John A. R. Newlands, has suggested the possibility that what we now know as metals or elements may have some at present hidden connections between them, so that eventually some of them may prove to be rather compound bodies than strictly elementary substances. This, however, is for the chemistry of the future.

In organic chemistry, which has been defined to be the chemistry of the hydrocarbons and their derivatives, it is, as I have already observed, that the most wonderful development has taken place within the last half-century. Who, for instance, in 1840 could have foreseen the important part that aniline was to play in dyeing and colouring? It was not, I think, till 1856 that Perkins's mauve was really brought into commercial use, but since that time what a rainbow of colours has been produced from what would have seemed a most unpromising source! How brilliant are their hues, but as yet, in many cases, alas! how fugitive! Regarded from an artistic point of view, these colours can hardly be esteemed an unmixed blessing; and even the fabrics of Eastern looms have not escaped their influence.

"Quæ regio in terris nostri non plena *coloris?*"

Turkey, Persia, India, and China have, I fear, in many cases sacrificed taste to cheapness, and harmony to splendour in colour. It is a source of some satisfaction to know that the woad with which our ancient British predecessors stained their bodies is still cultivated among us for the purpose of dyeing wools, even though it has acquired the name of *Isatis tinctoria* and the colouring extract is now classed as an *Indigotin.*

Among inorganic colours I may here briefly mention ultramarine, which instead of being patiently produced by the careful treatment of lapis lazuli and sold at many shillings an ounce, is now manufactured by the ton and quoted by the hundredweight. Would that the artificial colour was as fine and permanent as the natural! I have, in my own time, seen it supersede smalts as a colouring matter in paper-making, and I have known its use not unfrequently accompanied by the abundant presence of sulphuretted hydrogen as a product of its decomposition.

Not only colouring matters but our flavours and scents have been synthetised, though art, if superseding nature for a time, must eventually acknowledge her inferiority even in pear-drops. Whatever our æsthetic feelings under these circumstances may be, we cannot but admire the skill and scientific energy by which such results have been attained. How far "saccharin," one of the latest results of the chemist's ingenuity, is likely to supersede the use of ordinary sugar, is a question on which I decline to speculate. The manufacture of our every-day sugar has, however, itself undergone a complete metamorphosis within the last fifty years, with the result that it is now produced at what would formerly have been regarded as an absolutely impossible price. In 1840, beet-sugar was in its infancy, and such has been the improvement in the growth of the beet and the process of manufacture that nearly twice the weight of sugar is now produced from a ton of beetroot as there was at that date. In the production of cane-sugar also immense economies have been effected, especially in the process of evaporation. The study of the effects of saccharine solutions on the polarisation of light, and our acquaintance with the distinctions between dextrose and lævulose, and of the conversion of starch into sugar, all come within comparatively modern times.

Much of our knowledge of the mysterious processes of fermentation is also of recent date, and it is in connection with these processes that the chemist finds himself brought into close contact with the botanist and the pysiologist.

Whatever suspicions Leeuwenhoek and the early microscopists may have had with regard to the vegetable character of yeast-cells, and however clearly Cagniard de Latour and Schwann may have established its plant-like nature and its connection with fermentation, it was not until Pasteur's researches from 1857 to 1861 that the true character of the yeast-plant, and of other micro-organisms which lie at the base of most fermentative processes, can be said to have been absolutely demonstrated. The beneficial effect of his inquiries, and of his methods of obtaining a pure cultivation of yeast, is universally recognised, and has reacted in the most remarkable manner on the brewing industry.

But M. Pasteur's researches have also led to much wider results, as it has been mainly in consequence of his careful observations that the wonderful influence for good or for evil of organisms so minute as in some cases almost to defy the power of the microscope, has now been so fully recognised. The germ-theory of the orgin of many diseases meets with much more general acceptance than it did but a few years ago; and though the bacilli and bacteria which are characteristic of some virulent diseases, such as anthrax, are only agents in certain fermentative processes by which poisonous matters are engendered, their existence and character seem to be placed beyond all doubt. The process of obtaining immunity from the action of these poisons by the gradual introduction of the virus into the animal system, thus rendering it insusceptible of receiving further injury from the same poison, has been successfully introduced, both among men and beasts, and hydrophobia and anthrax have been successfully combated.

A recognition of the influence of germs has led to the introduction into surgery of that antiseptic system of treatment with which the name of Lister will always be associated, and which has done so much to diminish suffering and preserve life. While upon this topic I may just allude to another instance in which chemistry has come to the assistance of medical science, I mean in the production and investigation of those anæsthetic agents which play so important a part in modern surgery, and which have done so much to alleviate human suffering.

But while the ferments produced by micro-organisms are on the one hand so pernicious, it is very doubtful whether, on the other, they are not equally beneficial, if it be really the case that such processes as digestion are in a great measure due to their action. How far the nitrification of the soil may be due to micro-organisms is a question not yet absolutely solved, though strong presumption has been raised of their being, at all events, potent factors in the case.

Now that so many diseases have been traced to pathogenic organisms which are constantly present in water contaminated by sewage, the question of the vitality of these organisms and their germs has been rightly regarded as one of great public importance, and the Royal Society, in conjunction with the London County Council, has instituted an investigation into it, which is being diligently prosecuted both from the botanical and the chemical points of view. The remarkable power of light, whether that of the sun or electric, in sterilising the germs of some micro-organisms, already to some extent previously known, has been conclusively demonstrated by Prof. Marshall Ward.

Much has been done of late years by chemists towards the purification of sewage with the view of rendering the effluents from the ultimate drains of our large municipalities as innocuous as possible, and the results obtained have been in many instances satisfactory. They would, no doubt, have been even more so had not the imperative demands of economy limited the cost. Still, whatever may be done, I am inclined to think that there is much truth in the metrical abstract of a paper read some years ago before the Royal Society :—

"Sewage, however disinfected,
Is not from ill results protected;
Though made to all appearance pure,
It still remains not safe, but sewer."

I will not attempt to discuss the important question of the disposal of the sewage of our great towns, but to many it will appear as somewhat of a disgrace to our powers of applying chemical knowledge, that such vast accumulations of what were originally highly fertilising substances should be discharged into the estuary of the Thames, and not only be absolutely wasted, but converted into a perpetual nuisance, brought up at each tide within the limits of the metropolis from which they started.

It is true that within the last fifty years we have imported enormous quantities of guano, phosphates, and nitrates, but of these there must eventually become a scarcity, if not an end. In the meantime, may not chemists do something to reduce the waste of fertilising agents that is now taking place among us? Agricultural colleges have been founded, agricultural chemistry is a recognised branch of science, but with increase of knowledge has come increase of foreign competition, fostered by improved means of transport and communication, and it is at the present time a doubtful point whether many soils, even if rent-free, can be cultivated in this country for cereals, except at a loss.

While touching on agricultural chemistry, I cannot pass over in silence the experiments which have now been carried on continuously for a period of fifty years at Rothamsted, by Sir John B. Lawes, assisted during the whole half-century by Dr. Gilbert. The extremely liberal provision which, during his lifetime, Sir John Lawes has made for the purpose of continuing and extending his experiments, would alone entitle him to a full measure of public gratitude. When, however, we consider the nature and extent of the experiments already conducted, we must feel that no expression of public estimation can be too high when, as will shortly be the case, the Rothamsted jubilee is celebrated. As to the results already obtained, and as to the nature of the experiments still being carried on, it would be out of place here to enlarge. Remarkable, however, as are the effects of different manures on the botanical character and growth of herbage, and on the strength and yield of cereals, the different results arising from the mere variation of the temperature, sunshine, and rainfall, in successive years, are more remarkable still.

I feel, however, that I have detained you long enough with these crude considerations of topics more or less chemical in their character, and that it is time for me to conclude.

We are here assembled on the borders of the two counties of Lancashire and Cheshire, in both of which are great centres of chemical manufactures, and the principal productions of which are in a great degree dependent on the knowledge and due application of chemical laws. We meet at the seat of one of the most active sections of the Society of Chemical Industry, which has received us with open arms, and has provided us with an "Open Sesame," which will admit us to inspect many of the most interesting of the works and factories of the district. We gladly avail ourselves of the opportunities thus liberally opened to us, and if by chance any of us can afford assistance, advice, or encouragement to our brethren in Liverpool, I am sure that all present will gladly render it, and not forget that we are all members of one body, and all mutually interested in the advance of chemical knowledge, and especially of Chemical Industry.

# Parliamentary and Law Proceedings.

## Proceedings under the Pharmacy Act.

### ACTION FOR SELLING POISONOUS DRUGS.

At the Leeds County Court, on the 4th inst., before his Honour Judge Greenhow, an action was brought by the Council of the Pharmaceutical Society to recover a £5 penalty for selling poisonous drugs without being registered from Arthur Goodall, who keeps a drug store at 191, Meanwood Road, Leeds. Mr. Grey, barrister, London, appeared for the Society, and the defendant was represented by Mr. H. A. Child, solicitor, Leeds. Owing to his Honour being unwell, it was arranged that after evidence had been taken the case should be adjourned until October.

Ethel Moseley, 10, Cliffdale Street, Meanwood Road, said she went to the defendant's shop on April 8 and purchased a bottle of Powell's balsam of aniseed. She afterwards showed the bottle to her stepfather, who was waiting for her outside the shop.

George D. Telfer, 10, Cliffdale Street, Meanwood Road, said that he went with his stepdaughter to the defendant's shop, and stayed outside while she went in to purchase the balsam of aniseed. He afterwards saw the bottle she had purchased.

Mr. Grey: Were you instructed by the Pharmaceutical Society?

Witness: I was.

Mr. Child: Was this your first job on behalf of this praiseworthy Society?

Witness: No, sir.

Mr. Child: You have done it in other towns, have you not?

Witness: Not much in other towns, but I have done it in Leeds.

Harry Moon, clerk in the office of the Pharmaceutical Society, said that he received the bottle produced on April 14. The medicine stamp was still on it, showing that the bottle had not been opened. He handed it over to Mr. Eastes for analysis.

Ernest John Eastes, analyst, said that on July 20 he received the bottle from the last witness for analysis. The stamp was still upon it. He analysed the contents of the bottle and found morphine.

Mr. Grey: Was there more than an infinitesimal quantity of morphine in it?

Witness: Yes, a good deal.

His Honour: You do not get very far by that. More than an infinitesimal quantity might still be very little. Was it appreciable?

Witness: Yes, there was a good appreciable quantity in it.

Mr. Grey: What was the exact amount?

Witness: One-third of a grain in an ounce bottle.

Mr. Child: Did you analyse the mixture which was the subject of an action in the Manchester County Court?

Witness: Yes.

Mr. Child: Was there more or less than in this?

Witness: I do not know.

Mr. Child: What was that called?

Witness: Licoricine.

Mr. Child: Was it a mixture for colds?

Witness: Yes, but not like this.

Mr. Child: It was not for corns and bunions, but for colds and coughs?

Witness: Yes.

Mr. Grey said that that was all the evidence he proposed to call, and the case was thereupon adjourned.

### POISONING BY MERCURIC CHLORIDE.

On Wednesday, August 2, Mr. Wynne E. Baxter, the East London Coroner, held an inquiry at the London Hospital, respecting the death of Edith Ellen Cockman, aged 20 years, unmarried, and lately residing at 30, Marsh Gate Lane, Stratford, who committed suicide under the following sad circumstances.

Ellen Cockman said the deceased was her daughter, and assisted her in the housework. On Saturday last witness left her cleaning up the house, and upon returning found her in the kitchen looking very peculiar. The deceased exclaimed "Oh, mother, I have taken some poison." Witness at once gave her some salt and water and put her to bed, and a doctor was summoned, who ordered her removal to the hospital. The deceased said that she had obtained the poison from her brother's bottles. The deceased had been very low spirited for some time because she had not enough energy to do what she would like to, and she also suffered from want of sleep. Witness added that everything was done to make the life of the deceased happy and comfortable.

Willie Cockman, brother of the deceased, stated that he practised photography, but kept his chemicals away from the house. On Saturday last he was sent for, and found the deceased had taken chloride of mercury out of one of his bottles.

The Coroner: Was it labelled "Poison?"—No, sir.

The Coroner: Then how did she know that it was poison?

Witness: I was developing some negatives on the previous night, and told her it was poison.

The Coroner: It ought to have been labelled.

Dr. Walters, house-surgeon, deposed that death was due to the effects of mercurial poison.

The jury returned a verdict of "Suicide whilst temporarily insane."—*Morning Advertiser.*

## Reviews and Notices of Books.

THE ORIGIN AND GROWTH OF THE HEALING ART, a popular history of medicine in all ages and countries. By EDWARD BERDOE, L.R.C.P., M.R.C.S., L.S.A.*

The history of the growth of medicine is of interest especially to those who, having learnt the application of science—as it stands to-day—to the alleviation and the cure of disease, may have leisure to look back and, whilst comparing what is with what has been, indulge the legitimate hope that the brilliant advances made in the past may be rivalled by those to come. Whether there is call for a "popular" history of medicine is a question. The subject so closely relates to the physical side of man and the processes of reproduction of the species that the utmost tact is required in writing a book of a popular description.

In civilised countries the success attained at any given period in medicine and surgery depends chiefly on the degree of perfection which has been attained in physical and natural science, and especially in pathology. In the book before us the author includes a notice of medicine as practised by savages, and also alludes to instances of animals adopting measures for the relief of disordered functions and injuries. Medicine amongst savage tribes necessarily consists largely of superstition and traditional practices—some murderous, others conceived with wonderful daring and executed with success. The instances of remedial measures said to be adopted by animals require a large dose of imagination for their literal acceptance as rightly interpreted facts. Thus, "In a case recorded by M. Magnin, a snipe, which was observed to fly away with a broken leg, was subsequently found to have forced the fragments into a parallel position, the upper fragment reaching to the knee, and secured them there by means of a strong band of feathers and moss intermingled. The observers were particularly struck by the application of a ligature of a kind of flat-leaved grass wound round the limb in a spiral form and fixed there by a kind of glue." The anecdote requires an explicit statement of the nature of the "glue," and it seems on the whole more probable that the case was one of fortuitous surgery rather than a painful and unsurgical attempt on the part of the bird to set its own fracture.

Since the work is intended as a popular account of the growth of the healing art, it seems to us that certain matters might with advantage have been omitted as being unintelligible to some, and only too interesting to other readers.

Thus the description of a Cæsarian section, performed with perfect success by a native in Central Africa, might serve to stimulate the talents of a medical student, though without anatomical diagrams it would happily be unintelligible to an ordinary reader. Again, mention of the measures taken by certain savage tribes to limit the population, though of great interest to philosophers and medical men, would appear to be out of place in a popular work. It is, however, only here and there that the drawing-room reader is puzzled or offended, whilst there is a great amount of interesting reading supplied, such as the chapters on Egyptian, Hebrew, and Indian medicine. The temples of Æsculapius, according to the author, were dependent for their success on the practice of unconscious hypnotism. "After prayers to the god, ablutions, and sacrifices, the patient was put to sleep on the skin of the animal offered at the altar, or at the foot of the statue of the divinity, while the priests performed their sacred rites. In his sleep he would have pointed out to him in a dream what he ought to do for the recovery of his health. Sometimes the appropriate medicines would be suggested, but more commonly rules of conduct and diet would suffice. When the cure took place, which very frequently happened by suggestion, as in modern hypnotism, and by the stimulus to the nervous system consequent upon the journey and the hope excited in the patient, a record of the case and the cure was carved on the temple walls." The chapter dealing with Hippocrates (born 460 B.C.) is written with enthusiasm worthy of the subject. "The minuteness of his observations, his rational and accurate interpretations of all he saw, and his simple methodical, truthful, and lucid descriptions of everything which he has recorded, excite the admiration and compel the praise of all who have studied the works which he has left. Nor are his candour, honesty, caution, and experience less to be extolled. He confesses his errors, fully explains the measures adopted to cure his cases, and candidly admits that in one series of forty-two patients whom he attended only seventeen recovered, the others having perished in spite of the means he had proposed to save them. He was probably the first public teacher of the healing art."

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* London: Swan, Sonnenschein and Co. Pp. i-xii., 1 to 509. Five illustrations.

Asclepiades and Celsus are the chief names in Roman medicine. Asclepiades, himself ignorant of anatomy and physiology, "decried the labours of those who studied those sciences, and violently attacked Hippocrates." He "practised tracheotomy for angina and scarification of the ankles in dropsy, and recommended tapping with the smallest possible wound. He also observed spontaneous dislocation of the hip-joint. Such things do not emanate from mere quacks." Celsus (50 B.C., 7 A.D.) is said to have practised only as an amateur, though in his writings he showed himself a skilled anatomist and surgeon. "Had it not been for the works of Celsus, many operations of ancient surgery would have remained to us undescribed. He writes at length on bleeding, and describes the double ligation (or tying) of bleeding vessels, and the division of the vessels between the ligatures; an operation which the defenders of experiments on animals claim to have been discovered by vivisection. His method of amputation in gangrene by a single circular cut was followed down to the seventeenth century. He describes the process of catheterisation, operations for goitre (or Derbyshire neck), the resection of ribs, the use of enemas, and artificial feeding by them, an operation for cataract, ear diseases which are curable by the ear-syringe, extraction of teeth by forceps, fastening loose teeth by means of gold-wire, and bursting hollow teeth by peppercorns pressed into them."

The method of "bursting hollow teeth" seems to have fallen into disuse, perhaps because no patient would allow any dentist to do it twice.

Passing to more modern times, the author, in speaking of the founder of Homœopathy (1755-1843) says: "The sciences of anatomy and physiology are quite superfluous to the homœopathist, the remedies being addressed to symptoms, the knowledge of their causes can have little or no concern to those who follow Hahnemann's doctrines." No more powerful condemnation of any system of medicine could possibly be written than that conveyed in the above quotation. Happily in many cases the treatment of a disease is of small importance, since the condition tends naturally to recovery. In such cases the practice of a homœopath may often be better than that of a too energetic regular practitioner. The former will nearest succeed in doing nothing. In other cases a convinced fanatic, with eager eye and solemn assuredness, by placing in a tumbler a few drops of a "high dilution" with note-paper and teaspoon to protect the precious elixir and convey it at stated intervals to the mouth, produces a hypnotic suggestion hardly less effective than that of the temples of Æsculapius in relieving slight neurotic affections.

But it is terrible to contemplate the danger to society a sincere homœpath must constitute. His eye fixed on symptoms which often lead the attention away from the underlying cause, with which our author tells us the follower of Hahnemann is not concerned, he will fail to find collections of pus in pleura or peritoneum. He will often fail to distinguish a surgical from a medical case, conditions such as gastric ulcer may be overlooked, aneurisms treated for neuralgia. It is not too much to say that a system of medicine which ignores the cause and the anatomical basis of the disease is a system of homicide. The homœopath fanatic is to be distinguished from the homœpath of the world. The former is ethically pure though, on certain occasions, deadly. The latter sees a market, and while professing to meet the demand he supplies the rational treatment with more or less show of dilution apparatus. Ethically inferior, he is practically a corrective of the former class, as the good matron, with her "domestic dictionary of dilution lore," is as likely to fall into his hands as into those of the dangerous visionary.

One can trace in various parts of the work the author's animus against experimental methods. The chief argument used against the employment of animals for the investigation of disease by inoculation, experiments, etc., is a quotation from a speech made by a distinguished physician as long ago as 1883, when the now great science of bacteriology was but dawning.

It is certain that the quotation does not represent the views held at the present time by the physician referred to, for he is one of those who recommend to the Government certain individuals as fit to perform experiments on animals. Since Lister realised the fact that natural suppuration is due to certain bacteria, and based on this, the principles of antiseptic surgery, the death-rate after some surgical operations has fallen from a terrible height almost to zero. Thus whilst the histories appended to museum specimens, comprising parts removed by amputation, etc., before twenty years ago, end with painful frequency: "died from erysipelas, pyæmia, secondary hæmorrhage, meningitis, spreading gangrene," and so forth, such things are now practically banished from our hospitals. In the course of ten years the application of antiseptic surgery must have saved as many human lives as lives of animals had been sacrificed to establish the method.

Again, the author, speaking of bacteriology, says vaguely, "the matter is beset with fallacies." No one who has grasped the masterly demonstration given by Koch of the tubercle bacillus and its relationship to the disease tuberculosis could speak in such terms. It is only ignorance which begets the "anti-vivisectionist." That the liberty to perform experiments should be confined to competent persons and regulated with judgment few in this country dispute. That, however, is not the drift of Dr. Berdoe's references to the subject. Again we must say only ignorance could excuse the vague words we have quoted. We may take the case of tuberculosis as an example: there the matter was "beset with fallacies" until the experimental method and experiments on animals established the pathology of tubercle and dispelled the clouds of theory that had before prevailed. We now know the cause of the disease. It might be objected that that knowledge has not indicated a cure, and that Koch's own treatment proved a failure. It matters not. We know the cause, we know that the disease is infectious, we know some of the channels of infection, such as tuberculous milk and meat. This knowledge applied by the medical profession for the prevention of the disease will counterbalance a million times over the lives of guinea pigs sacrificed in the course of experiments which led to the knowledge with an amount of pain quite insignificant when compared with that inflicted on pigs, sheep, and oxen daily castrated to make them fatter for table.

It would appear that this want of information and bias of mind on the part of the author seriously discounts the value of the work as a trustworthy popular account of the subject dealt with. The past twenty years constitute the most splendid epoch in the history of medicine, thanks chiefly to the practise of experiments on living animals.

## Correspondence.

### The Medicine Stamp Duty.

Sir,—I should like, with your permission, to contribute a few lines on the above subject, especially since we have the definite promise to the Nottingham Chemists' Association that any real grievances will be redressed. I will preface my remarks by saying that I am not one of those who are clamouring for the abolition of the Patent Medicine Act. Its repeal could do no good and might result in untold harm, both to the public and to our own trade. Those persons who go into the proprietary medicine business ought to stamp their medicines. The man who tries to bamboozle the public into the belief that he alone possesses all the brains and that his neighbour is consequently a fool ought to pay for the privilege. The distribution of medicines under the Medicine Stamp Act is the worst system that could possibly be devised. The idea of persons prescribing for others whom they have never seen and of whom they know nothing is ridiculous. It is the more so when we remember that a large proportion of stamped medicine proprietors are neither chemists nor doctors, but simply quacks, who are saved from the responsibility of their acts by the stamps placed on the medicines. There are two alleged grievances I should like to consider. First, the use of the possessive case. Secondly, the description of the use of the medicine in which no special proprietorship is claimed. In the former of these the chemist has little to complain of. It is true that some slight inconvenience may be caused to chemists in such cases as Blaud's Pills and Easton's Syrup, but this difficulty can easily be surmounted in the manner suggested by Mr. George Crook in the Journal for July 22. The practice of using the possessive case in relation to medicines is very objectionable, and has so much increased during the last twenty years, that if it increases in the same ratio the trade will be worthless to anyone in the near future. And instead of selling "Rhubarb Pills" we shall have to supply "Blank's far-famed Rhubarb Pills," "Jones's Extract of Cascara," etc., etc. This is so manifestly absurd, that I should be sorry to see the law relaxed in the slightest degree in regard to the use of the possessive case. The second point calls for very different treatment, however. We ought to have the power and liberty to fully describe the uses of all pharmacopœia and extra pharmacopœia medicines, such as cascara, sal volatile, Gregory's powder, etc. It is absolutely unfair to both ourselves and the public to prevent us from giving a reasonable description of such drugs as I have named. As an instance take the following: "Spirit of sal volatile, useful in headache, faintness, sickness, etc., dose, half to one teaspoonful in water;" and again, "Fluid extract of cascara, useful in obstinate constipation, hæmorrhoids, etc., dose, fifteen drops to one teaspoonful in water." This privilege we ought to claim as being reasonable and right. Years ago the trade was carried on on different lines: there were more simple drugs sold, and it was better for the public. We have latterly sadly deteriorated and got into a deep rut which it will take years to get out of. Instead of customers asking for simple drugs which were formerly sold so largely across the counter, now, alas, it is for some overpuffed article with a big name to it. Chemists might with advantage throw these things out of the window, and cultivate a trade for the drugs and preparations of the pharmacopœia and extra pharmacopœia, which in my opinion are ample for all cases, and need no proprietary names tacked on to them, and then I feel sure our trade would be much increased, to the mutual advantage of ourselves and the public, especially if we were allowed to label them in a suitable and convenient manner.

*Liverpool.* WALTER A. GRACE.

Sir,—Though the Medicine Stamp Acts be not perfect, yet after carefully examining the matter, even as set forth on back of licence, we should not have much difficulty in complying with requirements without inconvenience to ourselves as chemists. The spirit of the Act is to tax secret and proprietary medicines, and such as are held out by public notice, etc., as being beneficial towards correcting any abnormal condition of the human body. The letter of the Act is very far-reaching, but in enforcing it the Board exercises great discretion and, indeed, leniency towards chemists, considering that they show much hostility in return. As for the "blood-purifying" type of labels and notices, it is to be deplored that the letter of the law does not render them liable to duty. Thereby is furnished another example of the words of an Act not accomplishing all that its spirit aims at. If chemists elect to identify themselves with quackery it is unreasonable for them to expect to escape its troubles. It is highly discreditable both that chemists should put up preparations, B.P. or otherwise, in such a way as to require stamping, and that in their labels and notices the custom should be so prevalent of "trumpeting" their wares as far as they dare without incurring duty. It is well that the Act presents an obstacle to this spirit. Would that the obstacle were sufficient to crush it out altogether, when we would be pleased to see the disappearance of a "remnant of barbarism."

*Glasgow.* J. ANDERSON RUSSELL.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Davis, Gill, Gordon, Ough, Parry, Smith, Wright.

The Pharmaceutical Journal.
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, AUGUST 19, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE CONFERENCE AT NOTTINGHAM.

NOTTINGHAM, the "Queen of the Midlands," is now added to the list of those places which have twice entertained the British Pharmaceutical Conference, being the fifth place to enjoy that distinction. Few more suitable places could be selected for such meetings, the town being readily accessible by reason of its central situation, and so conforming to the chief requirement—being conveniently situated for the members generally. In addition to this, however, though not pretending to the peculiar picturesqueness of its immediate predecessor, Nottingham can fairly claim to exceed in historical interest the average place of meeting of British pharmacists, whilst its surroundings are approached in beauty by those of but few manufacturing centres. In spite, therefore, of several adverse influences, there was good reason to expect that the interest taken in this annual function, as indicated by the number of those attending it, would show no sensible diminution on this occasion, and the attendance actually proved to be little, if at all, behind that at Edinburgh last year. We understand that two hundred and ten of the No. 1 books of tickets and two hundred and twenty of the No. 2 books were disposed of.

Reception. In their anxiety for the comfort of their guests, several members of the local executive committee were in attendance at the Exchange Hall on the afternoon of the opening day, to answer inquiries and furnish any assistance that was required by those who were unfamiliar with their surroundings. Subsequently, as the evening wore on, the official reception was held at the Castle, the President, Mr. OCTAVIUS CORDER, being supported by several members of the general and local executives.

Conversazione. The exhibition of the numerous antiquities and works of art in the Museum and Art Gallery formed a special feature of the conversazione that followed the reception, and the instrumental music provided gave an extra zest to the proceedings, though the special attraction was, of course, the opportunity afforded for renewing old acquaintanceships.

Sessions of Conference. On the Tuesday morning the serious business of the Conference was pleasantly inaugurated, in the Borough Council Chamber, by the Mayor of Nottingham, Mr. Councillor A. BROWNSWORD, welcoming the members to the scene of their mingled labours and pleasures. The list of delegates and a number of letters of apology for absence were then read, after which the senior Honorary Secretary, Mr. W. A. H. NAYLOR, submitted the report of the Executive Committee for approval.

Report of Executive Committee. In this the Committee congratulated the members on the continued success of their organisation, since there was no indication of any decline in the interest taken in the work of the Conference. During the thirty years the body had existed, it was felt there was abundant evidence that the objects for which it was constituted had been promoted, and there was sufficient reason to warrant a belief in an equally useful and important future. Attention was drawn to the fact that the resolution passed at Edinburgh last year emphasised the fact that the Conference was at liberty to meet at whatever time and place seemed most desirable. By the death of Dr. SOUBEIRAN, Professor of Pharmacy at Montpellier, France, a distinguished honorary member had been lost, and the Committee also recorded with deep regret the death of Mr. SAMUEL GALE, an acknowledged authority on pharmaceutical matters, whose long experience on the Board of Examiners brought him into contact with a large number of pharmacists by whom he was universally esteemed. The Blue List had been revised and contained suggestions for work on subjects which, it was believed, would amply repay investigation. A grant of five pounds had been made to Mr. WILLIAM ELBORNE to defray expenses in connection with an investigation of coto bark, a first report on which would be read at the present meeting. With unfeigned regret the Committee announced that, owing to continued ill-health, Mr. R. H. DAVIES had felt compelled to resign his office as Treasurer, and desired to place on record its high appreciation of the importan service he had rendered the Conference. The Senior Honorary Secretary was instructed by the Committee to convey to Mr. DAVIES the terms of a resolution to this effect and, at the same time, to express the hope that he might soon be restored to his accustomed health.

Financial Statement. In the absence of the Treasurer Mr. R. H. DAVIES, the report of whose continued ill-health caused general regret, the Financial Statement was also read by Mr. NAYLOR. This presented the usual features and was formally adopted by the meeting, together with the Report of the Executive. The President then suggested that a cablegram of congratulation be sent to the conference of pharmaceutists assembled at Chicago, and this was agreed to with acclamation.

Colonial Visitors.

Attention was next drawn to the fact that two distinguished visitors from the Colonies were present, in the persons of Mr. Alfred Reeve, a member of the Council of the Pharmaceutical Society of Australasia, and Mr. Mager, a member of the Board of Examiners of Cape Colony. The latter expressed his pleasure at being present, and briefly described the arrangements for examination at the Cape, after which the President proceeded with his address.

President's Address.

Mr. Corder commenced by referring to the increasing difficulty experienced in selecting suitable subjects for such occasions, and noted the fact that it was fifty years since he entered upon his term of apprenticeship in pharmacy, so that he was celebrating the jubilee of his connection with the art whilst occupying the presidential chair. Digressing then for a brief space, he remarked that the old term of six or seven years' apprenticeship was too long a period to follow the short school-life of a boy of fourteen, though the three years now generally recognised as the appropriate length of time probably erred in the opposite direction, being too short for an apprentice to master the requirements of modern pharmacy. The majority of young men, under modern conditions, could not hope to obtain during their pupilage the knowledge required for the advanced examinations of the present time unless they depended entirely upon themselves for future success. They must fall behind in the race without improved education, and, without a thorough knowledge of the subjects upon which pharmacy is based, they could never expect to attain a very lofty position. To aid in raising the standard of pharmaceutical education the Boards of Examiners had gradually increased the stringency of the examinations. At the same time, though even good men might sometimes fail, no work was more conscientiously carried out than that of the examiners. It was a mistaken kindness to allow an inefficient candidate to pass, the duty of the examiners to such, no less than to the Pharmaceutical Society and, above all, to the public, demanding that a thorough knowledge of pharmacy in all its branches should be proved to exist in each case. Evidences of accidental or natural deficiency and a widespread system of "cram" were so frequently encountered that it was little wonder the percentage of failures at the qualifying examination was so large. It was no less essential to consider the adaptability of young men to the work of pharmacy than the other conditions which were almost exclusively regarded. The President then turned to the main theme of his address, treating of some common herbaceous plants especially connected with medicine. Special prominence was given to the noted 'Herbal' of John Gerard, written in the year 1596. Gerard, it was claimed, should occupy the first place in rank of those who cultivated herbaceous plants. Little had been done in that direction before his time, and he succeeded in growing more than a thousand species in a garden, the site of which was in the neighbourhood of the present Somerset House. But for the publication of his 'Herbal,' however, he would probably have been quite forgotten in later times, the fame of Shakespeare, Spencer, Bacon, and other famous individuals who flourished about the same time being likely to overshadow that of the mere cultivator of plants. After describing the rare volume at some length, and explaining the plan followed by the author in its compilation, Mr. Corder endeavoured to reclaim the early history of Gerard from the obscurity in which it is involved. He then spoke at some length of the different herbals published in England at an early period, by Clusius, Turner, Lyte, Dodoens and others, and reverting again to Gerard's, detailed some of the curious information contained in it, including the description of the development of the "barnacle goose." Consideration was next given to the herbaceous plants of greatest interest, with special reference to Gerard's acquaintance with them. Thus the hellebores, aconites, podophyllum, poppies and kindred plants, anemones, felworts, crocuses, snowdrops, irises, and daffodils, all received attention in turn, and the veteran botanist concluded his remarks on his favourite subject by insisting that, though a love of plants is inborn and circumstances may foster the taste, yet even a very superficial knowledge of botany cannot fail to prove of some value to all.

Vote of Thanks.

A hearty vote of thanks was proposed to the President for his address by Mr. Councillor Fitzhugh, J.P., of Nottingham, Chairman of the Local Executive Committee, who also took the opportunity of expressing indebtedness to the local chemists for assisting in making arrangements for giving a good welcome to the Conference. The motion was seconded by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch of the Pharmaceutical Society, who was charged by Mr. Young to express his deep regret at his inability to attend the meeting, and carried unanimously. The President having briefly responded, Mr. Naylor next read the report of the Formulary Committee.

Unofficial Formulary.

This report simply stated that the revision of several of the older formulæ and the introduction of some new ones had occupied the Committee since the publication of the last report. Careful chemical investigations had been necessitated in several instances, the outcome being certain of the papers presented to the Conference, and the issue of a new edition of the Formulary had therefore been deferred until full discussion of these subjects.

Report on Coto Bark.

Mr. W. Elborne then communicated a preliminary report which resulted from inquiries that had been instituted with the object of ascertaining the botanical origin of coto. Genuine coto bark was not often met with in commerce. There was, however, a more frequently occurring bark very analogous in physical appearance and structure, evidently closely allied botanically to the true coto, and termed paracoto bark. The latter does not contain the active principle (cotoin) of the true bark, and can only be distinguished from coto by a chemical analysis. Coto is said to come from Amazonas, paracoto from the banks of the Mapiri, the botanical origin of both being unknown. A specimen of genuine coto having been forwarded to Mr. F. F. Newcome, in Bogota, for recognition, a reply was received to the effect that the bark had been recognised there as "canelo," and was believed to be yielded by a *Drimys*, which grew near the coasts of the country (United States of Colombia) and of Venezuela. Upon reference to works on materia medica it was found that canelo (the Spanish for cinnamon) was a recognised term in Mexico and Chili for Winter's bark, *D. Winteri*. The structure of the latter being essentially different to that of coto, no reliance could accordingly be attached to the canelo clue, and it was abandoned. Strange to state, however, a second and totally different line of inquiry terminated in the same perplexing result, viz., *Drimys*. At the sixty-second meeting of the Deutscher Naturforscher und Aertze, held at Heidelberg, there was exhibited a collection of fine chemicals and recent rare plant derivatives, among which were two specimens labelled "cotoin," one obtained from Bolivian *coto-verum*, the other from a so-called coto bark that had been received from Venezuela. Specimens of the barks from which these cotoins had been extracted were also exhibited. The author obtained samples both of the cotoins and the barks. Bolivian *coto-verum* agreed with his specimens of genuine coto, whereas the bark from Venezuela proved to be genuine Winter's bark (*D. Winteri*, var. *granatensis*). The so-called cotoin that had thus been obtained from Winter's bark had been submitted to analysis. In melting point and qualitative reactions it agreed with the published reactions for cotoin from true Bolivian coto bark. A quantitative analysis had been made, when its percentage composition was found to differ from that of true cotoin by about one per cent. of carbon, the formula for cotoin being $C_{22}H_{18}O_6$, and that of the substance from Winter's bark $C_{21}H_{18}O_6$. These results were sufficiently interesting to warrant an extended investigation of the subject, which the author hoped to pursue. Having applied to the museum department of the Pharmaceutical Society for such information on the subject as might be available, Mr. E. M. Holmes, in reply, sent an account of various specimens of barks (dated 1851) in the Pereira and Hanbury collections, some of which even at that period had been confounded with Winter's bark, but were in reality genuine coto bark, only not at that time known under the name of "coto." The name coto for the bark originated in 1873. Owing to the prevailing opinion that coto is yielded by a lauraceous plant, the author drew attention to the fact that a large tree (*Laurus giganteus*), hitherto unknown to science, had quite recently been described in the *Pharmaceutical Journal* by Dr. Bayon, of Bogota. It was a native of a district not far from the coto yielding region, but its bark did not appear to have yet received attention. Sections of coto bark were exhibited, which had been cut by Mr. Abraham Flatters, of Manchester—forwarded to the author that morning by Mr. E. M. Holmes. The President, in inviting discussion, stated that, during his apprenticeship, a fellow apprentice marked a parcel of Winter's bark, that had just arrived, "Cabbage-tree bark, found somewhere to the north of Patagonia." Mr. Lake, of Exeter, said he believed he still had the specimen referred to by Mr. Corder. Mr. Gerrard remembered working with some ordinary coto bark, a few years ago, the cotoin obtained from which appeared to consist of a mixture of bodies. Mr. Naylor said it was interesting to know that Winter's bark yielded cotoin and, though this was not necessarily identical with that from coto, it might possibly be isomeric with it. Mr. Elborne, in reply, said that physiological experiments yet remained to be made, and he hoped soon to obtain a sufficient quantity of cotoin for that purpose.

Pharmaceutical Education in Nottingham.

Dr. Clowes, Professor of Chemistry in the University College, Nottingham, described the progress of pharmaceutical education in Nottingham during the past twelve years. He considered that it was a development of English methods which had been slowly and gradually evolved in the town, and the result was briefly described as embodying a three years' course of instruction which embraced pharmaceutical chemistry (theoretical and practical), botany, materia medica, dispensing, and physics. The system was not perfect, but was sufficient to show the possibility of decentralising pharmaceutical education, and combining satisfactorily the students' training with the business training of young pharmacists. Co-operation between the pharmacists and teachers in each centre was essential if the decentralisation was to become an accomplished fact generally, and this was fortunately secured in Nottingham. It was not too much to anticipate that, with the growth of a widespread and properly organised system of education, leading up to a suitably high examinational standard, the status of the pharmacist in England might be recognised as it was already recognised in continental countries, and many of the serious troubles that beset him might become things of the past. The President tendered the thanks of the meeting to Professor Clowes for his thoroughly practical paper. There was no need to discuss it, but it emphasised what had been already hinted, that the men who obtained their training at such colleges as that at Nottingham could easily be detected when they came into the examination room. The next two papers were considered together.

Collodium Belladonnæ.

Mr. R. Wright, referring to the unsuitability of the root extract for preparing the liquid plaster of belladonna, as pointed out by Conroy and J. C. Umney, and the consequent necessity for a revision of the Formulary recipe, expressed the opinion that the question of going back to the leaves as a source of extract should be considered. In the case of collodium belladonnæ, the chief objection to the use of the leaves did not apply, since the green colouring material was fixed by the collodion. He found that by repercolation it was possible to prepare a fluid extract of belladonna leaves strong enough to be used for the preparation in question. It should contain not less than ·5 per cent. of alkaloid.

Liquid Belladonna Plaster.

The paper on this subject, by Mr. W. A. H. Naylor, gave an account of observations he had made in the manufacture of this preparation, and suggested an improved process. It was assumed that an efficient process must satisfy the requirements of completely extracting the alkaloid of the crude drug and introducing it into the final product with a minimum of loss. Further, the solvent selected must admit of the active principles being dissolved in their natural state of association, and also withdrawing a maximum of extractive. In operating upon extracts, made with absolute alcohol and with alcohol of 94, 84, and 65 per cent., with a solvent consisting of 3 parts ether to 1 of spirit, it was found that this solvent did not answer the purpose of dissolving the alkaloid contained in the extract, more than half of it remaining undissolved. Better results were obtained by using a mixture of equal volumes of rectified spirit and ether, in which case the undissolved alkaloid amounted to from one-eighth to one-twelfth part of the quantity present in the extract. A preparation made from leaf extract according to the formula suggested by Mr. Linford was found to contain little more than half the active principle in the extract used. With the view of improving the process it was attempted to dispense with the making of an extract, and powdered belladonna leaves were treated with rectified spirit, by repercolation, so that one part by measure of the final product represented two parts by weight of the drug. The marc was then exhausted by percolation with spirit, and after distilling off the spirit an extract was obtained amounting to 304 grammes per pound of leaf, and containing 11·64 grains of alkaloid. The repercolation process had extracted only 55·68 per cent. of the alkaloid, and hence it did not seem probable that a preparation of a strength of 2 in 1 could be made by a direct method so as to contain anything approaching to the whole of the alkaloid in the leaves. That idea was therefore abandoned, and the first portion of the percolate was mixed with the extract obtained by distilling off the spirit from the latter portion, adding sufficient menstruum to make up the requisite volume of liquid extract. This was then mixed with ether and the other ingredients to make the liquid belladonna plaster. The liquid extract so prepared was found to contain 1 per cent. of alkaloid, and when mixed with an equal volume of ether, 0·439 per cent., that being apparently the largest proportion to be maintained in solution together with the remaining ingredients of the formula. The President suggested that the fluid extract of belladonna might possibly be replaced with advantage by a solution of atropine of definite strength. The subsequent discussion on the joint papers was a very extended one, Mr. Linford suggesting that the loss of alkaloid during percolation might perhaps be prevented by powdering the leaves sufficiently fine and then percolating with a mixture of two parts of ether with one part of spirit, after rendering them alkaline by ammonia. Messrs. Wrenn, Druce, Conroy, Ransom, Bird, Gerrard, Lake, and Wright also made a number of pertinent comments, to which Mr. Naylor replied at length, after which the Conference adjourned for luncheon.

Standardisation of Alkaloidal Tinctures.

Later, Messrs. Farr and Wright described the results of a research having for its objects to ascertain the suitability of the present alcoholic strength of tincture menstrua, to devise accurate and reliable methods for the determination of alkaloids, to find the average alkaloidal strength of tinctures prepared from genuine drugs, and to test the comparative value of several alternative processes for the preparation of the tinctures. The President said all must appreciate the value of this paper, and Mr. Gerrard spoke of his experience of the action of heat on alkaloidal matter. He also said it was of the highest importance that pharmacists should be able to keep their tinctures of definite strength. Mr. CONROY said he had learned a good deal from the various papers published by Messrs. FARR and WRIGHT, and he endorsed what had been said by them with regard to preparations from standardised drugs and extracts, as that method of procedure was distinctly a retrograde step.

Specific Gravity of Sandal Wood Oil.

Mr. M. CONROY concludes, as the result of a series of determinations, that the specific gravity of sandal wood oil as given in the British Pharmacopœia is too low in view of the fact that all likely adulterants are of lower density. In his opinion the minimum specific gravity should not be less than ·972 at 60° F. Mr. MACEWAN said this paper was very interesting, though it was mainly corroborative of previous work. It was gratifying to himself and other workers to find that Mr. CONROY agreed with them regarding the specific gravity of the oil. He thought any specimen as light as oil of lemon must be spurious, but the existing great differences in density were probably due to the age of the wood and the part employed.

Alkaloidal Strength of Hemlock Fruit.

Messrs. E. H. FARR and R. WRIGHT consider that the evidence afforded by the examination of authentic specimens of hemlock fruit warrants them in stating that if collection take place at the proper stage of development and the fruit be carefully dried it should yield about two per cent. of alkaloidal hydrochlorates. They suggest, therefore, that the tincture of the fruit should be standardised to contain 0·20 per cent. of conine or 0·25 per cent. of the hydrochlorate, the dose of the tincture then remaining the same as that of the one now official. After the reading of this paper the Conference adjourned for the day.

Visit to Guildhall.

According to the usual custom the ladies visiting Nottingham during the sitting of the Conference were invited to attend the opening meeting to hear the MAYOR'S welcome to the town and the PRESIDENT'S address. After luncheon they visited the Guildhall, under the guidance of Mr. Councillor FITZHUGH, J.P., who described the chief matters of interest there. Subsequently, the party proceeded to the Great Northern Railway Station to join the gentlemen in the excursion to Belvoir Castle.

Excursion to Belvoir.

A special train conveyed the visitors to Redmile, whence carriages conveyed them to Belvoir, where tea was served at the Peacock Hotel, after which the fine old castle, which is the property of the Duke of RUTLAND, was explored. Both this and the surrounding country excited general interest and admiration, and it was at a late hour that the return from Redmile took place.

Examination of Beeswax.

On Wednesday the first paper read was by Messrs. PARRY and ESTCOURT. The purport of this was to point out that to a large extent druggists were supplying adulterated beeswax, and the authors suggested that the Pharmacopœia might well give some fuller and more decisive tests than it does at present. In the discussion which followed the opinions were expressed that the adulteration referred to was probably not in all cases intentional, and that genuine beeswax could always be obtained if a proper price were paid for it, whilst foreign wax was as good as English for pharmaceutical purposes.

Easton's Syrup.

Mr. R. WRIGHT reviewed the various suggestions that have been made in regard to the making of this preparation, and after enumerating the defects to which it is liable, stated that most, if not all, the objections to it, and also to syrup of phosphate of iron, are due to an excessive acidity. His general conclusions are that ferrous phosphate is best prepared by the action of phosphoric acid upon metallic iron; that the use of the official syrup of phosphate of iron should be discontinued, and that the amount of sugar should be reduced to about ten per cent., as suggested by MARTINDALE and CLAGUE. A formula in accordance with these views was given.

Effervescent Caffeine Preparations.

Mr. LEWIS OUGH described the results of analyses of a number of samples which gave evidence of a remarkable variation in the amount of caffeine they contained. In some instances this was little more than one half as much as the preparations were stated to contain, while in others it was from two to nearly three times as much.

Pharmacy of the Thyroid.

Mr. EDMUND WHITE described at length the results of his experience in preparing the thyroid gland of the sheep for medicinal use, special consideration being devoted to preparations for administration by the mouth. The means employed for obtaining the glands and the precautions to be observed during the operation were first described and explained. Though the thyroids of other animals have been used in medicine, that of the sheep is generally preferred, and the author made some observations regarding the average weight of the organ in that animal. The preparations described were two forms of glycerin extract, a dilute alcohol extract, the proteids precipitated by the addition of absolute alcohol to the glycerin extract, and the precipitate produced by the addition of lime water to the glycerin extract after acidulation with phosphoric acid. The advantages and disadvantages of each method were described and the keeping properties of the various products, specimens of which were exhibited, discussed. The powder resulting when the precipitate produced in the last mentioned process is dried over sulphuric acid is the preparation regarded most favourably by the author, who is of opinion that the active principle of the gland, which is undoubtedly present in the powder, is probably of the nature of a ferment. Reference was also made in the paper to the administration of the entire glands, and some exact information given with regard to dosage. Specimens of the various preparations described were exhibited, together with a mixture consisting of table salt with two per cent. of the precipitated thyroid powder, intended for use when the cure of myxœdema is practically completed. This is to be taken with food to prevent relapse.

Papain.

Mr. F. **Davis** described the results of experiments on the digestive action of papain, the general conclusion being that it is active in neutral or weakly alkaline media, but that its action is entirely stopped by the presence of hydrochloric acid to the extent of 0·05 per cent.

Commercial Ipecacuanhas.

The next two papers were considered together. Mr. E. M. **Holmes** referred to the discrepancies in statements regarding the alkaloidal constituents of the ipecacuanhas of English commerce as indicating considerable uncertainty as to what the activity is really due, and the consequent necessity that exists for pharmacists to see that they obtain a root complying with the official description given in the British Pharmacopœia. He then directed attention to the varieties and qualities of the drug as met with in commerce, and gave details of the histological characteristics such as will enable spurious roots to be detected by the retail pharmacist, upon whom he insisted the main responsibility must rest of ensuring the supply of pure drugs to the public. In conclusion it was stated that, although it is comparatively easy to identify any of the spurious ipecacuanhas by their microscopical structure and external characters as viewed by a good lens, it is by no means easy to detect them when present as adulterants in the state of powder. This difficulty could only be obviated at present by pharmacists powdering the drug themselves.

Deëmetinised Ipecacuanha.

Mr. F. C. J. **Bird** referred to the conflicting results obtained by different investigators who have endeavoured to deprive ipecacuanha of its emetic property, and to **Kanthack** and **Caddy**'s statements with regard to the anti-dysenteric effect produced by the drug when freed from alkaloid (see *Pharm. Journ.*, [3], xxiii., p. 990). He then summarised the work done in the direction of removing the emetine without otherwise affecting the action of the drug, and suggested that a satisfactory process consisted in exhausting the finely powdered root by percolating with ammoniated chloroform, washing out the emetine from the solution with dilute sulphuric acid, returning the washed chloroform to the powder and, after mixing uniformly, drying the product. It was further stated that it would be useful to ascertain to what extent the chloroformic extract, freed from emetine, possessed antidysenteric properties. The **President** and Mr. **Conroy** objected to the last opinion expressed by Mr. **Holmes** as casting a slur upon wholesale druggists, but the position taken by the author was defended by Mr. **Strother**. Dr. **Paul** described the results of experiments performed by him with ipecacuanha, and stated that the so-called "emetine" was not a homogeneous substance, as he had extracted from it both a crystalline and an amorphous alkaloidal substance. He thought the difference in the yield of emetine from root and stem was simply due to the varying proportions of bark and wood.

Diastasic Action.

Mr. D. B. **Dott**, in his paper on "The Determination of the Diastasic Action on Starch," referred to the employment of this reaction for analytical purposes, described the usual methods adopted, and mentioned the resulting products. He then indicated objections to the iodine method of determination, and pointed out that, since the reaction of maltose with Fehling's solution is well defined, the determination of the quantity formed of this sugar would seem the best test of the extent of diastasic action. A large number of experiments that had been tried under varying conditions were then described in detail, and the general conclusions formed were that the diastasic value cannot be accurately determined by the amount of maltose formed, unless the starch solution is always prepared in the same way; that there would be great difficulty in fixing a standard method for the preparation of starch solution such as would ensure a constant result with the same proportion of diastase; that the method of testing for unaltered starch and erythro-dextrin with iodine is the best at present known for determining the diastasic action; and that by the action of malt extract on starch solution (2 per cent.) at 40° C., with one part of extract to five parts of arrowroot, the mixture should cease to give a distinct coloration with iodine after thirty minutes. Mr. **Grierson** said that the author appeared to have come to a conclusion, with regard to the value of the iodine method, which was just the opposite of that he expressed last year.

Purity of Lithium Salts.

Mr. H. **Bowden** communicated a brief paper on lithium carbonate, but stated that his analyses, owing to lack of time, were necessarily incomplete, and unrepresentative on account of their fewness. The methods described, however, gave an idea as to the process to be followed.

Lithium Nitrate.

Mr. D. B. **Dott** showed results that seemed in favour of the formula for lithium nitrate being $LiNO_3 \cdot 3H_2O$.

Even allowing for the difficulty of obtaining a deliquescent salt free from adherent moisture, the fact of the crystallised lithium nitrate being a simple tri-hydrate was said to appear most probable.

**African Copaiba.** Mr. J. C. Umney briefly summarised the results of a comparison of two samples of copaiba oleoresin imported from the Niger basin, with specimens of South American origin. In many respects they were found to correspond, and the African copaiba was probably derived from one of the *Copaifera* known to exist in tropical Africa. The next two papers were taken as read.

**$CO_2$ Apparatus.** Mr. J. H. Hoseason described a new form of apparatus for the gravimetric determination of carbonic anhydride, said to be cheap and useful.

**Washing Oxidisable Precipitates.** Mr. T. A. Forret described an improved arrangement by which a more rapid and thorough removal of soluble salt may be effected than by the apparatus described by him in the *Pharmaceutical Journal* of September 19, 1891.

**Bell and Hills' Bequest.** After the papers had all been read and discussed, the Formulary Committee was reappointed, and the President then presented the customary gift of books, in accordance with the terms of the Bell and Hills' bequest, and the volumes given by Mr. Thomas Hanbury, to be placed in the library of the local pharmaceutical association. These donations were briefly acknowledged in an appropriate manner by Mr. Fitzhugh.

**Place of Meeting in 1894.** In accordance with an invitation conveyed by Mr. G. C. Druce it was decided, after some discussion, that the Conference should meet at Oxford next year. The exact time will be decided by the Executive Committee.

**Election of Officers.** The election of officers for the ensuing year was the next business, and resulted in the following gentlemen being appointed :—

*President*—N. H. Martin, Newcastle-on-Tyne.

*Vice-Presidents*—Michael Carteighe, London; W. Hayes, Dublin; R. H. Davies, London; G. T. Prior, Oxford,

*Treasurer*—John Moss, London.

*Hon. General Secretaries*—W. A. H. Naylor, London; F. Ransom, Hitchin.

*Hon. Local Secretary*—H. Matthews, Oxford.

*Other Members of the Executive Committee*—C. A. Bolton, Nottingham; Peter Boa, Edinburgh; A. W. Gerrard, London; G. C. Druce, Oxford; J. Hodgkin, London; E. M. Holmes, London; J. C. C. Payne, Belfast; E. H. Farr, Uckfield; R. Wright, Buxton.

*Auditors*—John Wilford, Nottingham; W. Clayton, Oxford.

**Votes of Thanks.** Mr. Reeve, of Melbourne, then thanked the members of the Conference for entertaining him as the representative of the Pharmaceutical Society of Australasia and, afterwards, the usual votes of thanks were accorded with acclamation.

**Election of Members.** Several names were then submitted of gentlemen who sought election as members of Conference and, just as the meeting was closing, the President announced that a reply cablegram had been received from Chicago, in which Professor Remington congratulated the British Pharmaceutical Conference, on behalf of the American Pharmaceutical Association.

**Ladies' Excursions.** The ladies' programme for the second day of the meeting included a drive to the Arboretum and Church Cemetery in the morning, after which a visit of inspection was paid to Messrs. H. Mallet and Co.'s lace factory. After luncheon, the warehouses of Messrs. T. Adams and Co., and the Midland Lace Company, were visited.

**Drive to Wollaton Hall.** Later in the afternoon the whole of the visitors were driven to Wollaton Hall, the route taken being by way of the Lenton Boulevard and across Wollaton Park. Tea was there provided on the lawn, and the fine hall thrown open to inspection, by the kind permission of Lord Middleton.

**Smoking Concert.** On returning to Nottingham the company once more assembled at the Exchange Hall, where the members held their customary smoking concert, whilst the ladies, by invitation, met Mrs. Fitzhugh at a Drawing Room, and spent a musical evening. The entertainment was far above the usual standard on such occasions, and the attendance was very large.

**Visit to Welbeck.** On Thursday morning, at nine o'clock, the members of the Conference and their friends left Nottingham by train for Mansfield, whence they were driven through the "Birklands" to Welbeck Abbey, which they were privileged to inspect by permission of the Duke of Portland. Luncheon was served at half-past one and, after both house and park had been explored, the party returned by way of Edwinstowe to Mansfield, where they were entertained at tea, in the Town Hall, by the Mayor, Mr. Alderman Douglas J. Patterson. At half-past eight the return train left Mansfield for Nottingham, and thus concluded a meeting which has probably had no superior since the Conference was first formed. The arrangements made by the local executive were exceptionally smoothly carried out, and Mr. Councillor Fitzhugh, Mr. C. A. Bolton, Mr. W. Gill, and other members of the committee, together with the local ladies who assisted them, deserve special commendation for their untiring efforts on behalf of their visitors.

### BACTERIA AND COLDS.

According to the Berlin correspondent of the *Lancet*, Professor Schenk has found that micro-organisms move towards warm points. This movement he terms thermotaxis, and he concludes, as the result of experiments with a specially constructed apparatus, that warmth acts as a stimulant on micro-organisms, which move towards a warm body in their neighbourhood, and that this thermotaxis is a vital property of bacteria. The professor further considers that in certain cases of "catching cold" an infection is conveyed by bacteria. Thus a person entering a cold room would attract the bacteria present by his warm body, and these, finding admission through the skin or otherwise, produce, after a certain time of incubation, the results ordinarily attributed to "catching cold." The hair bulb sheaths, sweat glands, and mucous membranes are all said to offer possible points of entry to bacteria.

### MEDICAL MEN AND LIMITED COMPANIES.

In connection with the matter referred to last week (see *ante*, p. 126), the *Lancet* remarks that the fact that even a few members of the medical profession should have so misconceived their duty is sad indeed, and that they must feel they have placed the profession in a discreditable and contemptible light in a way that admits neither of excuse nor palliation. The *British Medical Journal* says it can hardly be doubted that some further action will be taken by the General Medical Council or the Colleges, "for it would be difficult to find an action more 'infamous in a professional respect' than the taking of bribes for professional recommendation."

### UNIVERSITY SUCCESS.

At the recent intermediate examination in science of the University of London, Mr. E. F. Harrison, the Assistant Lecturer in Chemistry at the Society's School of Pharmacy, was successful in satisfying the examiners, and his name appears in the first division of the pass list. Mr. Harrison was a Bell Scholar in 1890, and, during the following session, won the Pharmaceutical Society's bronze medal, medals in chemistry and materia medica, and several certificates of honour. He afterwards worked for some time in the Research Laboratory, under Professor Dunstan, and, on the retirement of Mr. T. S. Dymond last year from the post of Assistant Lecturer in Chemistry, was appointed to succeed him.

### INTERNATIONAL MEDICAL CONGRESS.

This meeting, which was to have commenced on the 24th of next month, has been postponed till April, 1894. All the arrangements were in a far advanced stage of preparation, but it is understood that, in view of a possible epidemic of cholera, it has been considered wiser to delay bringing together the large number of visitors expected.

### HONOUR FOR DR. GILBERT.

It is announced that the honour of knighthood has been conferred upon Dr. J. H. Gilbert, F.R.S., who has been, for more than fifty years, associated with Sir J. B. Lawes in the agricultural experiments at Rothamsted.

# British Pharmaceutical Conference.

## MEETING AT NOTTINGHAM.

The thirtieth annual meeting of the British Pharmaceutical Conference commenced its sittings for business on Tuesday morning, August 15, in the Borough Council Chamber, Exchange Hall, Nottingham, under the presidency of Octavius Corder, Esq.

At ten o'clock Mr. Anderson Brownsword, Mayor of the borough, opened the proceedings by formally welcoming the Conference to Nottingham. He said he was very glad that he was able to say "Ladies and gentlemen," because it was not always at a conference of that nature that they were treated with the presence of the fair sex. He was sure it would add increased zest to the labours of the gentlemen, and would also materially add to their enjoyment. His duties were very brief that morning. He was there merely for the purpose of bidding that Conference a hearty welcome to the town of Nottingham. The body of which they were representatives was to his mind one of the greatest importance. Scarcely any of them knew how much they depended upon the ability and skill of the chemist. Every day some of them had to go to him for treatment, or for medicine to be made up, and it was of vital importance that none should occupy the position of chemists and dispensers who were not thoroughly qualified for the post. The clerk of the weather had given them a most warm welcome, and he trusted they would find the hearts of the people of Nottingham had not only responded to his invitation as it were, but had outdone it and given them quite as cordial a welcome on their own account. He was sure that nothing would be left undone by the local committee to make the visit a successful one. He was glad to learn that the conversazione held on the previous night at the Castle was so great a success, although he regretted he was unable to be present, having returned only late on the previous evening from a short holiday at the seaside. But if not with the members of that Society personally, his sympathies were with them, and he was pleased to know that his friend, Mr. Fitzhugh, had acted in his place, and had made every possible preparation for the comfort of the visitors. Twenty-seven years ago, when the Society last visited Nottingham, the offices of local vice-president and secretary were filled by personal friends of his, but both had now passed away to the great majority. However, he was glad to find that one of the positions was filled this year by Mr. Fitzhugh, and the other by a gentleman whose work as secretary would, he was sure, be appreciated by all. He was glad to find from the programme that the bodily comfort and welfare of those attending the Conference had been so well provided for. That was an important point, when many of the members were, like himself, approaching middle life, and he trusted that the programme, as arranged, would be carried through, so that the members would be able to look back upon that visit to Nottingham as one of the most agreeable in the history of the Society. As chief magistrate of the town, he bid them all a hearty welcome, and trusted that the meetings would be attended with great success.

The President thanked the Mayor most heartily for the kind welcome he had given them and for coming amongst them, and also thanked the local committee for the manner in which they had provided for the entertainment of the visitors.

### Reception of Delegates.

Mr. W. A. H. Naylor (Hon. Sec.) then read the following list of delegates:—

*Pharmaceutical Society of Great Britain.*—Messrs.

W. G. Cross (Vice-President), Abraham, Allen, Atkins, Gross, Johnston, Leigh, Newsholme, Richardson, Schacht, Southall, Storrar, and R. Bremridge (Secretary).

*North British Branch.*—Messrs. J. Laidlaw Ewing, P. Boa, W. L. Currie, D. B. Dott, J. Jack, J. Johnston, C. Kerr, A. Kinninmont, R. McAdam, J. Paterson, D. Storrar, and J. R. Hill (Assistant Secretary).

*Pharmaceutical Society of Ireland.*—Messrs. G. D. Beggs, H. Conyngham, J. C. O. Payne, and W. F. Wells, Junr.

*Aberdeen and North of Scotland Society of Chemists and Druggists.*—Messrs. Johnston, Kay, and Paterson.

*Brighton Association of Pharmacy.*—Messrs. M. Leigh, W. W. Savage, and L. B. Hardcastle.

*Edinburgh Chemists' Assistants' and Apprentices' Association.*—Mr. W. Duncan.

*Glasgow Pharmaceutical Association.*—Messrs. W. L. Currie and R. C. Rait.

*Hull Chemists' Association.*—Messrs. C. B. Bell and J. S. Linford.

*Liverpool Chemists' Association.*—Messrs. J. Bain, M. Conroy, J. R. Day, J. Hocken, J. Smith, C. Symes, W. Wellings, and A. S. Buck.

*London Chemists' Assistants' Association.*—Messrs. E. F. Harrison, H. A. D. Jowett, F. A. Rogers, J. C. Stead, and J. Strother.

*North of England Pharmaceutical Association.*—Messrs. T. Maltby Clague and J. Harrison.

*Manchester Pharmaceutical Association.*—Messrs. Benger and Kemp.

*Midland Pharmaceutical Association.*—Messrs. C. Thompson, R. D. Gibbs, G. E. Perry, F. H. Prosser, W. Hulton, and M. Magor.

Mr. F. Ransom announced that letters of apology for non-attendance had been received from Messrs. N. H. Martin (Newcastle), Strachan (Aberdeen), Umney, Hayes (Dublin), Atkins, Dott, Reynolds, Schacht, Groves, R. H. Davies, Hodgkin, Martindale, Stanford, Boa, Holmes, and Maben. He said that Messrs. Martin and Martindale were visiting the International Conference in Chicago, and he read Mr. Reynolds' letter, in which he expressed his great regret that by his doctor's orders he was forbidden to leave home, especially as Mr. Corder, the President, was his oldest friend.

### REPORT OF THE EXECUTIVE COMMITTEE.

Mr. Naylor then read the report of the Executive Committee and the Financial Statement as follows:—

### *Report of the Executive Committee.*

The Executive Committee, in presenting the thirtieth annual report to the members of the British Pharmaceutical Conference, congratulates them on the continued success of the Association. There is no indication of any decline in the interest taken in the work of the Conference. In looking back over the thirty years of its existence your Committee feels that there is abundant evidence that the objects for which it was founded have been promoted, and that there is sufficient reason to warrant the belief that an equally useful and important future lies before it. At the meeting held last year in Edinburgh a resolution was passed declaring that the Conference in future should not of necessity meet in the same town or at the same time as the British Association. The effect of this resolution is to emphasise the fact that the Conference is at liberty to meet at whatever time and place may seem most desirable.

During the past year the Conference has lost by death a distinguished honorary member, Dr. Soubeiran, Professor of Pharmacy at Montpellier, France. Your Committee has also to record with deep regret the death of Mr. Samuel Gale, which occurred in March of the present year. Mr. Gale was an acknowledged authority on pharmaceutical matters, and his long experience on the Board of Examiners of the Pharmaceutical Society of Great Britain brought him into contact with a large body of pharmacists, by whom he was universally esteemed.

The Blue List has been subjected to some slight revision, and contains suggestions for research work on subjects which, it is believed, would amply repay investigation. A grant of £5, in aid of research, has been made to Mr. W. Elborne, B.A., F.L.S., to defray expenses connected with an investigation of coto bark, a first report on which will be read at the present meeting.

Mr. R. A. Cripps, F.I.C., who was the recipient last year of a further grant of £5 to assist in carrying out his investigation on ipecacuanha, reports that his work is progressing, but is not sufficiently advanced for publication, and therefore asks for an extension of time.

The end of June marked the resignation of Mr. M. K. Johnson as Assistant Secretary, a step necessitated by his entrance into business on his own account at a considerable distance from London. His past service was appropriately acknowledged at a meeting of the Executive by the passing of a formal resolution in terms that recognised his fidelity and devotion to the interests of the Conference, and expressed the thanks of the Committee. It is a pleasure to be able to state that Mr. J. C. Nightingale, who formerly occupied the position for several years, has been appointed to fill the vacancy.

Mr. Louis Siebold, F.I.C., F.C.S., was re-appointed editor of the 'Year-Book,' and the MS. of parts I.—IV. inclusive is now in the hands of the printers. Arrangements have been made by which the earlier publication of the volume is assured.

The papers to be read at the meeting are fewer than they have been for some years past, but it is confidently believed that the quality is such that they will provide suitable matter for profitable discussion.

The reception by the President was held in the Castle Museum and Art Gallery last night, and this, with the conversazione which followed, proved as usual an attractive commencement to the business of the Conference.

Your Committee announces with sincere regret that, owing to ill-health, Mr. R. H. Davies, F.I.C., F.C.S., has felt compelled to resign the office of Treasurer. In accepting his resignation the Committee placed on record its high appreciation of the important service he has rendered the Conference. The Senior Secretary was instructed to convey the resolution, and at the same time to express the hope that Mr. Davies might soon be restored to his accustomed health.

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Mr. Wilford, one of the auditors, having certified that the accounts were correct,

The President moved the adoption of the report and accounts.

Mr. C. Thompson (Birmingham) seconded the motion, which was at once put and carried unanimously.

The President then suggested that a cablegram of congratulations should be sent to the Conference in Chicago, which was carried by acclamation.

### *Visitors.*

The President said there were two visitors from abroad present, Mr. Alfred Reeve, of the Pharmaceutical Society of Victoria, and Mr. Mager, of the Board of Examiners at Cape Colony. The Conference was pleased to welcome both these gentlemen, and if Mr. Mager had any remarks to make, he was sure they would be appreciated.

Mr. Mager said it gave him great pleasure to be present, but he had not expected to be called on to

## FINANCIAL STATEMENT FOR THE YEAR ENDING JUNE 30, 1893.

### THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

| July 1, 1892. *Dr.* | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| To Assets forward from last year— | | | | | | |
| „ Balance in hand at Bank | | | | 56 | 19 | 2 |
| „ Cash in Secretary's hands | | | | 1 | 15 | 6 |
| „ Messrs. Churchill's Account | | | | 97 | 5 | 8 |
| June 30, 1893. | | | | | | |
| To Sale of Year-Book by Publishers | | | | 17 | 13 | 4 |
| „ Advertisements, 1892 volume | 88 | 5 | 10 | | | |
| „ „ 1891 „ | 2 | 2 | 6 | | | |
| | | | | 90 | 8 | 4 |
| „ Members' Subscriptions, Amount received from July 1, 1892, to June 30, 1893 | | | | 462 | 2 | 4 |
| „ Index Book, Sales by Publishers | 0 | 2 | 4 | | | |
| „ „ Secretary | 0 | 7 | 6 | | | |
| | | | | 0 | 9 | 10 |
| „ Liabilities on Outstanding Account, Messrs. McCorquodale and Co. | | | | 3 | 4 | 6 |
| „ Unofficial Formulary, Sales by Publishers | | | | 4 | 10 | 0 |
| | | | | £734 | 8 | 8 |

| June 30, 1893. *Cr.* | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| By Expenses connected with Year-Book:— | | | | | | |
| Printing, Binding, Publishing, etc. | 296 | 13 | 10 | | | |
| Postages and Distributing | 32 | 19 | 10 | | | |
| Advertising and Publishers' charges | 24 | 14 | 1 | | | |
| Editor's Salary | 150 | 0 | 0 | | | |
| Foreign Journals for Editor | 5 | 18 | 6 | | | |
| | | | | 510 | 6 | 3 |
| „ Unofficial Formulary:— | | | | | | |
| Advertising | 1 | 14 | 6 | | | |
| Publishers' Commission | 0 | 9 | 0 | | | |
| | | | | 2 | 3 | 6 |
| „ Sundry Expenses:— | | | | | | |
| Expenses of Assistant Secretary at Edinburgh | 10 | 0 | 0 | | | |
| Copies of President's Address | 0 | 15 | 0 | | | |
| | | | | 10 | 15 | 0 |
| „ Assist. Sec.'s Salary from July 1, 1892, to June 30, 1893 | 42 | 10 | 0 | | | |
| „ Rent of Office | 10 | 0 | 0 | | | |
| | | | | 52 | 10 | 0 |
| „ Blue List, Printing | 3 | 4 | 6 | | | |
| Postages | 2 | 15 | 9 | | | |
| | | | | 6 | 0 | 3 |
| „ Postages | | | | 12 | 9 | 2 |
| „ Printing and Stationery | | | | 9 | 15 | 6 |
| „ Bank Charges, as per Bank Book | | | | 0 | 10 | 0 |
| „ Petty Cash Expended | | | | 5 | 3 | 10 |
| „ Liabilities of last year, since paid | | | | 3 | 5 | 6 |
| „ Outstanding Assets—Messrs. Churchill's Account | | | | 85 | 16 | 5 |
| „ Balance at Bank | 34 | 10 | 7 | | | |
| „ Balance in Secretary's hands, for Postage, 10*d.*; Petty Cash, 21*s.* 10*d.* | 1 | 2 | 8 | | | |
| | | | | 35 | 13 | 3 |
| | | | | £734 | 8 | 8 |

### *THE BELL AND HILLS FUND.*

| | | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| 1892. July 1. | To Balance in hand | 16 | 1 | 10 | | | |
| | „ One Year's Dividend on Consols | 9 | 13 | 4 | | | |
| | | | | | 25 | 15 | 2 |
| Aug. 4. | By Purchase of Books for Edinburgh | | | | 11 | 1 | 5 |
| | | | | | 14 | 13 | 9 |
| | Assets— | | | | | | |
| | Cash—Balance at Bank | | | | 14 | 13 | 9 |
| | Consols | | | | 360 | 0 | 0 |

Audited and found correct { T. THOMPSON, Edinburgh.
J. WILFORD, Nottingham.

say anything at that stage of the proceedings. The Pharmacy Board of the Cape of Good Hope had been established for two years, and consisted of five members elected from the duly registered chemists at the Cape. He had no doubt he should profit from the discussions, and take back much useful information.

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The PRESIDENT then delivered his address.

### THE PRESIDENT'S ADDRESS.

My friends, I thank you for the courtesy which has prompted you to elect me as your President this year, the more so as I am fully aware that there are many men better qualified to fill the office, and many who could have given you an address more worthy of your acceptance. I find, as others must have done, that every year increases the difficulty of choosing a subject suitable for the occasion, as each former President has well nigh exhausted every topic bearing upon pharmaceutical interests. Knowing that much time will be taken up in listening to the many and varied papers which have, I presume, been prepared for this Conference, and the discussions which will necessarily follow, let me remind you of the old adage, "That speech is silver, and silence is gold." This week, in the first place, I must inform you is my jubilee. Fifty years ago I entered upon a term of six and a half years' apprenticeship to obtain a knowledge of pharmacy. Fifty years, roughly speaking, mean in human life nearly a generation and a half, and in that period of time so many changes have taken place that the London Pharmacopœia of 1836, which was then in vogue, is a text-book of a very different character to the Pharmacopœia now in use, which is our standard of British pharmacy.

In those old-fashioned days of fifty years ago, a lad of fourteen would be apprenticed; by the way much too early an age to study the mystic sign on a specie jar of the Apothecaries' Company, with its one-horned rhinoceros. What that beast has to do with physic I cannot to this day determine, but the world-wide motto "Operque per orbem dicor" must be patent to all. Whilst on the subject of apprenticeship, I would remark that the old term of six or seven years was too long a period to follow the short school-life of a boy of fourteen, or fourteen and a half. At the same time, I am by no means sure that the present recognised time of three years does not err on the other hand as too short an apprenticeship to master the requirements of modern pharmacy. For instance, a youth leaves school at the present time at sixteen, and by tacit agreement his indentures are cancelled at the age of nineteen; at this age he is too young to obtain a situation in a first-class establishment, consequently he must be content to enter as a junior, a second or third rate one, where, let it be remembered, there is no sort of obligation to instruct, nor is there time for him to do more than to attend to the duties of his situation. How then, can the majority of such young men, under these circumstances, hope to obtain the knowledge required for the advanced examinations of this present time? Their future success, as we know, must depend entirely upon themselves. With an improved education much can be done, without it they must fall behind in the race. Raising the standard must of necessity improve the position, but without a thorough knowledge they can never expect, so to speak, to be more than "hewers of wood and drawers of water." For this reason the Board of Examiners have gradually increased the stringency of the examinations so as to meet more fully the exigency of the case. I am aware that in all examinations good men may and do sometimes fail, and indifferent ones occasionally pass, but taken as a whole, I believe no work is more conscientiously carried out than that of the Board, of which I have been so long a member. It is a mistaken kindness to pass an unprepared student. Their duty to the candidates, to the Pharmaceutical Society, and above all to the public interest of the demand that he should possess a thorough knowledge of pharmacy in all its branches. A deficient early education, a naturally unfitted aspirant for this work, a widespread system of cram have very frequently to be encountered by the Board, so that it is not to be wondered at that sixty or seventy per cent. fail, and even then it is not certain that the result has been "a survival of the fittest." Young men are apprenticed to the business of a chemist because it is thought to be genteel (what a hateful word that is), or that the work is easy and the capital required comparatively small, without duly considering his adaptability for the work.

The subject I have taken for my address is on some herbaceous plants in common cultivation, especially those connected with medicine. I shall offer no apology for choosing this subject, because in the first place I know you will allow me perfect freedom in the matter, and secondly, it does not appear to have been chosen by any former President of the Conference. For this purpose I must take you back to the year 1596, when John Gerard wrote his wonderful 'Herbal.' I feel, in justice to him, that we must give him the first place in the rank of those who cultivated herbaceous plants, for we must remember that before his time little had been done in that direction. We cannot but feel the greatest admiration for one who succeeded in growing more than a thousand species of these plants in his own garden, somewhere near where Somerset House stands. We look in vain for the site of this interesting old garden, but we can easily imagine the intense interest he displayed in the growth of his treasures, the result of his long tried labours. In those days there were no selected catalogues of hardy or other plants, so that Gerard had to thank himself for the collection of plants which, only by immense pains, he was able to get together. Yet is it not to be wondered at that so little notice was taken of him at the time, and that were it not for his 'Herbal' he would probably have passed altogether out of sight, when we remember the host of English worthies who flourished in these halcyon days, such men as Shakespeare, Spencer, Bacon, Cecil Burleigh, Essex, and Raleigh. So we can understand that a mere cultivator of plants would be overlooked in the presence of such great minds.

The bibliophyle, however much he may prize "the small rare volume, black with tarnished gold," will scarcely consider his library complete unless it contains a herbal, and from a long list of such books he would probably choose that of Gerard as the best to adorn his shelves, provided always that he could secure the right edition. This very handsome folio is a fine example of this class of literature, containing, as it does, over 1600 pages of closely printed and almost perfect letterpress, with more than 2000 woodcuts, which, in spite of the early date at which they were produced, could hardly be improved on at the present time with modern appliances. The edition, which, in a collector's opinion, would be considered the "right" one, is dated anno 1633, and is described as follows:—"The Herball or Generall Historie of Plantes. Gathered by John Gerarde of London, Master in Chirurgerie. Very much enlarged and amended by Thomas Johnson, Citizen and Apothecarye of London. London, printed by Adam Islip, Joice Norton, and Richard Whitaker. Anno 1633." As frontispiece it contains a very fine example of the florid style so characteristic of folios of that period, and is the work of John Payne. At the top are figures of Ceres on the one hand and Pomona on the other, below these, on either side of the title, are figures of Theophrastus and Dioscorides, facing one another. At the bottom is a portrait of the author holding in his hand the recently introduced potato plant. Although practically unshaded, the drawings are perfect in outline, and the characteristics of each plant are shown with a fidelity and simplicity which enables them to be easily identified; simplicity is a great feature throughout the book. The plan which the author follows to describe each class of plants or even individuals is very definite, first giving an account of the plant under some characteristic heading, which, though it may differ very materially from modern classification, was better adapted to the scanty knowledge of the seventeenth century. Then he gives the habitat and various local and foreign names, finishing with the time of flowering and the various medicinal qualities; of these last he found some for every plant. Many old-fashioned names frequently crop up in his descriptions which may still be occasionally met with in some out of the way corner of England or Wales. For example, "dwale" for deadly nightshade is still used in Devonshire, and Norfolk country people still speak of pumpkins as "millions" and call the holly "hulver." One might multiply instances of these old forgotten names so common three centuries ago, the derivation of which is often very difficult to trace. In many instances they are corruptions of the Latin nomenclature of the monks; one can hardly account for the local name of "sencion" for groundsel, except as a corruption of Senecio, which was probably derived direct from the monasteries.

The 'Herbal' is divided into three books, comprising the whole vegetable kingdom known at that time; these books are divided into upwards of 800 chapters, which, considering the period at which they were written, may be looked on as taking the place of genera. The first book contains all grasses, grains, rushes, reeds, flags, and bulbous rooted plants; the second, all herbs used as diet, physic, or for ornament and pleasure; the third, trees, shrubs, fruit-bearing trees, resins, gums, roses, heaths, mosses, mushrooms, and sea plants. The misspelling of the author's name on the title-page must be a printer's error. His friends knew him as Gerard, and his coat of arms proves him to be connected with the Gerards of Isley, who did not use a final "e" in their name.

The early history of Gerard is very obscure. He was born at Nantwich in 1545, and educated at Willaston, a village some two miles from that town. It seems very probable that his education was completed there, and that he took up medicine at a very early age. He certainly travelled abroad to some extent, and knew something of Sweden, Denmark, Poland, and Russia, joining a trading vessel to the Baltic, and acting as medical attendant to the crew. He appears to have been familiar with the Mediterranean, and may have made a voyage to that neighbourhood in the same capacity. In 1562 he was apprenticed to Alexander Mason, a Warden of the Barber Surgeons' Company. His connection with the Company dates from this period, and was always a more or less important one. He was made a freeman on Decemoer 9, 1569, and though there is no record of his being admitted to the livery of the Company, he is mentioned as a member of the Court of Assistants in 1595, and Junior Warden in August, 1597. Between these dates "he suffered from a most grievous ague, and of long continuance," though it does not appear to have interfered with his work. In August, 1608, he was elected Master of the Company; the books, however, are missing for that period, and there is little or no record of his office. He died in February, 1611 or 1612, and was buried in St. Andrews, Holborn, but no monument marks the spot, even its position being unknown. He must have settled in London some time before 1577, since in 1597 he speaks of having superintended the gardens belonging to Lord Burleigh in the Strand, and also in Hertfordshire, for twenty years, and that this work had taken up nearly all his time, therefore he can hardly have practised as a medical man to any great extent after leaving Alexander Mason. Previous to his election as a member of the Court of Assistants he had already acquired a reputation as a skilled herbalist. His connection with Lord Burleigh's gardens gave him ample opportunity to follow his favourite study, and it was largely due to his energy that Lord Burleigh's collection of plants surpassed that of any other nobleman in England, many of them being exotics obtained by Gerard. About this time he appears to have had a house in Holborn, connected with which was a large garden; here he succeeded in growing a great variety of species, both indigenous and exotic.

One can hardly reconcile this quaint old herbaceous garden with the modern ebb and flow of traffic in Holborn. Holborn was then in the outskirts of London on that side, and capable of producing much that would hardly flourish there at the end of the nineteenth century. In the time of Richard the Third there were large gardens connected with the Bishop of Ely's palace, in the neighbourhood; Shakespeare records the fact in Richard the Third by making Gloster say "My Lord of Ely, when I was last in Holborn I saw good strawberries in your garden there, I do beseech you send for some." This same Bishop of Ely was John de Kyrkeley, who in 1290 bequeathed to the bishopric of Ely all his houses at Holborn in the suburb of London, together with vines, gardens, and other appurtenances in pure and perpetual alms; these gardens are now known as Ely Place. Dr. Sharpe, in the 'Calendar of Wills,' mentions that the gardens attached to the palace, which survive only in the name of Hatton Garden, were a characteristic feature of the neighbourhood. Vine Street still bears witness to the Bishop's vineyard, as Kirby Street still recalls the Bishop's name. Dr. Bulleyn visited Gerard's garden, and he mentions having seen 1100 varieties of foreign and domestic plants. Dr. Pulteney also says that he saw there 1033 species, though one cannot help thinking that some of these must have been varieties; anyway it was one of the earliest botanic gardens in Europe.

In 1596, Gerard printed a list of plants which he had cultivated, this being his first literary effort. Considering the carelessness with which it was printed and the scarcity of the volume (only one being in existence, that in the Sloane collection) it seems very probable that this last was only intended for private circulation, or for his own particular use. This is the first known catalogue of any public or private garden in England, and has therefore an interest beyond its rarity as a book. A folio edition appeared with English and Latin names in opposite columns in 1599. Gerard was a great advocate for the purchase of a piece of ground for the cultivation and study of medicinal plants, and strongly urged the Company to buy some land for that purpose. A spot in East Smithfield was chosen, but found unsuitable, and it seems just possible this piece of ground may have been Gerard's own garden, in Fetter Lane. Some money was subscribed for this scheme, but though one or two meetings were held on the subject of "Mr. Gerard's Garden," no active steps were taken, and the idea apparently fell through. In December, 1597, he published (it is said at his own risk) the folio which has made his name famous, the 'Herbal,' dedicated to Lord Burleigh. The evolution of this work is an extremely interesting story in the making of such books.

Botany as a science was first recognised by Aristotle, who may be looked on as its founder. The remains of his own writings and those of his school so frequently show a decided knowledge of plants, that it is quite evident they must have been well versed in the vegetable physiology of that day. Theophrastus, a worthy disciple of so great a master, succeeded to his chair, and wrote several books on the history of plants, but apparently he had no idea of classification, since he does not appear to have been acquainted with more than four hundred species in all; such being the case, a classification was hardly necessary. He devoted much attention to the functional difference of organs, the forms of leaves, the peculiarities of the leaf stalk, and was the first to point out the great differences between the wood of palms and that of exogens. He also understood the importance of leaves in the life history of plants. Botany made slow progress until the reign of Nero, when Dioscorides, the Greek physician, wrote a treatise on materia medica, but of the 600 plants he mentions the vagueness of description prevents the recognition of more than 400. In his time, however, the sexuality of plants is spoken of in positive terms; this fact Aristotle had refused to accept. Grafting and budding were also well known in Greece and Rome in the first century of our era, and gardening must have been a favourite pastime in Southern Europe, at this early period, to quote from a recent essay: "The garden seems the one spot on earth where history does not assert itself, and no doubt when Nero was fiddling over the blaze of Rome there were florists counting the petals of rival roses at Poestum as peacefully and conscientiously as any gardeners of to-day." Under the later emperors followed by the Byzantine princes art and science generally decayed, leaving only a mass of falsehood and superstition, and so from the death of Dioscorides until the beginning of the sixteenth century scarcely any addition was made to botanical knowledge in Europe.

The first herbal in English was the 'Grete Herbal,' published in 1516 by Peter Treveris, and formed the basis on which all that followed were more or less founded. A little later the Bernese physician, Otho Brunsfels, published his 'Herbarium Vivœ Eiconis.' Previous to its publication the writings of the Arabian herbalists were taken as the text-books for the schools, full as they were of false translations and exaggerated superstitions. Brunsfels appears to us as the Luther of botany, and as the earliest writer who was honestly determined to purify the degraded science, and lift it to its proper position. The Germans or Dutch were the first to illustrate their descriptions of plants, and Brunsfels was greatly instrumental in perfecting that which afterwards became a very prominent feature in the botanical literature of the period. Interest in the reviving science spread very rapidly, and the knowledge of species became much enlarged, to such an extent, in fact, that compilers became necessary to collect the numerous writings on botanical subjects which were scattered through much of the scientific literature of the early part of the sixteenth century. The first of these compilations was made by Conrad Gesner, of Zurich, often spoken of as the German Pliny, who introduced the system of dividing plants into classes, genera and species by distinctions derived from differences in the flower and fruit. Among many great names which occur during the sixteenth century, such as Dodoens, Clusius, Matthias de l'Obel, Gerard and others, we find that of William Turner, the father of English botany. He was born at Morpeth in 1538, and after many wanderings on the continent in consequence of his voluntary exile from England, he ultimately took his degree at Ferrara, and attended the lectures of Ghinus at Bologna. This eminent doctor first started a separate chair for botany, and was the means by which a medicinal garden was founded at Bologna. Turner then went to Switzerland and formed a friendship with Gesner, the compiler, who thought very highly of him. He returned to England, and published his 'Herbal' in 1568.

Following in the footsteps of Turner, Henry Lyte published a work in English which was professedly a translation from the French version of the Dutch 'Herbal' of Dodoens, this same work forming the groundwork of Gerard's book later on. Lyte described 1050 species and figured 870; most of Turner's illustrations were utilised by him, the remainder being some that appeared in a subsequent work by Dodoens. These illustrations also proved very useful to Gerard. Lyte appears to have entirely used a translation of Dodoens by Clusius, and was not by any means an original writer in botany. He was followed by l'Obel, who contributed a great deal to materia medica and botany, especially the former. He travelled over much of England plant hunting, and added largely to the number of known species. Under the patronage of Lord Zouch he superintended a physic garden at Hackney, and introduced into England many new exotics. Towards the latter end of the sixteenth century botanists generally felt the want of a trustworthy and comprehensive herbal. That of Dodoens had appeared in 1560, Lyte's translation was published in 1583, but was very erroneous, and Turner's book was practically obsolete.

John Norton, printer to the Queen, had commissioned a Dr. Priest to translate Dodoens' book into English; unfortunately he died before he had completed the task, and by some means the manuscript fell into Gerard's hands, who determined to use it, though there seems little doubt that he did not know sufficient botany for the task, Johnson, who was the editor and collator of this book, says that Gerard was quite incapable of writing a trustworthy herbal. The facts probably are that he used Dr. Priest's manuscript, and to disguise the fact altered the original arrangement of Dodoens to that followed by l'Obel. He denied any knowledge of the work written by Dr. Priest, saying that he had heard of such a man who had been working at a translation of a herbal, but that being dead, his work must have perished with him. The blocks were mostly obtained by Norton from Frankfort. Gerard certainly displayed great ignorance in the original work by misplacing many of the illustrations, and l'Obel, who was asked to correct it, went so far as to say he found in it over 1000 errors; at this point, however, the author stopped criticism by refusing to allow further alteration, saying that the book was quite accurate enough, and that the critic had forgotten his English. In 1597 the 'Herbal' was published; however the author may have obtained his material, and whether he ever acknowledged it in the proper way, will not alter the fact that it was vastly superior to any previous publication on botany, and represented an enormous amount of time and labour. Thus in a very sketchy way I have endeavoured to trace the course by which this very remarkable book came to be written. Many names which influenced the great revival in the science of botany during the sixteenth and seventeenth centuries might and ought to be mentioned, but they are so numerous that one could hardly speak of all.

With Dodoens' 'Herbal' as a base, and with additions from l'Obel, Clusius, and possibly some original work of his own, this volume comprised all that was known of botany at that period. It was much more profusely illustrated than any previous work, and coming, at a time when some good book was badly wanted, there is little wonder that it became world-famed, and though at the present day the interest that survives is due to the plates or the obsolete ideas as to virtues of various herbs, still we can but admire the patience of a man who, if he was not all original, did the best he could with the material at hand, however obtained, and produced a book which, after nearly 300 years, can still afford some instruction and a great deal of amusement to a more enlightened age. One of his friends, George Baker, "one of the chiefe chirugions in ordinarie" to Queen Elizabeth, had a high opinion of Gerard's attainments, since he says, "I protest upon my conscience, I do not think for the knowledge of plants he is inferior to any; for I did once see him tried with one of the best strangers that ever came to England, and was accounted in Paris the only man, being recommended to me by that famous man M. Ambroke Parens, and he being desirous to go abroad with some of our herbarists, for the which I was the mean to bring them together, and one whole day we spent therein, searching the most rarest samples. But when it came to the trial, my Frenchman did not know one to his fower." That statement can only apply to Jean Robi, who, in 1597, was appointed keeper to the king's garden in Paris. One can hardly leave this quaint old botanist and his wonderful book without some reference to the numerous anecdotes with which he constantly varies the monotony of his descriptions. Having frequently experimented with the mandrake root, he is quite incredulous as to its shrieking when pulled up, but firmly accepts a more wonderful tale of the goose or barnacle tree, and devotes his final chapter to "this wonder of England." He sums up his great work in this way. "Having travelled from the grasses growing in the bottom of the fenny waters, the woods and mountains, even unto Libanus itself, and also the sea, and bowels of the same, we are arrived at the end of our history, thinking it not impertinent to the conclusion of the same to end with one of the marvels of this land (we may say of the world)." What he is pleased to call "the naked and bare truth, though unpolished," vouches for the fact that in the north parts of Scotland and the islands adjacent, called Orchades, there are certain trees on which grow shells of a white colour, tending to russet, wherein are contained little living creatures, which shells in time of maturity open, and out of them grow those little living things which, falling into the water, do become fowls, which we call barnacles, in the north of England brant geese, and in Lancashire tree geese, but the other that do fall upon the land perish and come to nothing.

"Thus much by the writings of others, and also from the mouths of people of those parts, which may very well accord with truth." "But what our eyes have seen, and hands have touched, we shall declare." He then relates the story, which I give you nearly in his own language, that on an island in Lancashire where there are numerous wrecks of ships and drifted trees, there is found a certain spume or froth which breeds certain shells, like a mussel, but sharp pointed and white, wherein is contained a thing in form like a lace of silk, finely woven, as it were, together, of a whitish colour, one end whereof is fastened into the inside of the shell, even as the fish of oysters and mussels are. The other end is made fast into a rude mass or lump, which in time cometh to the shape and form of a bird When it is perfectly formed, the shell gapeth open, and gradually a bird appears, which, falling into the sea, gathereth feathers and groweth to a fowl, bigger than a mallard and lesser than a goose, having black legs and bill or beak, and with feathers black and white. He concludes his marvellous statement by saying it is "spotted in such manner as is our magpie, called in some places a pieannet, which the people of Lancashire call by no other name than a tree goose, which place aforesaid, and all those parts adjoining, do so much abound therewith that one of the best is bought for threepence. For the truth hereof if any doubt, may it please them to repair unto me, and I shall satisfy them by the testimony of good witnesses. They spawn, as it were, in March and April, the geese are formed in May and June, and come to fullness of feathers in the month after." Gerard himself brought from the Channel Islands to London shells which, on opening, he found in some instances contained living bodies without form or shape, in others which were more mature he found naked bodies shaped like a bird; these he concludes were "the fowls called barnacles." It is unnecessary to say that the six pairs of feet found in the third stage of the life-history of the barnacle are converted into cirri, which are long, curling arms fringed with cilia, and are used to attract food to the mouth. These were the feathery objects which Gerard describes. The confusion of the barnacle or bernicle goose with the shell-fish dates from a very early period. Even the monks believed in it, or found it convenient to do so, since the barnacle goose was allowed to be eaten in Lent. They considered it fish, not fowl; and Linnæus perpetuated the error by giving the crustacean the specific name, Anatifera, or duck-bearing.

I will now give you a short account of some of the herbaceous plants of general interest. First, *Hellebores.* Of these Gerard appears to have been acquainted with only four species, *viridis*, *fœtidus*, *major*, and *atrorubens.* Modern horticulture gives a great number which are readily cultivated in our gardens. This genus may be conveniently divided into three—two native species, *viridis* and *fœtidus*, both of which have been employed medicinally, being powerfully drastic and cathartic, the former deciduous, the latter a bushy plant two feet or more in height, with much divided evergreen leaves very distinctly bracteate. Next we have *Helleborus major*, with its several varieties, well-known as the Christmas rose, the plant from which the black hellebore of commerce is obtained, a native of Central Europe, long in common cultivation, a well deserved favourite with all lovers of hardy plants. Thirdly, the various species of the Lenten rose, or oriental hellebores. Conspicuous amongst the oriental section may especially be noted *atrorubrens*, having long and very persistent foliage, with bright purple flowers produced in profusion from January to March; *colchicus*, a rare species from the Caucasus, with deep plum-coloured flowers and large purple leaves; *H. antiquorum*, with pale purple flowers and sepals, beautifully imbricated; *H. guttatus*, a beautiful species with deep green leaves and much expanded white flowers with purple spots; *H. Olympicus*, having large spiny leaves and globular flowers; *orientalis*, white sepals, from which many interesting hybrids have been obtained. The hellebores seed freely, and their well-defined pistils, with the rapid growth of the ovary, quickly form inflated follicles; doubtless all the hellebores vary much in their medicinal activity. Schroff, according to Daniel Hanbury, considers the most potent to be *orientalis*, then follow *viridis* and *fœtidus*, whilst *niger* is of the least medicinal value.

From hellebores we naturally turn to *Aconites* or *Monkshoods*. Of these several species have been long in cultivation. Gerard was acquainted with most of those known to us at the present time. Perhaps no plant connected with pharmacy deserves more attention than *Aconitum napellus*, the officinal monkshood, especially when we take into consideration that between sixty and seventy varieties are known to botanists, varying from the dark blue of the typical plant to the *albino* variety, almost pure white. A question of great moment arises, that with a plant whose active principle exists in a well-defined alkaloid, how far hybridisation affects the amount of the *Aconitia* present. This plant is one which deserves most careful cultivation; whether the modern pharmacist would be willing to pay four times as much for a definite home grown root, taking into consideration that the foreign supply is mostly obtained from any species found by the peasants or shepherds who make it their business to dig it at any time rather than the right one, is the reason of my raising this question. *Aconitum Pyrenaicum*, with its bright yellow flowers and handsome foliage, *bicolor*, with white and yellow blossoms, are interesting species in the herbaceous garden. Before dismissing aconites, allow me to suggest that a strange error prevailed. Dioscorides tells us that whilst writing about *Aconitum pardalianches* (a plant, by the way, I am doubtful if it ever existed), "that it killeth panthers, wolves, and all kinds of wild beasts." Theophrastus says "that it killeth cattle, sheep, oxen, and all four-footed beasts within the compass of one day." After a time the old writers, not finding this plant, tacked on *pardalianches* to a *Doronicum* belonging to the natural order compositæ, in which there are no plants of a decided poisonous character. So that ill-omened name of "Leopard's bane" may safely be discarded. It is true that the *Pulicaria*, or flea bane, and the *Pyrethrum roseum*, destroy insects, but this is owing to the choking up of the spiracles or breathing orifices, so that the tracheæ can no longer convey the air through their system. Salmon, who wrote in his 'Herbal' (written about 100 years after Gerard), calls the *Doronicum* the wolf's bane *antidote*, and says, "I think it manifest that the dangerous qualities said to be in this plant are raised only from ignorance of fact and not from any real grounds, for as much as experience has sufficiently proved to the contrary, for I find myself it is an excellent cordial and cures the poison of aconitum and other poisonous plants." This supposed virtue is equally fallacious as that of its poisonous nature.

In the same natural order we have the *Podophyllum peltatum*, or May apple, a plant well worthy of attention, with its palmate leaves deeply divided, composed of from five to seven wedge-shaped sections bearing one or two large pure white flowers from the axil of the leaves, having a most delicate mixed perfume of cinnamon and clove. The blossoms expand the latter part of May or early in June, and are succeeded by a sub-acid, succulent, edible fruit. The plant is of rapid growth in favourable situations of shade and moisture. Although of recent introduction in European pharmacy, it appears to have been long known to the North American Indians as a valuable medicine. *Actaea spicata* and *Cimicifuga racemosa* must not be passed by without notice. They are both stately perennials, with deeply cut biternate leaves and white feathery flowers, and, as their respective names imply, one in spikes, the other in racemes. Actaea is a European plant, whilst Cimicifuga has for its native habitat the woods of Canada and the United States. Allied to Aconites, but much surpassing them in beauty, are Delphiniums. These, with little exception, are of modern introduction, *stavisagria* being the only one particularly noticed in old horticulture. At the present time the florists varieties give us many beautiful herbaceous specimens; many of them are double, blue and scarlet being the prevailing colours. Siberia and the Caucasus furnish us with numerous plants of this genus. *D. cardinale* is a plant of vigorous growth, which attains a height of four feet, has scarlet flowers, with a yellow centre. *D. sulphureum*, Zalil, is an extremely interesting plant from Turkestan; it forms a branching bush three to four feet in height, composed of stiff, wiry stems, which are covered with flowers about an inch in diameter, of the most beautiful sulphur colour, from forty to fifty blossoms on each stem, rendering it one of the most remarkable additions to our list of hardy perennials for many years past.

A few words on poppies. Most of these are annuals, excepting orientalis and bracteatum, the one orange-coloured, the other brilliant red, both with black spots in the base of each petal. Meconopsis furnish us with several strictly herbaceous plants, Cambrious giving us a good example, growing almost anywhere with its bright yellow blossoms—on old crumbling wall, a disused gravel path, or any dry corner suits it. We have two Indian species of Meconopsis: Nepalensis, a fine foliage plant with soft, yellow-green leaves, which have dense rosettes. These in the young state are folded over as a protection to the tender crowns. The flower-stems are from four to five feet in height, producing numerous nodding, yellow blossoms, a native of Nepaul. Besides this we have Walliche, one of the finest poppyworts in cultivation. This is remarkable from its being the only blue poppy known to us, growing from four to five feet in height, forming a handsome pyramid, the expanded blooms perfect in shape and colour, with its numerous yellow anthers, form a conspicuous object. The seeds of this plant were sent over by Sir William Hooker from Sikkim, and first bloomed in the Royal Gardens at Kew in June, 1852; unfortunately these plants are only biennuals. Sir Thomas Brown, a noted physician of the city of Norwich, about 1650, says, "that at times there springeth up of itself in waste ground a red poppy with very long fruit." Some years ago I had occasion to dig a piece of ground in my own garden rather deeply; the following spring I found abundance of this species of poppy, *Glaucium fulvum*; the seeds no doubt had laid dormant in the soil for many years. One other poppy before I pass on deserves special notice, this is the Californian or tree poppy, *Romneya Coulteri*. This is strictly herbaceous, requiring only a little protection to the crown in winter; it forms a strong bush six feet in height, with large, single white flowers, which are not fugaceous, as most of this order. Lastly, amongst the papaveraceæ, let us note *Sanguinaria canadensis*, or blood root. The rhizomes and rootlets are well-known in America as one of the eclectic remedies, a charming early spring flower, with its pure white petals and golden anthers. Of Anemones, Gerard figures thirty sorts, many of which are only varieties, as he in all cases places the single and double as distinct species. Since his day many additions have been made to our list of these most welcome spring flowers, especially may be noted *alpina* and *sulphurea*, both robust plants about two feet in height, one white and the other sulphur yellow flowers, followed by fruits consisting of large globular heads of feathered achines. I know of no plants so impatient of being disturbed when once they have been planted on the rock border. These two rarely survive moving, excepting in the young state.

*Apennina*, a bright blue species, with *blanda*, the Greek form of it. *Ranunculoides*, a wood loving species, and doubtful native of this country, of a bright yellow and deeply sected foliage. *Fulgens græci*, from the Morea, is a variety of the south of France *fulgens*, but much larger flowers and brighter colour. *Robinsoniana*, an American variety of our wood anemone, with large, pale, purplish-blue flowers, produced in great abundance from established plants. *Pulsatilla*, or pasque flower, of a deep rich purple, clothed with long silky hairs, the carpels terminating in a curious feathery tuft; found in several places in England, on chalk hills. *Pratensis*, an allied species from central France with its variety. *Nigracans*, the officinal plant of homœopathic tincture. *Palmata*, both yellow and white, from the Peninsula, the former with dark green palmate leaves, scarcely rising above the soil. *Vernalis*, a rock-loving species from the high Alps, with white flowers flushed with purple, and brown silky hairs on the calyx. *Japonica*, both red and white, introduced from Japan about fifty years ago, and now well known to all plant collectors, well suited for smoky town gardens; these form but a portion of this genus, all but the two last being spring flowering. Pliny tells us that "the name Anemone was given because the flowers never open except the wind doth blow." I now pass on to Felworts (as Gerard calls Gentians); these are all worthy of cultivation. I found in the Engadine, in addition to *lutea*, that *punctata* and *purpurea* were being collected for the sake of the roots; the two latter appeared more intensely bitter than *lutea*. The roots of Gentian contain no starch, sugar and pectin taking its place. In the Engadine and Tyrol they are heaped up in large clamps before they are submitted to fermentation and afterwards to distillation of an aromatic much-prised spirit. Considering the very slow increase of these plants it is not to be wondered that in many places they have become scarce. Indeed, in many parts of the Tyrol they have almost disappeared. We must also remember the many tons of the dried roots which are yearly exported for pharmaceutical purposes all over the world. In our garden flowers we must not forget *acaulis*, with its cushions of glossy foliage and intense blue upright bell-shaped blossoms; *Bavarica*, with small box-shaped leaves and brilliant sky blue flowers; *verna*, a rare indigenous species, but frequent on all the high Alps, with dense growth and bright blue white eyed blooms, with a number of others, all of which commend themselves to our notice. Of Rue Worts, Fraxinella or Dictamnus, a native of Germany, not the Dictamnus of old writers, which was an Origanum from Candia and Crete. Gerard says, speaking of Fraxinella, "that it is a very rare and gallant plant." This I can fully endorse, and consider it one of the best and oldest of our border plants. It is found both red and white, and instances are known where it has outlived three generations of a family without much increase of the plant. It is readily grown from seeds, which have the faculty of frequently lying dormant in the ground before germinating. When this plant is in flower, after a warm, dry day, by putting a lighted match to the inflorescence it becomes a sheet of flame; this is caused by the large amount of essential oil secreted in the flowers, hence the name given to it of "The Burning Bush."

Crocus and snowdrops; the former is of chief interest to florists for its several varieties of *vernus*, and also for many autumn and winter flowering species. We have several doubtlful natives of this genus, but I think we must consider they have been all introduced, though Gerard says, "The Saffron crocus grows plentifully in Cambridgeshire, Saffron Walden, and many other places thereabouts as corn in the fields." He must have meant, I think, that it was cultivated. *Crocus sativus* has a thick fleshy corm, hardly to be distinguished from that of *vernus*, except that the covering scales are more netted. Its primitive home is doubtful, having been in cultivation from very early times. It is mentioned by Homer, Hippocrates, and Virgil, and was introduced into this country in Edward the Third's reign, and for many years largely exported to the Continent. It was grown in Essex for about 200 years, and then slowly dropped out of cultivation; Spain has the monopoly of it now. I have flowered it in my own garden in dry, sandy soil, but have never been able to keep it more than one or two seasons. Under the name of *Leucojum precox minus*, Gerard has our snowdrops, which he calls the bulbous violet. He has also another variety, the Byzantine early bulbous violet; this is doubtless the one we have of recent introduction, and known as the Crimean snowdrop, which he so correctly figured in his 'Herbal.' The bulb and the two broad leaves, with the characteristic lines in the middle, give no doubt of the identity of the plant; besides, he says, "and Clusius calls it the greater early Constantinopolitan bulbous violet."

The Iris naturally claims our attention, not that the plants are of any particular medicinal value, but rather from the great variety of this genus, all, without exception, being beautiful and interesting plants. They are nearly all quite hardy, and most of them readily grown in town gardens. They are native all through the temperate zones. Robinsoniana, from Lord Howe's Island, is an exception, being half hardy. This plant seems to defy almost all attempts to bloom it in this country. At Kew it has flowered in the temperate house, but excepting this one instance I do not know of any other. The Orris of commerce is supposed to be obtained from *Iris Florentina*, an early variety with lovely white, sweet scented flowers, but *pallida* and the other varieties of the German Iris are dried in the same way for perfumery uses. Our earliest species, *histrio*, from the slopes of the Lebanon, commences to bloom in the open ground in February. It is soon succeeded by its close ally *reticulata*, with its delicate violet perfume, and several other rare species from the same source. Unfortunately these Asia Minor Irises have (although but recently introduced) become affected with a fungoid growth which has the appearance of a blue mould. It rapidly destroys the corm, leaving only a dry dust-like powder. All forms of bulbous Irises are subject to this form of disease. *Iris tectorum*, growing on thatched roofs of Japanese houses, requires, as may be supposed, a dry situation for its success; but the Iris of Japan is *kæmferi*, a splendid plant with numerous varieties, requires the margin of a pool or boggy ground. My friend, the late H. B. Brady, told me that he had seen a Jap artizan employing his midday resting time sitting under a large umbrella gazing at his patch of *kæmferi* in full bloom. *Siberica*, as its name implies, a Siberian species, with grass-like foliage and great variations of colour. *Susiana*, or "the widow Iris,' with its large black-netted bloom heads, is well worth the care and attention it requires. *Orientalis sanguinea* is one of the best garden species; the buds are red, hence the second half of its specific name. Under the name of Xiphium, or Spanish Iris, a bulbous species, which has been cultivated in this country for more than 300 years, we have a well-known favourite, with flowers varying from white to yellow and blue, one of the best species to grow in all private gardens. Allied to it we have *Iris Anglica Xiphion Latifolium*, of more robust habit than the former. This, also, has every variation of shade in the three colours. These few I have enumerated do not form a tithe of this most interesting family.

A few words on "Daffodils that come before the swallow dares and take the winds of March with beauty." They are favourites everywhere, and with everybody. Our old herbalist, Gerard, had a good knowledge of them, and several of the plates in the 'Herbal' are drawn with great care and fidelity, especially those of the reflexed or triandrus section. Since his time, and especially of late years, they have multiplied tenfold, both in species and varieties. Indeed, so varied are they that it is is difficult to determine the former or to trace the parentage of the latter. The southern part of Europe furnishes us with the chief of this genus, although *monophyllus*, and a few others little known, come from Northern Africa, near Oran. This white-hooped petticoat Narcissus (*monophyllus*) blooms at Christmas under glass. In the Pyrenees, the whole of Spain, Portugal, and Italy we find them abundant, both in low lying pastures and high upland slopes reaching to the snow, as in the Gerez and Estrella in Portugal. They are conveniently divided into three sections, the *Majus coronata*, which includes the Ajax, of which the native pseudo *Narcissus* of our English woods is a fitting type—this group also includes all the Corbularia, which are the hoop petticoat or Medusa's Trumpet; next we have the *medio coronata*, with chalice shaped crown or cup, half as long as the divisions of the perianth, this also includes all the Triandrus or Ganymedes; lastly, the *parvi coronata*, known as the small crowned Daffodil, or true Narcissus; these have the crown less than half as long as the divisions of the perianth; amongst these we also have the Jonquils, as also all the rush-leaved section and the Tazetta, or bunch flowered Narcissus. Unfortunately many of the best varieties, especially the white flowered, are subject to the daffodil disease, the result of a fungoid growth, and one which has baffled the attempts of the florist to eradicate; this disease has been but little studied, but its effects are most disastrous. It appears in the first season as a dark brown thumb-like mark on the sides of the bulb. The next year, in addition to that, we find the rootlets are but ill-formed, and in some entirely wanting. The third year the top of the bulb becomes spongy, producing no blossom, then the end has come. The only remedy I have found efficacious is to take up the roots every season, thoroughly drying them for a few week, this giving them complete rest. This seems a natural course when we remember that in their native habitats these bulbs become almost dust dry in the summer months. In the diseased bulbs I have tried with marked success dusting them with fresh lime. This acts in the same manner as sulphate of copper, arsenic or other germicides.

I had intended to carry this subject much further, but the field is so wide that I will not trespass upon your forbearance any longer, and I feel it is not reasonable to expect you all to take the same interest in this subject as myself. A love of plants is inborn, and the circumstances under which we are placed in life foster naturally such a taste. Still, we must all allow that even a very superficial knowledge of botany will much enhance the pleasures both of home and foreign travel.

Mr. **Fitzhugh** (Nottingham) proposed a hearty vote of thanks to the President for his address. He also took the opportunity, as Chairman of the Local Committee, to say how much they were indebted to the local chemists for their assistance in making arrangements for giving a good welcome to the Conference. He was quite sure that when printed the President's address would be read with much pleasure and profit.

Mr. J. **Laidlaw Ewing** seconded the motion, and also said he was charged by Mr. Young, of Edinboro', to express his deep regret at being unable to be present, and his hope that the meeting would be a great success.

The resolution was put by Mr. Fitzhugh, and carried unanimously.

The **President**, in responding, thanked the members for their attention, and for their appreciation of his modest effort. When he was apprenticed, his master, a friend, used to say to him:—"Depend upon it, Octavius, thy love of plants will never lead thee to any good," but the present meeting did not at all tend to verify that prophecy.

### Report of the Unofficial Formulary Committee.

To the British Pharmaceutical Conference in Session.

The revision of several of the old, and the introduction of some new, formulæ have had the attention of the Formulary Committee since my last report, and as some of them have required careful chemical investigations, which, as will be observed, have resulted in the production of papers for the Conference, the Committee has deferred the issue of a new formulary until these have undergone full discussion.

W. Martindale,
*Chairman of the Formulary Committee.*

(*To be continued.*)

## Provincial Transactions.

### FEDERATION OF LOCAL PHARMACEUTICAL ASSOCIATIONS.

A well attended meeting of the local secretaries of the Pharmaceutical Society and delegates of local associations attending the British Pharmaceutical Conference was held in the Committee Room of the Exchange Hall, Nottingham, at 9 a.m., on Wednesday, August 16.

Mr. W. Gowen Cross, Vice-President of the Pharmaceutical Society, having been voted to the chair, said it gave him great pleasure to be present at a meeting called to promote the greater unity of pharmacists.

An animated discussion took place, in which Messrs. H. Kemp, Manchester; C. Thompson, Birmingham; W. L. Currie, Glasgow; W. W. Savage, Brighton; David McLaren, Edinburgh; J. Bateson, Kendal; E. H. Butler, Leicester; E. F. Harrison, London; J. Hinton Lake, Exeter; R. D. Gibbs, G. E. Perry, and others took part.

The following propositions were unanimously agreed to:—"That a federation of local pharmaceutical associations be formed, its object being to promote the greater unity of pharmacists and the better protection of their trade interests," and "That a committee consisting of Messrs. Cross, Currie, Kemp, and Thompson (Mr. Thompson acting as Secretary *pro tem.*) be appointed to communicate with the secretaries of local associations with a view to the formation of an Executive."

## Proceedings of Societies in London.

### CHEMICAL SOCIETY.

### The Constituents of the Indian Dye Stuff Kamala.*

BY A. G. PERKIN, F.R.S.E.

In conjunction with my brother, W. H. Perkin, jun., I published (*Ber.*, xix., 3109) a short paper "On Kamala," with the intention of afterwards making a thorough investigation of this dye stuff, not knowing at the time that the subject had previously been investigated by Anderson (*Jahresbericht*, 1855, 669, and *Edin. New Phil. J.*, i., 300). Owing, however, to the difficulty of obtaining a sufficient quantity of raw material, due to the want of knowledge as to the best source from whence to procure it, the investigation had at the time to be abandoned, and was recommenced only lately.

For some of the samples of kamala which I ultimately obtained, I am indebted to the kindness of Mr. T. Wardle, of Leek, but larger quantities have been recently procured from Messrs. Wright, Layman, and Umney, of London.

A full account of the botanical nature of kamala is given in the *Encyclopædia Britannica*, and in the paper by Anderson on this subject (*loc. cit.*), and it will be sufficient to state here that it is used in India in dyeing silk a brilliant yellow colour, and also in medicine as a remedy for tænia, the dose being from 30 to 120 grains. According to Anderson, unadulterated kamalas contains approximately 3·49 per cent. of water, 78·19 per cent. of resinous colouring matter, 7·34 per cent. of albuminous matter, and 3·84 per cent. of ash.

The only samples of kamala that I was able to obtain were all highly adulterated with sand, and a reddish ferruginous earth, not visible to the naked eye, but readily discovered by elutriation with water. A mixture of three commercial samples, all adulterated, gave on ignition 52·5 per cent. of ash, and by extraction with ether 26·09 per cent. of resinous colouring matter. Two other samples gave respectively 56·4 per cent. and 46·4 per cent. of ash.

Anderson found that the ethereal extract of kamala yielded three substances, namely, a crystalline compound rottlerin, $C_{11}H_{10}O_3$, a wax, $C_{20}H_{34}O_4$, and a resin, melting below 100°, to which he gave the formula $C_{30}H_{30}O_7$. Leube (*Jahresbericht*, 1860, 562), however, was unable to obtain any crystalline product, but he describes a resin melting at 80°, having the formula $C_{15}H_{18}O_4$, and a resin melting at 191°, of the formula $C_8H_{12}O_5$. Oettingen (dissertation in the Russian language, St. Petersburg, 1862) also was unable to obtain any crystalline substance from kamala.

In our paper (A. and W. Perkin, *Ber.*, xix., 3109) we were, however, able to confirm Anderson's results in so far that we obtained a crystalline substance called by us "mallotoxin," and identical with the rottlerin of Anderson, a result subsequently confirmed by Jawein (*Ber.*, xx., 182).

*Summary of Results.*

When extracted with ether, kamala yields a dark, brownish, resinous product from which six distinct substances can be isolated. Five of these, namely, rottlerin, and a substance I have named isorottlerin, a wax, and two resins, one of high and the other of low melting point, form the principal constituents, but there is also present a trace of a yellow, crystalline colouring matter.

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* From the *Journal of the Chemical Society.*

In order to readily isolate these substances, it was found preferable to extract the kamala in the first place with carbon bisulphide, as this does not dissolve isorottlerin and one of the resins, thus facilitating the separation.

Kamala contains also a minute amount of an essential oil or similar substance, giving to it when gently warmed a peculiar odour, but from which it can be readily freed by treatment with steam.

*Rottlerin*, the principal constituent of kamala, and which is obtained on concentrating the carbon bisulphide solution, crystallises in thin, salmon-coloured plates melting at 191–191·5°. Even when repeatedly recrystallised it was never obtained yellow, as described by Anderson, and it is probable that Anderson's preparation was contaminated with a trace of a yellow, crystalline substance which is present along with rottlerin in the first extractions, and will be described later on.

When heated with caustic potash at 150° it yields benzoic acid, acetic acid, and an amorphous substance; and when oxidised by means of hydrogen peroxide in alkaline solution the same compounds are obtained. In this latter operation the formation of benzaldehyde can also be detected, and it seems probable that this is one of the earlier products of the oxidation.

On treatment with cold nitric acid (sp. gr. 1·5), rottlerin yields, besides oxalic acid, two new acids melting at 282° and 226°, and having respectively the formulæ $C_{17}H_{14}O_9$, and $C_{17}H_{16}O_9$. These are readily separated by recrystallisation from alcohol. Boiling nitric acid of sp. gr. 1·5 decomposes rottlerin, forming oxalic acid and a bibasic acid of the formula $C_{13}H_{10}O_9$, melting at 232°, and yielding a crystalline silver salt, $C_{13}H_8O_9Ag_2$. This acid is also obtained by the action of boiling nitric acid on the acids $C_{17}H_{14}O_9$ and $C_{17}H_{16}O_9$, mentioned above. These acids are not formed by the action of nitric acid of sp. gr. 1·42 alone, or diluted with water or glacial acetic acid; but oxalic acid, a resinous substance, and a small quantity of a crystalline product, apparently benzoic acid, were obtained.

When heated with acetic anhydride, rottlerin yields a diacetyl derivative of the formula

$$C_{11}H_8O_3(C_2H_3O)_2.$$

The molecular weight of rottlerin has not yet been satisfactorily determined, but from preliminary experiments made on the elevation of the boiling point of a chloroform solution in Beckmann's apparatus it is evidently very high, probably about 485. Further experiments on this point are in progress.

The *resin of low melting point* gave, on analysis, numbers nearly in accordance with those obtained by Anderson, and agreeing with the formula $C_{12}H_{12}O_3$, and it is probable that his slightly higher figures are due to the contamination of his product with traces of other substances, as indeed he suggests is the case in his paper. This resin of low melting point resembles rottlerin, with which it is evidently closely allied in most of its properties, and as its formula differs from that of rottlerin by $CH_2$, it was at first thought that it was a methyl ether of the latter, but this assumption was disposed of by a study of its behaviour with hydrogen iodide; in Zeisel's apparatus, no trace of methyl iodide being obtained. The acid of the formula $C_{13}H_{10}O_9$ above mentioned is obtained by treating the resin of low melting point with boiling nitric acid, but on using cold nitric acid no crystalline products could be isolated. When this resin is boiled with dilute alkalis, the characteristic odour of benzaldehyde is noticeable, and this is also the case when the cold alkaline solution is treated with hydrogen peroxide.

The *yellow crystalline colouring matter* obtained in the first extractions of kamala with carbon bisulphide is closely allied to rottlerin, but is present in such minute amount that sufficient could not be obtained for analysis. It forms a beautiful, glistening mass of yellow needles, and melts at 192–193°.

The *wax* present in kamala gave, on analysis, numbers which are widely different from those obtained by Anderson, and it is therefore possible that the nature of the wax may differ in samples of kamala procured from different localities. The results obtained with the wax extracted by me gave as a mean C = 79·70 per cent., H = 12·86 per cent., agreeing with the formula $C_{26}H_{54}O_2$. Anderson found carbon 71 per cent., hydrogen 11·05 per cent., agreeing with the formula $C_{30}H_{24}O_4$. This wax is a colourless, apparently crystalline mass melting at 82°, the melting point of cetylic cerotinate, with which it has many properties in common, and with which it may be identical in spite of a slight discrepancy between the analytical numbers found and those required by the formula of this substance. The residue left on extracting the kamala with carbon bisulphide contains two substances, isorottlerin and a resin of higher melting point, both of which are readily extracted by treating the residue with ether.

*Isorottlerin* crystallises in groups of minute plates melting at 198–199°, and in its appearance greatly resembles rottlerin, from which, however, it is readily distinguished by being practically insoluble in carbon bisulphide, chloroform, and benzene, whereas rottlerin is comparatively soluble in these liquids. Again, hot alkaline solutions of rottlerin deposit resinous matter on boiling, and an odour of benzaldehyde can be detected, whereas in the case of isorottlerin no resinous matter separates, and there is no odour of benzaldehyde. By boiling with nitric acid (sp. gr. 1·5), a crystalline acid was obtained from isorottlerin identical with the acid of the formula $C_{13}H_{10}O_9$, before mentioned as being obtained from rottlerin.

The *resin of high melting point* is a pale yellow amorphous substance of the formula $C_{12}H_{12}O_4$, closely allied to rottlerin in many of its properties, and which also yields the acid of the formula $C_{13}H_{10}O_9$ when boiled with nitric acid of sp. gr. 1·5.

Kamala contains, moreover, a small quantity of a *sugar*, which is extracted from it by water, but all attempts to obtain this in a state of purity have been so far unsuccessful.

## EXPERIMENTAL PART.

### *Extraction of Kamala with Carbon Bisulphide.*

In carrying out this operation, well-dried kamala is left in contact with six times its bulk of cold carbon bisulphide during about twenty-four hours, occasionally shaking; the dark red extract thus obtained is filtered, and the bulk of the carbon bisulphide distilled off. As the concentration proceeds, minute brownish specks separate, which, under the microscope, are seen to have a distinctly crystalline appearance, and which, as soon as the separation has ceased, are collected, washed with carbon bisulphide, and dried.

The product from this first extraction, which constitutes "crude rottlerin," contains a small quantity of a yellowish crystalline substance which is not present in the crude rottlerin obtained in subsequent extractions.

The filtrate from the crystals, after a time, deposits a gelatinous substance, which, on crystallisation from carbon bisulphide, yields a further quantity of crude rottlerin. This is again filtered off, the filtrate concentrated until it has the consistency of thin treacle, then strained through glass wool to remove the last traces of rottlerin, and evaporated nearly to dryness. The dark red, resinous product is next treated with excess of methyl alcohol, which precipitates a wax-like substance; this is collected, washed with a little methyl alcohol, drained on a porous plate, and in this condition constitutes the *crude wax*. The *resin of low melting point* is obtained by evaporating the filtrate to dryness.

The residue left after extraction with cold carbon bisulphide is digested during about an hour with a large quantity of boiling carbon bisulphide, and the dark red liquid filtered off. On standing, this becomes thick, owing to the separation of a large quantity of gelatinous matter; this was found to consist chiefly of crude rottlerin, and, during the subsequent concentration of the carbon bisulphide solution, gradually becomes crystalline, and is separated by filtration. It is from this extract that the largest quantity of "crude rottlerin" is obtained. The filtrate from these crystals contains wax, and the resin of low melting point, which may be isolated as before described.

The extraction of the residue with boiling carbon bisulphide is repeated several times, until the extract becomes nearly colourless. From these a gradually decreasing quantity of rottlerin is obtained by the methods given above.

### *Rottlerin.*

As already mentioned, the rottlerin obtained from the cold carbon bisulphide extract of kamala contains besides this substance a small quantity of a yellow compound. As the latter is less soluble in toluene than rottlerin, it is easily removed by recrystallisation from this solvent, and will be referred to later on. The crude rottlerin obtained from the hot carbon bisulphide extract is a pale salmon-coloured, friable mass, and is in a purer condition. It is readily purified by two or three crystallisations from chloroform, which removes a small quantity of a sparingly soluble substance, and lastly, crystallisation from toluene with the aid of a little animal charcoal.

Analysis gave the following results:—

0·1580 gave 0·4003 $CO_2$ and 0·0775 $H_2O$. C = 69·09; H = 5·45.

0·1267 gave 0·3230 $CO_2$ and 0·0620 $H_2O$. C = 69·52: H = 5·43.

$C_{11}H_{10}O_3$ requires C = 69·47; H = 5·26 per cent.

$C_{18}H_{16}O_5$ requires C = 69·23; H = 5·12 per cent.

Rottlerin is a pale, flesh-coloured, glistening mass consisting of slender, transparent plates, which are very soluble in cold ether, but only sparingly in carbon bisulphide or glacial acetic acid. It crystallises beautifully from acetic acid in groups of flat needles; but on continued boiling of the solution it undergoes change, what is probably an acetyl derivative being formed. Chloroform, toluene, and benzene are the best media to crystallise rottlerin from; solvents of higher boiling point could not be used, as they appeared to exert a slight decomposing action.

Rottlerin melts at 191–191·5°, forming a reddish-brown liquid, which on strongly heating becomes carbonised, a white vapour being evolved; this has a pungent acrid smell, and condenses to a thick, brown oil, which does not solidify even after long standing. On distillation with zinc-dust it yields a small quantity of an aromatic oil, and when heated with soda-lime an oil having the characteristic odour of dibenzyl is obtained. It is intended to further investigate these decompositions. A boiling alcoholic solution of rottlerin containing a trace of acid or alkali is readily decolorised by zinc-dust, and the colourless reduction product thus produced gives a dark, violet-green coloration with ferric chloride in alcoholic solution.

Cold concentrated sulphuric acid dissolves rottlerin, forming an orange-coloured solution, and from this, on adding water, a light-coloured, gelatinous precipitate is thrown down, consisting of a new product, which has not so far been obtained in a crystalline condition. If chromic anhydride be added to a glacial acetic acid solution of rottlerin, a greenish, amorphous precipitate is at once deposited, which is evidently the chromium compound of an oxidised product. Rottlerin is readily attacked by a cold solution of bromine in carbon bisulphide, hydrogen bromide being evolved. Solutions of the alkali carbonates and hydrates dissolve rottlerin, the former only on gently warming. On boiling the orange-coloured solutions so produced, decomposition gradually takes place, an odour of benzaldehyde being evolved, and a resinous product separating; this may be extracted from the alkaline mixture by means of ether. The extract, on evaporation, leaves a resinous mass, which resists all attempts to obtain it in a crystalline condition. An alcoholic solution of rottlerin is coloured brown on the addition of ferric chloride.

(*To be continued.*)

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACT.

### SALE OF POISON BY AN UNREGISTERED PERSON.

A summons taken out by the Pharmaceutical Society to recover penalties under section 15 of the Pharmacy Act, 1868, in respect of a sale of poison by an unregistered person, came before his Honour Judge Lushington at the Wandsworth County Court on Monday, the 14th inst. The defendant Hill, a chemist's assistant at Richmond, Surrey, did not appear, having paid the penalty into court.

Mr. Grey (barrister) appeared on behalf of the Society, and said that his clients had only received notice that morning that the defendant would not appear. The question of costs was dealt with by section 13 of the Pharmacy Act, 1852. The question involved in the case was one of general public importance, and on this ground he would ask for the costs under section B.

His Honour acceded to the application.

# Obituary.

Notice has been received of the death of the following:—

On the 25th of July, Charles Francis G. Clark, Chemist and Druggist, late of Dudley. (Aged 75).

On the 27th of July, George Arthur Cannell, Chemist and Druggist, Sittingbourne. (Aged 56).

On the 29th of July, James Caunce, Chemist and Druggist, Tunbridge Wells. (Aged 76).

On the 30th of July, Roger E. Davies, Chemist and Druggist, Corwen. (Aged 26).

On the 9th of August, Thomas Spencer, Pharmaceutical Chemist, Wokingham. (Aged 81). Mr. Spencer had been a member of the Society since 1853.

On the 11th of August, John Strawson, Chemist and Druggist, Liverpool. (Aged 63).

On the 12th of August, Frederick John Smith, Chemist and Druggist, late of East Dereham. (Aged 58).

## BOOKS, ETC., RECEIVED.

THE PHARMACEUTICAL REGISTER OF NEW ZEALAND for 1898. Wellington: Brown, Thomson and Co. From the Pharmacy Board.

NON-TOXIC REMEDIES. By Dr. F. VON HEYDEN *Nachfolger*. London: Pardon and Sons. Pp. 40. From the Author.

# LEAVES FROM A SANSCRIT PHARMACOPŒIA.

BY THOMAS STEPHENSON, F.C.S.,
*Pharmaceutical Chemist, Bombay.*

The methods of medical treatment adopted by the "medicine men" of uncivilised nations have always a peculiar interest to those of the medical and pharmaceutical professions. It is true that little, if any, material benefit can accrue to the members of these professions by such study, and no pharmacist can hope to make his fortune any more quickly because he is well acquainted with the methods of the aborigines of his own or any other country. But, as an intellectual pleasure, the inquiry into such matters will fully repay itself to anyone who has sufficient knowledge to appreciate it, and such knowledge is possessed in the best degree by physicians and pharmacists only. I feel that these few apologetic remarks are necessary in these practical times, as I do not wish to be assailed with the perpetual *cui bono* (?) complaint, which is always levelled at those who do not make money the direct or indirect object of their leisure-time researches.

Some time ago it was my good fortune to make the acquaintance of a high-caste Hindu gentleman in this city, whose family had for generations back practised as "hakims" or native doctors, and in whose possession were a number of very ancient Sanscrit manuscript works on medical subjects. One of these he was engaged translating into Guzerati, and, in return for certain favours received, he showed me his translation, some of the more interesting parts of which I was able, with his assistance and that of a dictionary, to further translate into English. The greatest difficulty that stood in the way was that his knowledge was not sufficient to bring the names of diseases or drugs any nearer than Guzerati. However, he was able to give me a full description of the symptoms of the diseases and furnish me with specimens of most of the drugs, with the result that in nearly every case I was able to find the English synonym.

The manuscript in question appears to be arranged in a very unsystematic manner. It is divided into a number of chapters. Starting with an article on "Fever Medicines," it goes on to treat of "Purgatives," "Female Diseases," "Pills," "Powders," "Ointments," "Aphrodisiacs," "Cough Medicines," "Oils," etc., each chapter containing a more or less lengthy list of recipes, some very sensible, others amusing in their absurdity. It would be impossible, even if desirable, to go through the whole list, so I have singled out a few of the more important groups, and from these will select the more interesting formulæ.

## 1. Oils.

The oils used in native practice are very many, the natives of India appearing to place great faith in such forms of medication. They are generally applied externally, but are often taken in doses of 1 or 2 drops on betel leaf (*Piper betle*) for various complaints. Although the processes for the preparation of these oils are, as a rule, varied and complicated, they end in most cases with distillation, and consequently a description of this process as carried out by the natives might with advantage be given here before proceeding to describe the oils themselves.

The process of distillation is a very primitive one indeed. A quantity of the bruised drug is mixed with a certain proportion of milk; this is left to macerate for four or five days, after which it is put into a vessel made of metal or glass. This vessel, which consists of two flask-shaped portions, the necks of which fit into one another, is now closed, and the lower or empty part buried in the ground, whilst the upper part, which contains the drug, remains exposed above the earth. A fire is now kindled round the upper part of the vessel, and the oil eventually collects in the lower part. This process, I am told, is still employed by hakims for distilling nearly all their oils, those of sandal-wood, nux vomica, jequirity, etc., being typical examples of the process.

### *Oil of Sandal-wood* (*Chandan*).

Half a maund (14 lb.) of sandal-wood is powdered and mixed with half a pound of milk; this is left to macerate for four days, after which it is distilled in the manner described above.

The oil is employed by natives for asthma, insanity, gonorrhœa, and five different forms of fever.

### *Oil of Nux Vomica. No.* 1.

Take of—

| | |
|---|---|
| Nux vomica | 4 parts. |
| Bachnag (aconite) | 4 parts. |

Break into small pieces and add 1 lb. milk daily for three days. Dry in the shade for three or four days and distil.

This is used as an aphrodisiac, being applied locally on a betel leaf.

### *Oil of Nux Vomica. No.* 2.

Take of—

| | |
|---|---|
| Nux vomica | 10 lb. |

Break up into small pieces and add 2 lb. milk daily for seven days. Dry in the shade for seven days, and distil as usual.

The dose of this is one to two drops, given with caution, and its uses are as follows:—

Internally, one drop on betel leaf is given as an aphrodisiac, also for indigestion, diarrhœa, dysentery, hæmorrhoids, puerperal fever, hemicrania, and epilepsy.

Externally it is applied for leucoderma, leprosy and leprous sores, ringworm (the round variety), piles, partial paralysis, and weakness of the sexual organs.

### *Oil of Buffalo's Horn.*

Take of—

| | |
|---|---|
| Buffalo's horn | 2 lb. |

Chop up and subject to dry distillation in the same manner as in the preparation of other oils.

Dose, one drop on betel leaf, given internally as a general tonic. It is also said to be a useful medicine in diabetes, as it has the power of lessening the amount of sugar in the urine.

### *Oil of Red Sandal-wood.*

Take of—

| | |
|---|---|
| Red Sandal-wood | ½ maund. |

Break into small pieces and add 1½ lb. cow's milk daily for four days, shaking it up every morning. Dry in the shade for four days, and distil.

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Given internally in doses of two drops on betel leaf for elephantiasis, orchitis, insanity, and gonorrhœa.

*Oil of Chanoti* (*Guz.*) ; *Gunja* (*Sans.*) ;
*Jequirity* (*Eng.*).

Take of—

| | |
|---|---|
| Red Chanoti (Jequirity) | 2 parts. |
| Laving (Cloves) | 1 " |
| Jaiphur (Nutmeg) | 5 " |
| Javantri (Mace) | 1 " |
| Nag Kesar (Cassia pods) | 1 " |
| Ajwain-Khorassan (Omum seeds) | 5 " |
| Dhatura Seeds | 5 " |

Steep the jequirity in milk for four days and dry in the shade, then add the other ingredients and distil as usual.

Dose.—Two drops, as a nerve tonic.

*Oil of Sulphur.*

Take of—

| | |
|---|---|
| Purified Sulphur | 6 parts. |
| Juice of Calves' dung, a sufficiency. | |

Rub the sulphur in a mortar with sufficient juice to wet it, daily for three days ; then distil. It is used externally for leucoderma, while we have the author's assurance that this marvellous "oil" will, if taken internally in doses of one drop on betel leaf, cure *every* disease known !

*Oil of Loban* (*Olibanum*).

Take of—

| | |
|---|---|
| Loban (Olibanum) | 5 parts. |
| Oil of Malka-gani (Celastrus) | 10 " |

Break up the olibanum and macerate with the oil in a well-closed vessel for fifteen days. Applied for articular rheumatism.

*Oil of Hen's Eggs.*

Take six or seven eggs and boil soft; remove from the water, take off the shells, and put the yolks and whites together in a copper pot on a fire. As soon as a smell of burning is perceived, open the cover of the pot, add 1 or 2 grains of opium, and shut again. Then remove from the fire and set aside on the ground for four or five minutes, when the oil will separate.

Oil of hen's eggs is used as a strengthening application, also as an aphrodisiac, like oil of nux vomica.

### 2. PILLS.

This form of medicament is, as with us, one of the principal forms used by these hakims. Their pills, however, are very unscientifically made, being small, irregular in size and shape, and very unequally mixed. The hakim's knowledge of pharmacy does not appear to be so advanced as his knowledge of the healing art. The following are a few of the principal pills :—

*Aqui-tund-wati Gutika.*—"Warming" Pills.

Take of—

| | |
|---|---|
| Quicksilver | 1 part. |
| Sulphur | 1 " |
| Aconite | 1 " |
| Parsley seed | 1 " |
| Myrabolams (three varieties, *Hirda*, *Bira*, and *Amra*), of each | 1 " |
| Soda | 1 " |
| Javkhar (potas. carb.) | 1 " |
| Chitro (plumbago) root | 1 " |
| Sindan (white salt) | 1 " |
| Black salt | 1 part. |
| Sea salt | 1 " |
| Ginger (dried) | 1 " |
| Long pepper | 1 " |
| Nux vomica | ½ " |
| Cummin seed | 1 " |

Powder, mix, mass with lemon juice, and divide into pills of about 2 grains each. Such pills are given as a remedy for fever, jaundice, indigestion, and loss of appetite.

*Ashwa-chori Gutika.*—"Horse-power" Pills.

Contain quicksilver, sulphur, aconite, dried ginger, long pepper, myrabolams (three kinds), *Tankalkhar* (borax), *Nipala* (croton), and *Harya* (orpiment).

Make into a powder, grinding along with the juice of *Jalbhangra* for thirty-six hours, and divide into pills the size of *chanoti* (jequirity) seeds.

These pills are said to cure the following diseases :—Dropsy, epilepsy, eighteen varieties of fever, dysentery, cough, asthma, children's cough, pleurisy, jaundice, cramp, stoppage of urine, ague, rheumatism, indigestion, worms, piles, leucorrhœa, gonorrhœa, gleet, and diabetes. Rubbed up with sweet oil and applied, they are recommended for hemicrania, while rubbed up with juice of *chitro* root and taken internally they are looked upon as a specific for consumption.

*Atisar Gutika.*—Diarrhœa and Dysentery Pills.

Composed of—

| | |
|---|---|
| Opium | ½ part. |
| Catechu | 1 " |
| Gapan (sulphate of lime) | 1 " |
| Hing juice (asafœtida) | ¼ " |

Made into 2-grain pills. Dose, two pills twice a day. This formula is one of the few grains of wheat among the chaff.

*Ichabedi Gutika.*—Purgative Pills.

These are composed of—

| | |
|---|---|
| Mercury (metal) | 1 part. |
| Sulphur | 1 " |
| Borax | 1 " |
| Croton | ½ " |
| Ginger | 1 " |
| Harda (myrabolams) | 1 " |

Mixed and made into small pills of about 2 grains each.

*Madan-Ka-ameshwar Gutika.*—"Passion-controlling," or Aphrodisiac Pills.

These contain—

| | |
|---|---|
| Camphor | 1 part. |
| Ginger | 1 " |
| Red oxide of mercury | 1 " |
| Musk | ½ " |
| Opium | ½ " |
| Mace | 1 " |
| Nutmeg | 1 " |
| Pellitory (akalkaro) | 1 " |
| Cloves | 1 " |
| Talc (abrak) | 1 " |

Made into pills of 3 grains each, one for a dose.

*Vijai Gutika.*—"Success" Pills.

Contain—

| | |
|---|---|
| Chini-Ka-bulla (China cubebs) | 1 part. |
| Akalkaro (pellitory) | 1 " |
| Kavcha (cowhage) | 1 " |
| Mal-Ka-gani (celastrus seeds) | 1 " |
| Laving (cloves) | 1 " |

| | |
|---|---|
| Jaiphur (nutmeg) | 1 part. |
| Kesar (safflower) | ¼ „ |
| Khora-sa-min-ajmo (Niger seed) | 1 „ |
| Hinglo (cinnabar) | ⅛ „ |
| Mastaki (mastic) | 1 „ |
| Chota Gokhru (tribulus terrestris) | 1 „ |

Made into small pills of 2 or 3 grains. Dose, one twice a day with milk, for spermatorrhœa.

### 3. Powders.

This class of medicines is divided into two sub-classes, viz., *Churān*, which contain only vegetable drugs, and *Ras*, which contain chemicals only, or at least as the principal ingredients. A few examples of the latter must suffice.

*Powder for Cough.*

Contains—

| | |
|---|---|
| Sanchlkhar (black salt) | 1 part. |
| Sindankhar (table salt) | 1 „ |
| Dhatura seed | ¼ „ |

Calcine together in an earthen pot. Dose, about 4 grains with butter.

*Gaji-Keseri-Ras.*—"Elephant and Lion" Powder.

This is a cure for paralysis and allied complaints, for which it is given in doses of about 2 grains with sugar. It consists of mercury, sulphur, garlic (*Lasan*), lime (*Chunam*), ammonia, alum (*Fatki*), long pepper (*Pipar*), borax (*Tankalkhar*), barilla (*Sagikhar*), common salt (*Lohnkhar*), arsenious acid (*Somul*), five varieties of rock salt in equal quantities, ginger, pepper, *Silagit*, plumbago root (*Chitrak*), aconite (*Bachnag*), cinnabar (*Hinglo*), orpiment (*Harthal*), and realgar (*Mansir*).

### 4. Ointments (*Malam*).

One example of these will suffice, as they present no peculiarity.

*Ointment for Wounds and Boils.*

Contains—

| | |
|---|---|
| Mercury | 4 parts. |
| Bhudaism (litharge) | 4 „ |
| Murthu-thu (cupri sulph.) | 4 „ |
| Catechu | 5 „ |
| Resin | 10 „ |
| Wax | 10 „ |
| Chikani-supari (a kind of betel) | 5 „ |
| Red lead | 4 „ |
| Sweet oil | 10 „ |

Mix the oil with the wax and resin, and rub up with the powders, previously mixed with the mercury.

### 5. Various Cures.

*Scorpion Bites.*—Take of—Pure sulphur, tamarind fruit, nutmeg, and opium, equal parts. Make into a paste with water and apply, keeping it warm by holding the part over a fire. This preparation is said to effect an absolute cure in ten minutes.

*Snake Bites.*—Three internal remedies for this are mentioned in the work in question:—

*Prean-Mool* (root of ?) rubbed up in rice water may be given every half hour; or the juice of *Gallo* (*Tinospora cordifolia ?*) given at similar intervals; or, again, half hourly doses of *Indra varani* (colocynth) root rubbed up in whey are said to effect a cure.

*Rat Bites.*—A mixture of *Bhudaism* (litharge), *Dirwenchi* (rhubarb), and *Dharam* (pomegranate rind) is to be rubbed with water and applied on cotton.

*Swelling of the Neck.*—This is a complaint from which many natives suffer, and no fewer than five rather curious remedies are given in this book. They are as follows:—

1. *Sarpankha* root mixed with cow's urine, to be applied by rubbing.

2. Black serpent's bones strung together and worn round the neck as a necklace. My Hindu friend informed me in perfect good faith that this was really a marvellous remedy, his father having cured many patients by no other treatment than this. Such a statement sounds amusing to our ears, but after all may not our modern teething necklaces and electric belts be only a development of this ancient method of treatment? Necklaces of serpent's bones are very costly; my friend told me that that in his father's possession had cost about eighty rupees.

3. Mango seeds and horse's hoof parings are to be burnt together in a pot, mixed with butter, and applied.

4. Camel's bones and buffalo's horns in powder are to be mixed with sweet oil (in which the flowers of *Canna indica* have previously been boiled), and applied to the affected part. This, next to the serpent's-bone necklace, is the favourite treatment for the complaint.

5. *Akra* flowers (*Hibiscus esculentus*) are to be heated in a closed pot and applied with *ghee* (clarified butter) to the affected part.

The book under review contains many more items both interesting and amusing, but space forbids more being detailed at present. Many of the remedies mentioned appear absurd to our eyes, but it must be remembered that these remedies are all prepared and administered by the hakim himself, and in many cases simply act as a mask or blind while the patient is being subjected to rigorous hygienic treatment, otherwise it would be difficult to account for the many wonderful and authentic cures wrought by the native medicine men of this and similar countries.

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## DETERMINATION OF DIASTASE IN THE LEAVES AND STEMS OF PLANTS.

While the majority of physiologists believe that the conversion of starch into sugar is always the result of the action of a diastatic ferment, Professor Wortmann has maintained the contrary. M. St. Jentys now attempts to explain the failure of Wortmann to find diastase in the aqueous extract of leaves and stems on the following grounds. It is probable, he considers, that the diastase is formed only in small quantities, as it is required for the conversion of starch into sugar. The presence of tannin in the aqueous extract causes the precipitation of the starch, which is then acted on only with great difficulty by diastase, and the tannin also precipitates the diastase itself. Finally, diastase possesses only a very feeble power of diffusion, and therefore, when contained within cells, only passes into the solution after the complete destruction of the cell-walls, and in company with the tannins, which then precipitate it (*Verhandl. Akad. Wiss. Krakau*, 1893, 47 pp.).

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## NATURE OF THE STAINING PROCESS OF VEGETABLE TISSUES.

It has long been a matter of controversy whether the colouring of cellulose fibres by staining reagents is dependent on a chemical process or merely on a mechanical union of the particles of the pigment with those of the cellulose. Herr G. Spohn has attempted to set this question at rest by a careful microscopical examination of cotton-wool stained by mineral pigments. He found no change whatever in the structure of the fibre itself. Even when the fibres were macerated before staining with alizarin, they acted simply as a carrier of the pigment, on which the macerating fluid acts chemically. In all cases, according to these observations, the combination of the pigment with the fibre depends entirely on purely mechanical causes (Dingler's *Polytechn. Journ.*, 1893, Heft 9).

### REGULATION OF THE SALE OF POISONS.*

Since the last annual meeting of the British Medical Association considerable progress has been made towards securing more adequate administration of the Pharmacy Act in regard to the sale of poisons. The magisterial decision given in the prosecution instituted by the Treasury last year had the effect of establishing the important principle that the erroneous application of the term "patent medicine" to secret remedies does not obviate the necessity of complying with the requirements of the statute law, and of duly labelling all such preparations containing poisons within the meaning of the Pharmacy Act. It is satisfactory that this decision was not disputed, and that to a large extent it was accepted as final by the proprietors of secret remedies, so far as the point of labelling is concerned. The Pharmaceutical Society being, under the 15th section of the Pharmacy Act, exclusively empowered to enforce the provisions in regard to the sale of poisons by unqualified persons, it remained for that body to follow up the action taken by the Public Prosecutor under the 17th section of the Act. At the instigation of the Parliamentary Bills Committee of the Association steps were taken with that object. The result of a case heard before his Honour Judge Bacon, in the Bloomsbury County Court, was a decision that proprietary medicines containing poison cannot be lawfully sold by persons who are not legally qualified to sell poisons. The subsequent confirmation of Judge Bacon's interpretation of the Act, on appeal to a divisional court, has entirely dispelled the illusion that preparations containing poison are exempt from the provisions of the Pharmacy Act when they are sold under conditions rendering them liable to medicine stamp duty. On the contrary, they must not only be labelled as the Act directs, but they can only be sold by properly qualified persons. Thus a construction of the Pharmacy Act has been arrived at which is rationally consistent with its original object. It has been distinctly laid down by judicial authorities that the Act prohibits unqualified persons from selling poison—however it may be concealed or disguised by the admixture of other substances—and that in all cases suitable precautions are to be observed even by persons legally qualified to sell poisons. The object which the Committee had in view has therefore been fully attained as a matter of principle, and the practical application of that principle should do away with all ground for further apprehension of danger arising from indiscriminate and unguarded sale of poisons.

The only question remaining relates to the mode of enforcing the law. It is not yet quite clear whether that should be the duty of the authorities representing the general public, or whether it should be left altogether to the Pharmaceutical Society. The further action of the Public Prosecutor in that respect has been limited by the directions given to the officers of the Treasury by the Attorney-General—first, to prosecute only in the event of a particular preparation being really poisonous or dangerous on the ground of poisonous ingredients, and, secondly, that the mere presence of a poisonous ingredient, if not in sufficient quantity to make the article sold poisonous, would not be sufficient to justify proceedings under the 17th section of the Act. The points here referred to involve various considerations as to quantity and proportion as well as the effects of poisons upon adults and children respectively, which are not of a nature to be easily dealt with. They are, in fact, outside the scope of the Pharmacy Act, by which certain articles are declared to be statutory poisons, and the sale of them is absolutely restricted to persons possessing a specified qualification. The question whether a preparation is "really poisonous or dangerous" is altogether one of quantity, and a quantity that would be harmless to one individual might be fatal to another. There is therefore still some danger of the Pharmacy Act being "frittered away" (to use the words of Sir Henry Hawkins). While on the one hand the action of the Public Prosecutor, under the 17th section of the Act, is hindered by uncertainty as to what is to be considered a poison, the Pharmaceutical Society, on the other hand, appears to limit its action to proceedings under the 15th section of the Act, for preventing the sale of poisons by unqualified persons, and to prosecuting offenders in that respect. The monthly reports of the Pharmaceutical Society show that a very large number of such prosecutions have been instituted, and the recovery of penalties for that breach of the law will no doubt, in time, produce a wholesome deterrent effect. But there is good reason for believing that the supply of preparations containing poisons within the meaning of the Pharmacy Act and not labelled "poison" is still being carried on, by direct sales and in other ways, to a large extent with great danger to the public. From the reticence of the Public Prosecutor on the one hand, and of the Pharmaceutical Society on the other, such evasion of the law escapes the repression which is desirable, and it is still a matter of importance to consider how this evil is to be practically dealt with in the public interest.

Another circumstance connected with the sale of preparations containing poison, to which attention has recently been directed in the *British Medical Journal*, is the attempt to secure immunity from the provisions of the Act by obtaining patents for such preparations, and trusting to the exemption of patent medicines contained in the 16th section. Several patents have already been obtained for preparations containing scheduled poisons, and, if this practice be allowed, it would seem probable that those preparations could be sold by unqualified persons and without any of the precautions of labelling, etc., which the law requires. Obviously this proceeding is utterly inconsistent with the objects of the Patent Law and of the Pharmacy Act. It is also fraught with serious danger to the public, and will on that account call for continued vigilant attention from the Committee.

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* From the report of the Parliamentary Bills Committee of the British Medical Association.

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, AUGUST 26, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## UNLAWFUL SALE OF POISON.

In the House of Commons last Monday, a question was put to the Secretary of the Treasury department by Mr. F. C. Frye in reference to the sale of medicines containing poisonous ingredients and the action of the Pharmaceutical Society under the Pharmacy Acts (see page 180). The inquiry made by Mr. Frye appears to have been suggested by statements made in a recent report of the Parliamentary Bills Committee of the British Medical Association, which is of interest at the present moment, and will be found at page 164. It is there stated that in regard to the prosecution of offenders under the 17th section of the Pharmacy Act, 1868, "the further action of the Public Prosecutor, in that respect, has been limited by directions given to the officers of the Treasury by the late Attorney-General." It is further stated in the report that according to those directions prosecutions were to be instituted "only in the event of a particular preparation being really poisonous or dangerous on the ground of poisonous ingredients," and, secondly, "that the mere presence of a poisonous ingredient, if not in sufficient quantity to make the article sold poisonous, would not be sufficient to justify proceedings under the 17th section of the Act." The authority upon which these statements were made is not mentioned in the report; but the fact that Mr. Ernest Hart has been in correspondence with the officials of the Treasury on behalf of the Parliamentary Bills Committee, would probably admit of the inference that the statements in question represent the outcome of that correspondence. On that point, however, conjecture is unnecessary now that the directions given by the late Attorney-General to the department of the Solicitor to the Treasury have been confirmed by Sir J. Hibbert, in his reply to Mr. Frye's question. The fact that those directions are still being acted upon by the Director of Public Prosecutions may throw some light on the remark that there is some uncertainty as to the mode in which the law relating to the sale of poisons is to be enforced, and that is the only question which now remains to be decided. But it must be remembered that the directions given by the late Attorney-General were anterior to the decision of the appeal in the Piper case, and while the question as to the construction of the Pharmacy Act, 1868, was still *sub judice*. The judicial interpretation of the Act is now an accomplished fact. It is so regarded in the report of the Committee, and though it is thought to be not yet quite clear whether the authorities representing the general public are to take part in the administration of the Act, or whether that duty is to be left altogether to the Pharmaceutical Society to carry out, the provisions of the Act really admit of no doubt on that point.

Mr. Frye appears to have formed a very different opinion as to the purport and significance of the statements in the report above referred to. Accepting them, perhaps too readily, as evidence of a restriction imposed upon the action of the Treasury department by a former law officer of the Crown, he evidently anticipated that the action of the Pharmaceutical Society in prosecuting offenders under the Pharmacy Act was to be subjected to a similar restriction. That view can be understood when it is remembered that, as the Chairman of the Metropolitan Grocers' and Provision Dealers' Association, he represents the defeated appellants in the Piper case. No doubt his wish was father to the thought; but the reply of the Secretary to the Treasury on Monday is calculated to dispel the illusion. While admitting the substantially correct quotation of the directions which have been, and still are being, acted upon by the Director of Public Prosecutions, Sir J. Hibbert distinctly recognised the fact that the power of enforcing the law rests mainly with the Pharmaceutical Society in virtue of the powers conferred upon it by the first, second and fifteenth sections of the Pharmacy Act, 1868. The justification of the Society in demanding penalties from tradesmen throughout the kingdom for the sale of articles which Mr. Frye described by the misleading designation of "patent medicines" is furnished by the provisions of the Pharmacy Act, intended to protect the public against the dangers of poison, and by the judicial construction they have recently received. Moreover, it is in the fulfilment of a public duty that its powers under the Act are exercised. Under those circumstances the fear that the Pharmacy Act may be "frittered away" has but slender foundation, and if it be the case that the supply of preparations, containing poison, is still being carried on, unlawfully, to a large extent, there is every reason to expect that a proper regulation of the trade in these articles will be effected before long.

The directions by which proceedings on the par of the Treasury have been limited admit of a very different interpretation from that put upon them either by Mr. Frye or by the Parliamentary Bills Committee of the British Medical Association. We do not regard them as being indicative of doubt as to the practical importance of the Pharmacy Act, or of any desire to restrict its application, but rather as the result of a strictly logical consideration of the Act, of the one great object contemplated by it, and of the means by which that object is to be attained. The terms in which the directions of the Attorney-General are expressed are almost identical with those employed by the medical officer of the Privy Council in replying to a question put by the Pharmaceutical Society, shortly after the passing of the Act, as to pharmaceutical compounds containing "some scheduled 'poison' in extremely small and practically non-poisonous quantity." The question then was whether such preparations required to be labelled "poison," and, from the general nature of the Pharmacy Act, that question obviously had reference only to the sale of poison in accordance with the main provision of the Act. In like manner the directions of the Attorney-General in regard to prosecutions under the Pharmacy Act apply—not to the unlawful sale of poison—but exclusively to the labelling and the other precautions which are to be observed in the sale of poison by duly qualified persons. So far as the main object of the Act is concerned, those directions have in fact little or no application at all, inasmuch as the Treasury department has no power in regard to it. The provision made by the seventeenth section of the Act for punishing neglect of the precautions therein specified in regard to retail sales, applies exclusively to registered persons, and is entirely subsidiary to the more important provision of the first section, by which the retail sale of poisons is absolutely confined to persons who have a legal qualification under the Act. The mischief produced by indiscriminate sales of poison does not arise so much from neglect to use the "poison" label, as from the more or less unconscious familiarity with poisons, which is a consequence of their sale and use by persons ignorant of the attendant danger. Even the "poison" label ceases to be any safeguard under such conditions of association with packets of tea and sugar or other like commodities. In fact it is only within the ranks of duly qualified persons that the use of the "poison" label can be of any practical value, just as it is only within those limits that any question can arise as to the necessity for using it in particular instances. It is to such a view of the subject, on the part of the late Attorney-General, that we are inclined to attribute the directions he has given, and the consequent reticence of the Public Prosecutor may well be due to a perception of the fact that in cases of unlawful sale of poison—which is the major breach of the Pharmacy Act affecting public safety—the power of prosecuting offenders being entirely vested in the hands of the Pharmaceutical Society, it is the special business of that body to enforce its provisions.

## CANADA AND THE PHARMACOPŒIA.

According to the report of the annual meeting of the Pharmaceutical Association of Quebec, the President, in his address, referred to the position of the British Pharmacopœia in Canada and its failure to cover Canadian requirements in its present form. Thus, he pointed out that no one in Canada would think of supplying the British tincture of arnica, made from the rhizome and rootlets and possessing no fragrance, since the public there expects to receive the U.S.P. tincture of arnica flowers. Again, B.P. tincture of rhubarb cannot contend in price with the U.S.P. preparation, which contains no saffron but is quite as efficient and is preferred locally. It was suggested that, though custom has sanctioned the elevation of the British Pharmacopœia into a standard for Canadian pharmacists, there is really no law on the point.

In the discussion which followed the view was taken that, although the British Pharmacopœia was not entirely suited to Canada, it would be wiser to follow it until a Canadian Pharmacopœia could be prepared, and it was finally decided that the various provincial pharmaceutical associations of the Dominion should endeavour to act together, and approach the Federal Government with a view to defining the position of Canadian pharmacists as regards the pharmacopœia they must use as a standard. Following on the discussion, a Montreal firm has issued a circular in which it is maintained that custom obliges conformity to the B.P. in all cases unless there be special indication to the contrary, and it is further stated that this work occupies the first place as a standard in all the medical and pharmaceutical colleges of the various provinces of Canada. The *Canadian Pharmaceutical Journal* also shows that, in amendments to the Canadian Act dealing with the adulteration of food and drugs, it is expressly defined that every drug, including all medicines for internal or external use for man or for cattle, shall be deemed to be adulterated if, when sold under a name recognised by the British or United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein.

It may be pointed out that Professor Attfield, in his latest report to the Pharmacopœia Committee of the British Medical Council, drew special attention to the extent to which the British Pharmacopœia had become what it was originally intended to be, the "one uniform standard and guide whereby the nature and composition of substances to be used in medicine may be ascertained and determined" by members of the medical profession and those engaged in the preparation of medicines throughout the British empire. This fact seems to indicate that Canadian necessities and interests are not likely to be neglected by the General Medical Council, and it is extremely probable that steps will be taken at an early date to remove the inconveniences complained of in the Dominion. Though there may be no legal obligation to conform to the requirements of the B.P. in colonial practice, it seems in every way desirable that, as far as possible, uniform medicinal standards should be maintained in English-speaking countries, and we would venture the hope that the British medical authorities may shortly see their way to extend the Pharmacopœia, so that, in its scope, it may become a truly national one.

## SPURIOUS MEDICINAL PREPARATIONS.

The West Riding County Council is doing good service by actively prosecuting offenders against the Food and Drugs Act. The *Barnsley Chronicle* of 19th inst. reports a case in which an unqualified shopkeeper at South Heindley was charged with selling paregoric which contained only a minute quantity of opium. The usual defence that the paregoric was sold exactly as it was bought from a grocer at Barnsley failed to satisfy the magistrates, and a penalty of five shillings with costs was inflicted. In another case the article sold was quite destitute of opium, and a similar fine was imposed. The sale of articles nominally professing to be preparations of opium, but destitute of the essential ingredient, is now being carried out with great effrontery. A wholesale firm in Leeds issues a circular headed "Beware of Poisonous Medicines," in which, after referring to the opinions of coroners and the medical profession condemning the indiscriminate sale of poisons, as well as the numerous deaths from accidental poisoning, the merits of "chlorodyne" free from any scheduled poison are extolled as being far greater than those of the preparation whose name is appropriated improperly. This is a trick which is calculated to deceive the ignorant and unwary, and the only means of punishing the deception is through the aid of the Food and Drugs Act.

## TRADE MARK LITIGATION.

A case of some importance to chemists and druggists was decided in the High Court of Justice recently. It arose in consequence of the objection of the municipality of Carlsbad to the registration as a trade mark of the words "Kutnow's Improved Effervescent Carlsbad Powder." The municipality owns several mineral springs in the neighbourhood of the town of Carlsbad, from the waters of which salts are prepared by evaporation for purposes of sale. Though it was admitted that the applicant for the trade mark used these natural salts as the basis of his preparation, in which he claims to incorporate constituents of the Carlsbad water that are dissipated during the process of evaporation, it was urged that his use of the name Carlsbad was calculated to produce a false impression, confusing his preparation with the crude Carlsbad salts. Mr. Justice North, however, decided on all points against the municipality, with costs, expressing the opinion that Mr. Kutnow's conduct was perfectly honest, since by the use of the words "improved" and "effervescent" he described his powder strictly in accordance with facts. This decision would seem to indicate that a manufactured product may be modified and sold by others than the original manufacturers, and yet be associated with the name of the original preparation, if the facts be fully stated in the descriptive title, and are capable of legal proof.

## COMMISSION OF THE PEACE.

Torquay is now constituted a borough, and the names of the first justices of the peace appointed by the Lord Chancellor have just been announced. Among them we notice that of Mr. John Taylor, of Lucius Street, Torquay. Mr. Taylor is an associate of the Pharmaceutical Society, and a member of the Galen Lodge of Freemasons.

## BRITISH ASSOCIATION AT NOTTINGHAM.

In connection with the forthcoming meeting at Nottingham, it is announced by Professor Clowes that part of the work of the different sections will consist in receiving reports made by the various research committees on a large number of interesting subjects. Other topics of general interest will also be introduced and discussed—section A dealing with physical problems, section B receiving communications on explosions in coal mines, flame, bacteriology, recent progress in inorganic chemistry, and recent research in organic chemistry. In section C there will be a presidential address on "The Doctrine of Uniformitarianism as Illustrated by Recent Petrographical Research," and sections C and D will jointly discuss "Fossil and Recent Coral Reefs." The chemical process of respiration and other questions of fundamental importance in biology will be discussed in section D, geographical papers will be read in section E, whilst at a joint meeting of sections C and E the mutual relations of geology and geography will be considered. Political economy will receive attention in section F, engineering in section G, and in section H the subject of the presidential address will be one special phase of man's development. Professor Smithells is to give a popular lecture, in which he will describe and illustrate his recent researches on "Flame;" Professor Victor Horsley will similarly treat of "The Discovery of the Physiology of the Nervous System;" and Professor Vivian Lewis will lecture to working men on "Spontaneous Ignition."

## LONDON COUNTY COUNCIL SCIENCE CLASSES.

The Technical Instruction Board of this Council has issued a series of regulations with regard to the administration of grants to science classes, the intention being to make the instruction efficient and develop technical education properly. An indispensable condition of aid being granted by the Board in chemistry, physics, mechanics, and botany, is that provision must be made for experimental work by the students themselves, in addition to the experimental illustration of lectures or class teaching, every lecture being followed by at least one hour's practical work.

## THE EPIDEMIC AT WORTHING.

In order to relieve the suffering caused by the serious outbreak of typhoid fever at Worthing, liberal subscriptions have been made to a fund for that purpose, but we learn from a circular issued by the Mayor of Worthing that it is inadequate to meet all the claims made upon it. On behalf of the chemists of the town, Mr. William Frost has therefore requested us to give publicity to this fact, and to ask the kind help of their brother chemists in support of the attempt they are making to alleviate the sad condition in which so many of their townsmen are now placed.

## UNITED STATES PHARMACOPŒIA.

Though we have not yet received a copy of the work, we understand that the new edition of the Pharmacopœia of the United States of America has been published. It is the result of the seventh decennial revision (1890), and will become official on January 1, 1894.

# British Pharmaceutical Conference.

## MEETING OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at the Exchange Hall, Nottingham, on Monday, the 14th inst., at 4.30 p.m.

Present:—Mr. O. Corder (President); Messrs. F. B. Benger and R. Fitzhugh (Vice-Presidents); Messrs. Gerrard, Gill, Payne, Wright, and Wilford; Mr. Bolton (Hon. Local Secretary); and Messrs. Naylor and Ransom (Hon. Gen. Secs.).

The minutes of the previous meeting were read and confirmed.

A draft report for presentation at the annual meeting was submitted by the Hon. Gen. Secs. and was agreed to.

The Treasurer's financial statement for the year 1892–93 was read and approved.

A letter was also read from the Treasurer (Mr. R. H. Davies) stating that in consequence of ill-health he felt compelled to resign his position.

The senior Secretary was requested to acknowledge the letter and, whilst accepting the resignation, to express the thanks of the Committee for the valuable services rendered to the Conference by Mr. Davies in his position as Treasurer, and to express the hope that he might be soon restored to complete health.

A proposed list of officers for the ensuing year was adopted for recommendation to the general meeting for election.

The draft programme for the proceedings of the sittings of the Conference was laid on the table and approved.

The place of meeting for 1894 was considered. Letters were read from Messrs. Druce and Matthews, of Oxford, expressing the hope that the Conference would hold its next sessions in that city.

Mr. J. C. Nightingale was appointed Assistant Secretary in the place of Mr. Johnson, whose resignation was announced at the previous meeting.

Eighteen gentlemen, having been duly nominated, were elected to membership.

## MEETING AT NOTTINGHAM.

### FIRST DAY'S PROCEEDINGS.

(*Continued from page* 158.)

### Reading of Papers.

The reading of papers was then proceeded with.

### A Report on Coto Bark. Part I.

BY W. ELBORNE, B.A. CANTAB., F.L.S.

The following communication results from inquiries instituted with the object of ascertaining the botanical origin of coto bark.

In the Unofficial Formulary of the British Pharmaceutical Conference,[*] coto bark is described as follows:—"A bark of unknown origin, obtained from Bolivia, in flat or curved pieces about 1 centimetre in thickness, and of variable length. The taste is aromatic and very biting. The transverse section is of a cinnamon-brown colour externally, and darker towards the inner surface." This bark, however, very seldom appears in commerce; a bark, nevertheless, very similar to it in colour, external appearance, and texture, is more regularly met with, but it does not contain cotoin, the active principle of the true coto bark. This more frequently occurring bark, so closely allied in appearance to the true bark, is assumed to be yielded by a tree belonging to the same genus as the plant yielding the true bark, and has been designated paracoto bark, but its botanical origin is likewise unknown.

E. Merck, of Darmstadt, in one of his circulars (1887), remarks as follows:—"It may be of interest to know that the real coto bark is very seldom obtainable; whatever appears in the market is para bark.[*] The outside appearance of both kinds is almost the same, and it is only by ascertaining the presence of cotoin and paracotoin that the difference is found. Cotoin, first isolated by Hesse, is a crystallisable substance of the composition $C_{22}H_{18}O_6$; soluble with difficulty in cold water, easily soluble in hot water, alcohol, and ether. Concentrated nitric acid dissolves it, giving a blood-red solution. In the paracoto bark, a too readily crystallisable substance of less active properties is found, which is called paracotoin. This preparation, which corresponds with the formula $C_{19}H_{12}O_6$, turns yellow with nitric acid, and is less soluble than true cotoin. These substances therefore stand to each other in the same relation as quinine to cinchonine. The other ingredients of coto bark are without any valuable properties."

In a private letter dated November 19, 1889, Mr. E. Merck informed me that the genuine coto bark is found, it is understood, in Amazonas, a province of Brazil.

A.

Among the results of my inquiries regarding coto is the following:—In 1885 I forwarded to my cousin at Bogota, among other drugs for identification, some genuine coto bark. The following is abstracted from his letter in reply:—

Santa Fé de Bogota,
U.S. Colombia,
South America.
Sept. 17, 1886.

. . . . . . . . As for the coto bark, no one here has ever heard of such a name for bark, but a botanist out here, to whom I have shown it, recognised it as canelo bark, and says it is yielded by a tree called Drimys. The same person says that the Drimys grows on the coast of this country, and of Venezuela . . . . . . . Coto in Spanish means *goitre*.[†]

Yours, etc.,
F. F. Newcombe.

Upon reference to a Spanish dictionary I found that the word "canelo" was the Spanish for cinnamon, and under the word "canelón," "a kind of bastard cinnamon growing in Bogota, commonly called *Canelon de Santa Fé*."[‡]

The following are other references from works on materia medica:—Canelo, "the name of a bark brought from Chili by Dombey, belonging to a variety of *Drimys Winteri* (natural order Magnoliaceæ)."[§]

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[*] 'Year-Book of Pharmacy and Transactions of the British Pharmaceutical Conference,' 1888.

[*] For a description of paracota bark, cotoin, and paracotoin, vide *Pharm. Journ.*, [3], vii., pp. 495, 1019; x., pp., 521, 541.

[†] Coto bark has been used in this country for that affection. W.E.:—"I may add that I suggested its use in a case of exhaustive and uncontrollable diarrhœa in one of the graver forms of *exophthalmic goitre*, which I saw in consultation with my friend, Dr. Chaning Pearce, of Brixton; and he has since informed me that it not only arrested the diarrhœa, but also appeared to have a remarkable influence in allaying the distressing nervous phenomena associated with the case. I am quite sure that coto bark is a valuable remedy which ought rapidly to come into general use."—J. Burney Yeo, M.D., *Practitioner*, Oct., 1879.

[‡] Neuman and Baretti's 'Dictionary of the Spanish and English Languages.' Edited by M. Seoane, M.D. 4th ed.

[§] Dictionnaire Universel de Matière Medicale' (Merat and de Lens). Paris, 1830.

"*Le Drimys magnoliæfolia* a aussi l'écorce aromatique, et appelée *Canelo* par les Espagnols; elle appartient au *D. punctata*, d'apres d'autres."[*]

Canelo, "*Drimys magnoliæfolia*, *D. granatensis*, and two other species not well known."[†] Daniel Hanbury, in his classical paper on "Cortex Winteranus,"[‡] alludes to it as follows:—"*Drimys Winteri*, Forst., is, however, widely distributed, for according to J. D. Hooker ('Flora Antartica,' part II., p. 229), on whose opinion I lay great weight in questions of this nature, the species known as *Drimys chiliensis*, DC., *D. granatensis*, Linn., fil., and *D. Mexicana*, DC., are only forms of one and the same plant. We also know for certainty that Winter's bark is not collected in the Straits of Magellan; that the same is collected on the contrary, and moreover is in use, in Chili, where it is known as canelo, as also in New Granada and Mexico."

The above quotations show, therefore, that canelo is a drug intimately associated with the genus *Drimys*, and that the Bogota district is noted for a certain kind known as "Canelan de Santa Fé." I send genuine coto bark to Bogota, where it is recognised as being canelo, and the question naturally arises—is coto bark the recognised Canelan de Santa Fé? This question I cannot answer at present, having only quite recently come to the knowledge of the existence of such a bark (4th edition of Spanish dictionary, already quoted).

Being familiar with the specimens of true Winter's bark (a very rare drug,[§] seldom met with outside museums) as occurring in the collections of the Pharmaceutical Society in London and the École Supérieure de Pharmacie de Paris, I did not attach undue significance to my Bogota correspondent's communication, from the fact that neither coto nor paracoto bark possessed the histological structure of Winter's bark (coto barks possess a conspicuously fibrous fracture, Winter's bark a short earthy fracture, both, however, a reddish brown colour and a burning taste). Furthermore, discovering the indiscriminate manner in which the term canelo[‖] (canella, *Lat.*, canelle, *Fr.*, canela, *Ital.*) was applied to designate substances of a pungent and spicy nature, I regarded with much diffidence the clue of coto being known in Bogota as "canelo," and in consequence abandoned it.

Strange to say, however, a subsequent yet totally different line of inquiry (to be considered below in section B) led me again to the same perplexing result, viz., *Drimys*; this accordingly necessitated my resuming the subject of canelo, and I found that a French author had recently been involved in a canella embarrassment. In a most interesting and elaborate thesis[*] on coto bark, Mons. Laborde states as follows:—"I ought here to speak of a Lauraceous (? W.E.) bark known as *Canella amargosa*, which M. Sanpaio, a pharmacist at Yaccarchy (Brazil) has had the kindness to forward me, and which in that country is regarded as a coto. After having studied its histological structure, I find in it many points of resemblance to the bark of *Coto-verum*; nevertheless, it cannot be confounded with it on account of its thick suberous layer and absence of sclerenchyma beneath the suber." Being desirous of inspecting this *Canella amargosa* bark, I wrote to both M. Laborde and M. Sanpaio requesting a small specimen of the same, but some years have elapsed without reply. I would here draw attention to a couple of references alluding to a region in Ecuador, in proximity to the districts actually yielding the true coto, mentioned as yielding canelo. In the Hanbury collection in the Pharmaceutical Society's Museum there are specimens of the bark and calyx (labelled Ishpingo) of a tree yielded from the above district; they, however, possess no resemblance to coto, and the tree yielding them is still unknown to science (cf. 'Pharmacographia,' p. 534).[†]

## B.

At the sixty-second meeting of the Deutscher Naturforscher und Aerzte, held at Heidelberg in 1884, there was exhibited by a Continental chemical firm of repute a collection of fine chemicals and active principles of rare plants, among which latter were the following specimens of coto derivatives:—

No. 15. Cotoin aus der Bolivia-Rinde, $C_{22}H_{18}O_6$.
" 16. Cotoin aus der Venezuela-Rinde.
" 17. Dicotoin, $C_{44}H_{34}O_{11}$.
" 18. Paracotoin, $C_{19}H_{12}O_6$.
" 19. Hydrocotoin, $C_{15}H_{14}O_4$.
" 20. Leucotin, $C_{34}H_{32}O_{10}$.
" 21. Oxyleucotin, $C_{34}H_{32}O_{12}$.

Samples of the raw materials from which the various plant derivatives had been isolated were also exhibited, including the barks corresponding to the above-mentioned two samples of cotoin. Desirous of increasing my stock of coto specimens, I obtained possession of these cotoins (Nos. 15 and 16) and their corresponding barks: the "Bolivia-Rinde" was genuine coto bark, whereas the "Venezuela-Rinde" was a fine sample of Winter's bark (*Drimys Winteri*, var. *granatensis*), it being labelled "Coto-Rinde von Merida (Los Andes) Venezuela." This Venezuela so-called cotoin having been subseqently obtained in exceedingly fine sulphur-yellow transparent crystals, the head of the firm, in consideration of my interest in the subject, kindly forwarded me, unsolicited, a glass tube full of these fine crystals (value 15*s.*) for my inspection; on their return journey, however, they got lost in the post.

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[*] *Loc. cit.*

[†] 'A Supplement to the Pharmacopœia.' By S. F. Gray. 5th edition. London, 1832.

[‡] 'Science Papers.' London, 1876 (translated from the original paper in *Neues Repertorium für Pharmacie*, band xi., heft 6, p. 241).

[§] "Although the bark of *Drimys* was never imported as an article of trade from Magellan's Straits, it has in recent times been occasionally brought into the market from other parts of South America, where it is in very general use. Yet so little are drug dealers acquainted with it, that its true name and origin have seldom been recognised. We have seen it offered in a drug sale at one time as 'Pepper Bark,' at another as 'Cinchona.' Even Mutis thought it a cinchona, and called it *Kinkina urens*! . . . . It is a stimulating tonic and antiscorbutic, now almost obsolete in Europe. It is much used in Brazil and other parts of South America as a remedy in diarrhœa and gastric debility" ('Pharmacographia,' Flückiger and Hanbury, London, 1879).

[‖] Canela de ema, *Arundo Phragmites*, L.

Canella, Span. and Port. for *Laurus Cinnamomum*, L.

Canella blanca, Span. and Port. for *Canella alba*, Murr.

Canella do brejo (Rio), Span. and Port. for *Talauma ovata*, St. Hil. (Magnoliaceæ).

Canella do brejo (St. Catharina), Span. and Port. for *Nectandra leucothyrsa*, Mss.

Canella do funcho, Span. and Port. for *Mespilodaphne Sassafras*, Mss.

Canella de Ceylon, Span. and Port. for *Cinnamomum zeylanicum*.

Canella do mato, Span. and Port. for *Linaria aromatica*, Arrud.

Canella mulatinha, Span. and Port. for *Nectandra amara*, Meiss.

Canella foedorenta, Span. and Port. for *Nectandra myriantha*, Meiss.

Canella preta, Span. and Port. for *Nectandra mollis*, Nees.

Canella parda, Span. and Port. for *Agathophyllum aromaticum*, L.

Canella sassafras, Span. and Port. for *Mespilodaphne indecora*, Mss.

Canella de veado, Span. and Port. for *Actinostemum lanceolatum*, Fr. Allem.—Peckolt, *Pharm. Journ.*, A 4, 1883.

[*] 'Etude des Ecorces de Coto,' par J. Laborde. Paris: J. B. Baillière et Fils, 1886. [This work (40 pages) contains good engravings of transverse sections of coto, paracoto and canella amargosa barks.]

[†] 'History of the Conquest of Peru' (W. H. Prescott), vol. ii., p. 142. London, 1847. A cheap edition of this work (containing a map showing the above district) has recently been reprinted by Messrs. Routledge, edited by John F. Kirk, 1890. Stanford's 'Compendium of Geography and Travel, Central America' (H. W. Bates), p. 215. London, 1882. [In a chapter devoted to S. American tribes and languages (page 510) *Cotos* is alluded to as "a tribe of the Amazon group, left bank of the Lower Napo.]

The dissimilarity in structure between coto and Drimys barks having already been commented upon, the next point to be determined was whether the so-called Venezuela cotoin (No. 16) was actually cotoin.* In taste and physical appearance it resembled cotoin; its qualitative reactions were found to correspond with the published reactions of cotoin,† and it possessed exactly the same melting point, viz. 130° C.

In 1890 a careful quantitative analysis was kindly undertaken by my colleague (at Owens College, Manchester), Julius B. Cohen, Ph.D., at that time Assistant Lecturer on Chemistry. In a letter dated May 8, 1890, he writes:—"Your substance (Venez. cotoin) has been analysed with the following results: the compound corresponds to $C_7H_6O_2$ almost exactly. No doubt this number should be multiplied by a factor." These numbers multiplied by three give the formula $C_{21}H_{18}O_6$. These results are sufficiently interesting to warrant an extended investigation of this portion of the subject, which I hope in due course to be able to pursue. At the same time it should be borne in mind that in the materia medica we have several instances of genera widely separated yielding products chemically identical, so that the possible establishment of any chemical connection between the active principles of coto and Winter's bark would not prove any botanical connection between the plants yielding them; in consideration of the commercial confusion of the two barks in question the facts elicited are, nevertheless, sufficiently remarkable.

The subject of this particular Venezuela bark having been introduced at an evening meeting of the Pharmaceutical Society (London, December, 1890), the following remarks, made by Mr. E. M. Holmes, are very opportune:—"Among the specimens presented to the Museum was a specimen of bark and leaves of a tree called 'coto' in Venezuela. These had been examined in Berlin and found to be those of *Drimys Winteri*, var. *granatensis*, and a statement had been published in a German journal to the effect that this tree was the source of coto bark. But this so-called coto bark came from Venezuela, and was quite a different drug to the coto and paracoto barks of commerce, although it had like them a hot or pungent taste. The true coto bark came from the same districts as the coquetta cinchona bark, and the paracoto from the banks of the Mapiri river. The structure of these barks was quite different from that of *Drimys granatensis*, and if a guess might be hazarded, was probably lauraceous rather than magnoliaceous. The name 'coto' was also applied to a rubiaceous tree in Brazil, *Palicurea densiflora*. Indeed, the native name of a drug in South America was not the slightest guide to its botanical source, except in the particular district where it was used. In another province the same name was frequently applied to a totally different plant."‡

Having applied to the museum department of the Pharmaceutical Society for any information that could be supplied me on the subject of coto, I received the following reply:—

"July 28, 1893.

"Dear Mr. Elborne,—There are two or three specimens of coto bark in the museum which possess so much interest that I had thought when cataloguing the Hanbury materia medica collection to make a note concerning them. As, however, you are investigating the botanical source of coto bark, I have much pleasure in giving you the details I possess.

"I. There is in Dr. Pereira's collection of materia medica the following note in his writing appended to a specimen in his series of cinchona barks:—'Bark having a strong flavour of spice and pepper, brought in the ship Salem from Santa Marta (New Granada) with serons or bales of cinchona bark, May, 1852, consigned to Mildred (?) and Co., 9, New Broad Street.' I am not sure that I have spelt the name of the consignee correctly, as the writing is not quite clear.

"This bark is the kind we now know as genuine coto bark.

"II. In the Hanbury collection of materia medica there are three specimens of bark, labelled by Mr. D. Hanbury, '*Cortex Paratodo novus*, (1) imported from Arica in 1852; (2) imported also in 1852; (3) obtained in Bogota by A. J. de Warcsewicz and sent to me from Guayaquil. A. J. de W. states that it is a native of Pamplona, New Granada.' The 1852 specimen has the thick character and prominently striated inner surface of paracoto bark. The other two specimens correspond to true coto bark. One of the specimens of true coto bark has the following label attached to it, in Mr. D. Hanbury's writing, '*Cortex Paratodo novus*, according to Dr. J. Martiny, who examined this sample and said that the bark had not been described. This specimen is from two serons of the bark imported from Arica and offered for sale as Winter's bark by C. L. Jenkin, August 21, 1851. I think it fetched 2d. per lb.—D.H.' You will thus see that coto apparently first came into commerce in 1851, and that it was, even forty years ago, confounded with Winter's bark, a mistake that is quite natural, since both have a very hot pungent taste, and merchants and brokers in those days knew but little of histology. The paratodo bark of Brazil is generally referred to *Cinnamodendron axillare*, Mart., which has, I think, nothing to do with coto bark, although Cinnamodendron, like Drimys, has an exceedingly hot, biting taste; but a comparison of the pungent principle of *Cinnamodendron corticosum* with that of coto barks might prove instructive from a chemical point of view.

"III. A specimen of coto bark from Venezuela, with leaves of the tree, was presented a few years ago by Dr. Schuchardt, of Goerlitz, as the genuine coto. An examination of the specimen showed that this was not true coto, but Winter's bark, and an examination of the leaves confirmed the identification.

"IV. During the past week Dr. H. H. Rusby, Professor of Botany and Materia Medica in the College of Pharmacy in New York, presented this Society with a 'coto' bark and leaves of the plant, obtained by his collector in Bolivia. This comes much nearer to true coto bark, but has less pungency and a distinct bitterness, which I have not observed in genuine coto bark. The herbarium specimen presented with the bark consists only of leaves, which Professor Rusby, after a careful comparison at the Kew Herbarium, refers to the genus Aydendrone (Lauraceæ).

"With respect to the histology of Winter's bark, an illustration of the *Drimys Winteri*, var. *Granatensis* (= *D. Granatensis*, L.) is given by Herail and Bonnet, 'Manipulation de Botanique Medicale' (p. 215), pl. xvi., fig. 1.

"Yours very sincerely, E. M. HOLMES."

From the above it seems, therefore, that while "coto" bark under that name was introduced in 1873, the bark itself came into commerce under other names, and was confounded with Winter's bark so far back as 1851.

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* Winter's bark has not yet been chemically investigated.

† *Pharm. Journ.*, [3], vol. x., 541.

‡ *Pharm. Journ.*, December 13, 1890.

C.

Owing to the predominant opinion of coto being yielded by a lauraceous plant, the discovery of any new member of that order in proximity to the district yielding coto bark constitutes a desideratum with reference to the determination of the botanical origin of coto. I allude to the quite recent discovery of a lofty evergreen forest tree, a native of the province of Cundinamarca, which is not far from Bogota, and described in the *Pharmaceutical Journal*, June 24, 1893, by Dr. T. Bayon, of the National University at Bogota, as *Laurus giganteus*. The tree in question is stated to yield by incision an aromatic balsam, and the seeds to possess a burning taste like capsicum, whereas the bark of the tree does not yet appear to have received attention.

In conclusion, the amount of active principles yielded by coto and paracoto respectively is approximately as follows :—

Coto bark, from 1·28 to 1·5 per cent. of cotoin.
Paracoto bark, 1·25 per cent. of paracotoin.
„ „ ·012 per cent. of oxyleucotin.
„ „ ·025 per cent. of leucotin.
„ „ ·009 per cent. of dibenzoylhydrocotoin.
„ „ ·008 per cent. of hydrocotoin.

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The **President**, in inviting discussion, said he remembered some fifty years ago, when he was apprenticed at Exeter, a large parcel of *Drimys Winteri* arrived, which his fellow apprentice, George Dymond, marked " Cabbage tree bark, found somewhere to the north of Patagonia." This paper, he thought, cleared up the question which in their youthful ignorance they were hardly aware of, whether cabbage tree bark and Winter's bark were identical. He did not know whether that parcel was still in existence. If so, it might still prove useful.

Mr. **Lake** (Exeter) said he believed he still had the specimen referred to, but he had never made any examination of it, and could not therefore add anything to the information contained in the paper.

Mr. **Gerrard** said he remembered some years ago working at a large sample of what was known as ordinary coto bark, for the purpose of extracting cotoin. They then came to the conclusion that cotoin was a mixture of bodies, not a pure substance. He gathered that the author was of opinion that cotoin and paracotoin were the same substance, and if so he should like to ask him if there were any solvents which would differentiate them from each other.

Mr. **Naylor** said he had understood from a conversation with Mr. Holmes that there was a method of distinguishing between the true cotoin and the paracotoin bark by acting on the crude drug with nitric acid. It was interesting to know that Winter's bark yielded a cotoin, and although it did not follow from the analyses yet made that it was identical with cotoin, it might possibly be isomeric with it. It would be interesting to know if any experiments had been made to see if it had the same physiological action as cotoin from the true coto bark.

Mr. **Elborne**, in reply, said the President's remarks about the package of *Drimys Winteri* from Patagonia were of extreme interest, and he should hope to be favoured with an inspection of the bark in question. Mr. Gerrard was no doubt correct in saying that there were two kinds of cotoin in commerce, the ordinary cotoin being often a mixture; but there ought to be no difficulty in obtaining pure cotoin, which crystallised in beautiful large crystals. He certainly did not intend to convey the impression that cotoin and paracotoin were identical substances, quite the reverse; in fact, the paracotoin did not contain the active principle at all; it yielded a more readily crystallisable substance which was not pungent, was altogether distinct from cotoin, and had a different formula. With nitric acid cotoin gave a blood-red colour, and paracotoin a yellow, and that was a ready test for distinguishing the barks. Probably the best method of making the test would be to make an alcoholic extract of the bark, evaporate to dryness, and then apply the acid. The physiological action of the active principle yielded by the Venezuela bark had not yet been tested; he had only recently taken up the matter, and as yet a sufficient quantity had not been obtained to allow of this to be done. He had only about ½ gramme for exhibition at this meeting, but he hoped at some future time to be able to prepare enough for comparative experiments to be made.

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## PHARMACEUTICAL EDUCATION IN NOTTINGHAM.

BY PROFESSOR FRANK CLOWES, D.SC., LOND.,

*Professor of Chemistry in the University College, Nottingham.*

A request having reached me from official quarters to prepare a paper for the British Pharmaceutical Conference meeting in Nottingham, I felt bound to make a practical response, and, in selecting a subject, my desire was that the paper should treat of something distinctly local in its character and yet capable of arousing general interest amongst the members of the Conference. No subject appeared to possess these two qualifications in the same degree as that which has been finally selected, and selected, I may say, with the full consent of the deputy-mayor of this town and of the energetic honorary local secretary, to both of whom local pharmaceutical education largely owes its development, if not its birth.

My acquaintance with the educational work carried on in Nottingham dates back some twelve years. Coming into the town as one of the original professors of the University College, I found more than enough to do in founding and organising the chemical department of that College. Of systematic chemical education there had been but little existent before the College was started, but that state of things has been improved upon largely by the desire of the inhabitants, but largely also owing to the fact that the superior equipment and staff of the College, and later on of the secondary schools, provided the means of imparting chemical instruction in such a way as had never before been possible.

But there had existed for many years before the foundation of University College, an association which practically corresponded to one of the ancient trade guilds—an association whose object it was to fully equip educationally the young pharmaceutical chemist for his future career. I refer to the Nottingham and Notts' Chemists' Association. Of the constitution of this Association I need say only this, that it subsisted mainly on the funds supplied by the master pharmaceutists already established in the town, the money thus contributed being mainly spent on educating their youthful assistants and apprentices. The teaching work was undertaken by members of the Association best qualified by their superior knowledge, and by their power of communicating it, to educate the younger men, and from all I can hear the teaching and learning was carried on, not only with much regularity and system, but also with much enthusiasm.

When the University College started, the Managing Committee of the Chemists' Association saw their opportunity of further improving their course of instruction. They decided to transfer their classes to the College, and to place the teaching in the hands of the College staff. I have a very vivid recollection of an interview which took place between delegates sent from the Chemists' Association Council and the new Professor of Chemistry, in which the Professor was sounded as to his willingness to take charge of a special class in pharmaceutical chemistry, and, if possible, to arrange for the teaching of other scientific subjects, a knowledge of which was necessary to the pharmacist. It is almost unnecessary to add that the Professor rose to the occasion, and that the classes were soon earnestly at work in their new quarters. A recent experience of German university life, pérhaps, led the Professor to look to the very thorough training there given to the *Pharmaceuten* as the ideal to be aimed at. In these universities the young pharmacist gives his whole time for at least two years to instruction in chemistry, physics, botany, and other necessary subjects. This teaching is not interfered with by any business except the much-dreaded compulsory military service. This ideal may be a good one, but an experience of nearly twelve years has shown it to be impracticable in this time and in this place. And it may be stated at once that there are advantages (even though there are also disadvantages) in spreading the instruction over a longer time, and allowing it to be given to young men already engaged in their life-business. The main advantage is that they obtain by this system a practical interest in their education, which they can scarcely feel when they have not any experience of its necessity and of its application. The main disadvantage is that their working time is frequently too much monopolised by their business; and they are thus left to pursue their education when weary and jaded, and they really have to devote time which should be spent in rest or in wholesome recreation to the attempt at serious study.

However, I am anticipating by introducing thus early the fruits of experience. We soon found that so great a revolution as the immediate introduction of the German pharmaceutical course into Nottingham was not to be thought of for a moment. And I may say at once that I for one am not wholly disappointed by this discovery. As a rule much more satisfactory results are arrived at by working out a system of education suited to the country and the locality in which it has to be given than by adopting the ready cut-and-dried system of another locality, and especially of a foreign country. And I am patriotic enough to believe that, while we may learn much from studying carefully all educational systems, even those of foreign countries, and although such study may show us that we are much behindhand in our own system, Englishmen will, if left to their own devices, slowly and patiently work out an improvement on their own methods which will be in every sense more satisfactory than a wholesale adoption of those of others.

It is such a development of our own English methods which I believe has been going on slowly and gradually in our pharmaceutical classes in Nottingham. The result is briefly this: we have now a three years' course of instruction given at the College, which embraces pharmaceutical chemistry, both practical and theoretical, pharmaceutical botany, materia medica, practical dispensing, and physics, both theoretical and practical. This course prepares a student fully for the Minor examination of the Pharmaceutical Society, whilst arrangement is easily made for his continuing his study for the Major examination if he desires to do so. The amount of time which each student devotes to his work at the College is not large, probably not so large as it should be; but it has enabled many to pass their qualifying examination without further aid, if they are of a studious character. And it must be remembered that although much of their time is spent away from the College, such time is spent in learning their business, and in ensuring that they shall be practical men and not mere book-worms or theorists.

That the system at present at work in our College is perfect and entirely satisfactory, no one of us would claim or even hope. But that it has gone a long way towards showing the way to secure the decentralisation of pharmaceutical education, and towards combining satisfactorily the student's training with the business training of our young pharmacists, I think it would be impossible to deny. It should be possible for young would-be pharmacists in our larger towns to obtain slowly, and in a way in which they can thoroughly digest and assimilate it, the education they require. They should not be forced to reside for a period all too brief in our great metropolis, and there be fed with highly concentrated educational food in doses far too large to permit of its digestion and assimilation. This is usually the only alternative to laborious and discouraging private study in their provincial home, since the very admirable metropolitan college is only available to such as are occupied in business in the metropolis in a sufficiently accessible neighbourhood, or to those who can either obtain one of the few available scholarships, or can afford to live the life of students for two or three years without earning at the same time their daily bread. The latter class, I need scarcely add, is an extremely small one, and may almost be left out of consideration. Is it too much to hope that in the many provincial centres which now possess university colleges and technical schools, something of a kindred nature to that successfully attempted in Nottingham may be done towards helping the education of young pharmacists? and that thus the decentralisation of education, already so far advanced in other branches, may become a reality also in pharmaceutical training.

It will be seen at once that success in the direction indicated implies the hearty co-operation of the pharmacists and of the teachers in each centre. This has been fortunately secured in Nottingham. And the gentleman who has perhaps most largely led to the result is our present deputy-mayor, who was at the same time President of our Chemists' Association and Vice-Chairman of our University College Committee. It is necessary to add that Mr. Fitzhugh's success was largely due to his being the representative of, and to his being loyally supported by, other members of both the Councils over which he presided. It will certainly also be possible to mention, without being suspected of having made any invidious selection, the name of Mr. Bolton as having been active in this scheme. But I should also wish to chronicle the names of Professor Blake, M.A., Mr. Carr, M.A., Mr. C. Haydon White, M.R.C.S., Professor Heaton, M.A., and of Mr. Sargeant, who have one and all as teachers done their utmost to further the scheme of pharmaceutical training in our local college The experiment has now almost passed beyond the experimental stage. We shall undoubtedly continue to improve the course, but the work already done is such as not only pays in examination, but pays also in a sense which is far higher and more satisfactory. It makes our pharmacists thoughtful and sincere; it abolishes a sham education in favour of a more real one, and it tends to give that higher tone of mind and character which is obtained by association with those who are studying truth and knowledge for their own sake, and not merely in order to secure the substantial rewards which they may bestow.

I have been privileged year by year to hear the remarks of some of the examiners at Bloomsbury Square, before whom these young men have to present themselves; and, casting aside all that must be taken as unduly appreciative and complimentary to us as teachers and originators of our scheme of training, I can assert without undue pride or satisfaction that the examiners undoubtedly detect in many of our candidates the advantageous results which I have already laid claim to.

Is it too much to anticipate that, with the growth of a wide-spread and properly organised system of education, leading up to a suitably high examinational standard (now, let us hope, attained at last), the status of the English pharmacist may be recognised as it is already recognised in continental countries, and that many of the serious troubles which beset him may become things of the past?

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The **President** said he would tender the thanks of the meeting to Professor Clowes for his thoroughly practical paper. There was no need to discuss it, but it exemplified what had been already hinted at, that men who obtained their training at such schools or colleges as that at Nottingham could easily be detected when they came into the examination room at Bloomsbury Square. Men who had had a three years' course of study must occupy a much higher position than those who had only three or four months, and many could not afford more. Still, if men really had a desire to study, there was no difficulty in carrying it out. The great difficulty was to arouse the desire; it was all right to have time for pleasure and relaxation, but during a three or four years' apprenticeship some definite time should be devoted to serious study.

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## NOTE ON COLLODIUM BELLADONNÆ.

BY R. WRIGHT,

*Pharmaceutical Chemist.*

The above preparation, as originally introduced by Dr. H. Miller, and prepared by Messrs. T. and H. Smith, of Edinburgh, was a solution of an alcoholic extract of belladonna leaves in collodion and spirit of camphor.

On its inclusion in the Conference Formulary in 1891, the alcoholic extract of the root was substituted for that of the leaves, the idea being that as the root extract had been introduced into the British Pharmacopœia as a substitute for the green extract previously employed, it would be likely to be equally serviceable for the preparation of the fluid as for the solid plaster.

Such, however, has not proved to be the case; and the formula, as it now stands, is probably less satisfactory than any other included in the Formulary.

The process was criticised by Conroy in a note read before the Liverpool Chemists' Association (*Pharm. Journ.*, [3], xxii., 327). He showed that when the official root extract was employed, only about one-eighth of the extract and two-fifths of the alkaloid were dissolved.

By using a rectified spirit extract slightly better results were obtained, about one-fifth of the extract and three-eighths of the alkaloid passing into solution.

The statements of Conroy as to the unsatisfactory nature of the preparation were corroborated by J. C. Umney (*Pharm. Journ.*, [3], xxii., 364). According to Umney, the results obtained with an alcoholic extract of the leaves were little better than with the root extract. Of three samples of leaf extract employed, one was soluble to the extent of 85 per cent.; the two others to the extent of 21 and 38 per cent. respectively.

From these results it is evident that the Formulary recipe will need revision, and this being the case, it appears to me to be an opportune time to raise the question as to whether, seeing that the reputation of this medicament was made upon a leaf preparation, it would not be advisable, in a future formula, to go back to the leaves as the source of the extract. The chief objection to the employment of a leaf extract for the preparation of the solid plaster was the soiling of linen through the running of the plaster; but this objection does not apply to the collodium belladonnæ, seeing that the green colouring matter is fixed by the collodion. If the leaves are employed, either a solid or liquid extract, prepared with strong alcohol, will have to be made the basis of the preparation. As the result of several experiments and estimations, I find that it is quite possible by repercolation to prepare a fluid extract of belladonna leaves sufficiently strong to warrant its employment for the preparation in question. The following is therefore suggested as an improvement upon the existing formula.

(*a*) Take of—

| | |
|---|---|
| English belladonna leaves in fine powder | 1 pound. |
| Rectified spirit, a sufficient quantity. | |

Moisten half a pound of the powdered drug with menstruum, pack in a conical percolator, add a further supply of menstruum, allow percolation to proceed, and collect the percolate in three fractions of six fluid ounces each. Moisten the rest of the powder with a little of the first fraction of percolate, pack in a second percolator; pour over it the remainder of the first fraction of the percolate, and when that is absorbed, add the second fraction, and finally as much of the third fraction as may be required to produce eight fluid ounces of percolate.

This fluid extract should contain not less than ·5 per cent. alkaloid.

(*b*) To produce collodium belladonnæ—

Take of—

| | |
|---|---|
| Fluid extract of belladonna leaves | 10 fluid ounces. |
| Pure ether, sp. gr. 720 | 10 fluid ounces. |
| Camphor | 130 grains. |
| Pyroxylin | 183 grains. |
| Canada balsam | 365 grains. |
| Castor oil | 183 grains. |

Mix the fluid extract of belladonna with the ether, and add the other ingredients. Set aside for a few days, and then decant.

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## LIQUID BELLADONNA PLASTER.

BY W. A. H. NAYLOR.

The formula from which this preparation is directed to be made as given in the B.P.C. Unofficial Formulary has been subjected to experimental criticism, with the result that an alteration in its construction is urgently needed.* Conroy has demonstrated by actual experiment "that taking the alkaloidal content as the basis of valuation, more than one-half is wasted," and J. C. Umney† has supplied analytical data that evidence wide differences in strength in the alcoholic extract of belladonna root of commerce. Judged by these two sets of experiments alone, the formula as it at present stands cannot by any method of compounding be made to yield a satisfactory product. In the absence of any record of analytical results from which a working formula could be devised or built up, I venture to submit a few facts that have been verified by me several times, and also to present an improved process for the manufacture of this preparation. Any process that claims to be efficient must, in my judgment, meet the following requirements: It must be one which withdraws the whole of the alkaloidal content from the crude drug and introduces it with a minimum of loss into the final product. Further, the solvent selected must be such as not only admits of the dissolution of the active principle or principles in their state of natural association, but also withdraws a maximum of extractive.

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* *Pharm. Journ.*, [3], xxii., 327.

† *Pharm. Journ.*, [3], xxii., 364.

It will doubtless be conceded that the article in demand is one made from the leaf and not the root of belladonna, and I therefore recommend the substitution of the former for the latter. A selection from a number of experiments made by me may now be briefly outlined, and their results summarised. Five distinct extracts were prepared—one from absolute alcohol, two from alcohol of 94 per cent., one from rectified spirit (84 per cent.), and one from alcohol of 65 per cent. In each case the leaf was reduced to No. 20 powder and percolated with its menstruum until deprived of its alkaloidal principle. After recovery of the spirit by distillation, the residue was evaporated over a water-bath to the consistence of a stiff extract. One of the two extracts from the 94 per cent. alcohol was washed to exhaustion with water. The several extracts were next examined for alkaloid by Dunstan and Ransom's method, and their moisture determined by loss at 212° F.

The following table sets forth the result:—

| Menstruum. | Per cent. yield of moist extract. | Per cent. of moisture in extract. | Per cent. of dry extract. | Per cent. of alkaloid calculated on dry extract. |
|---|---|---|---|---|
| 1. Alcohol absolute......... | 6·86 | 20·48 | 5·45 | 4·06 |
| 2. „ 94 p. c. ........ | 12·32 | 16·36 | 10·30 | 3·33 |
| 3. „ 94 p. c., washed | 2·00 | 4·5 | 1·99 | ·52 |
| 4. „ 84 p. c. ......... | 9·00 | 14·59 | 7·68 | 4·53 |
| 5. „ 65 p. c. ......... | 31·25 | 21·06 | 24·66 | 2·30 |

The next step was to ascertain the solvent capacity of a mixture of ether and rectified spirit in the proportion of three volumes to one on the series of extracts.

No. 5 extract contained too large a proportion of extractive soluble in water but insoluble in the ether-spirit mixture to be of service for the purpose required. Moreover, the brown extractive retained the larger portion of the total alkaloid.

No. 3 dissolved all but completely in the ether-spirit mixture, and in the proportion of four ounces in the pint, including the official quantities of camphor, pyroxylin, castor oil, and canada balsam, gave a product that, for elegance, left nothing to be desired. Inasmuch as the process is wasteful of active principle and expensive, it cannot be recommended without being open to the taunt of bad pharmacy.

No. 1 was soluble in the test mixture to the extent of little more than one half. Here, again, the cost of production forbids its use unless a less expensive and equally potent and soluble extract is unobtainable.

No. 2 extract: 53 grains equivalent to 44·32 grains dried at 212° F. were treated with 1 ounce of ether-spirit mixture, warmed, shaken at frequent intervals, and set aside for twenty-four hours to deposit. In an accurately measured quantity of the bright supernatant liquid the alkaloid was determined, and in a second quantity the amount of extract yielded on evaporation and drying of the residue at 212° F. The figures obtained showed that the equivalent of 10·97 grains of dry extract had passed into solution, giving by difference 33·35 grains as the weight of the insoluble residue. Practically only one-fourth of the extract was dissolved by the mixture. The result of the alkaloidal determination showed that ·65 grain had passed into solution, leaving by difference ·82 grain as the amount retained by the undissolved residue.

No. 4 extract: 40 grains of moist extract equivalent to 34·16 grains dried at 212° F. yielded up to the ether-spirit mixture the equivalent of 13·25 grains of dry extract, leaving by difference 20·91 grains as the weight of the undissolved portion. Of the total alkaloid, 1·548 grain, it was found that only ·403 grain had passed into solution, the remaining 1·145 grain being retained by the undissolved extract.

|  | No. 2 extract. Grains of dry extract. | No. 4 extract. Grains of dry extract. |
|---|---|---|
| Weight of moist extract taken equivalent to ..... | 44·32 | 34·16 |
| Weight of extract dissolved by ether-spirit mixture equivalent to ............... | 10·97 | 13·25 |
| Weight of undissolved extract by difference ......... | 33·35 | 20·91 |
|  | No. 2 extract. Grains. | No. 4 extract. Grains. |
| Weight of alkaloidal content present in extract taken......................... ... | 1·47 | 1·548 |
| Weight dissolved by ether-spirit mixture ........ ...... | ·65 | ·403 |
| Weight of undissolved alkaloid .... ...................... | ·82 | 1·145 |

These results reveal the fact that the mixture of ether and spirit 3 : 1 to extracts in the proportion here used is an incomplete and insufficient solvent of the active principle of the latter, regard being had to the complex character of the substance with which the alkaloids are associated. From other estimations that were made it was evident that the proportion of spirit to ether would require to be largely increased if the final product were to represent the potency of either one or other of the extracts. The best results were obtained by using a mixture of equal volumes of rectified spirit and ether. In support of this statement the following examples may be cited:—

|  | No. 4 extract. Grains. | Grains. |
|---|---|---|
| Weight of alkaloidal content present in extract taken......................... | 1·548 | 1·7415 |
| Weight dissolved by ether-spirit 1 : 1..................... | 1·426 | 1·5245 |
| Weight of undissolved alkaloid ......................... | ·122 | ·2170 |

The dry extract per fluid ounce amounted to 27·52 grains, and the undissolved extract to 6·64 grains.

Trial was made of the formula suggested by Mr. Linford, only substituting leaf extract for root:—

|  |  |
|---|---|
| Ext. belladonnæ (Fol)........................ | ʒ5 |
| Spt. camphor.................................. | ʒiiss. |
| Liq. ammon. ·880 ............................ | ʒij. |
| S. V. R. ....................................... | ʒiij. |
| Ether rect...................................... | ʒ × ij. |

The preparation after standing forty-eight hours gave a deposit that weighed 132 grains, and when assayed yielded 1·08 per cent. of alkaloid. The extract used contained 2·69 per cent., so that roughly a little more than one half of the active principle had passed into solution.

As a direct process, without the intervention of an extract, was greatly to be desired, a given quantity of leaf in fine powder (about No. 60) was treated with rectified spirit by a method of repercolation, so that 1 part by measure of the final product should represent 2 parts by weight of the drug. The marc was afterwards exhausted by percolation with rectified spirit and the percolate distilled and evaporated. The resultant extract per pound of leaf weighed 304 grains, and assayed 3·83 per cent., or 11·64 grains of alkaloid. The 8 fluid ounces of spirituous solution contained 14·63 grains, so that 55·68 per cent. of the total alkaloid had been removed by this process of repercolation. It does not therefore appear probable that a preparation of a strength 2 in 1 can be made by a direct method which will contain a proportion at all approaching to the totality of alkaloid present in the leaf. Discarding, therefore, the idea of obtaining a spirituous preparation without evaporation that would be satisfactory and of the strength required, two courses of procedure are open for adoption. Either the whole of the percolate from a given weight of leaves may be reduced by distillation and evaporation to an extract to be subsequently redissolved in the prescribed quantity of a mixture of spirit and ether, or a specified fraction of the percolate consisting of that first collected may be reserved and the extract from the remainder added thereto. As the latter method would be regarded as less objectionable than the former, I have framed my formula according to its principles. It is as follows:—

*Liquid Extract of Belladonna.*

Take of—

| | |
|---|---|
| Belladonna leaves in No. 60 powder... | 20 oz. |
| Rectified spirit, a sufficient quantity. | |

Moisten the powder with 15 fluid ounces of the spirit, pack it tightly in a percolator, and pour on sufficient menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop, close the lower orifice and macerate for twenty-four hours; then allow percolation to proceed, gradually adding menstruum until the belladonna is wholly deprived of alkaloid. Reserve the first seven ounces of the percolate, distil off the spirit from the remainder, and evaporate the residue to a soft extract; dissolve this in the reserved portion and add enough menstruum to make the liquid extract measure 10 fluid ounces.

*Liquid Belladonna Plaster.*

Take of—

| | |
|---|---|
| Liquid extract of belladonna... | 10 fluid oz. |
| Ether ............................ | 10 „ |
| Camphor............................ | 130 grains |
| Pyroxylin ........................ | 183 „ |
| Canada balsam .................... | 365 „ |
| Castor oil ........................ | 183 „ |

Mix the liquid extract and the ether, and set aside for twelve hours. Decant and dissolve therein the remaining ingredients in the order in which they occur in the formula.

The liquid extract of belladonna, which was prepared from English leaves, had a specific gravity of ·944, and contained 1 per cent. of alkaloid, or 4·154 grains per fluid ounce. The mixture of equal volumes of the liquid extract and ether, after decantation, had a specific gravity of ·800, and contained ·439 per cent. of alkaloid, or 1·534 grain per fluid ounce. In the preparation of the liquid extract it is prudent not to carry percolation beyond the point that suffices for the removal of the alkaloid, otherwise an unnecessary quantity of semi-liquid extractive of a brown colour will also be removed, which will be thrown out of solution on the addition of the ether. Further, the extractive will carry down with it a sensible quantity of alkaloid. If it be objected that a large portion of the dissolved matter of the liquid extract separates out on the addition of the ether, the answer is that the proportion retained in solution represents, under the conditions that obtain, the maximum solvent power of the mixture. It does not seem practicable so to vary the conditions as that a larger proportion of extract and alkaloid shall be maintained in solution, and the mixture, at the same time, shall act as a suitable and complete solvent of the remaining ingredients of the formula.

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The **President** said the large amount of extractive matter which was obtained in percolating the fluid extract of belladonna led him to ask the question whether a definite solution of atropine could not take its place.

Mr. **Linford** said the idea had occurred to him during the reading of the paper that the loss of alkaloid might be prevented by powdering the dried leaves sufficiently fine and then percolating with a mixture of two parts ether to one of spirit, having previously rendered them alkaline by ammonia. Atropine was perfectly soluble in ether and spirit, and therefore if the powdered leaves were percolated in such a mixture and the leaves subsequently exhausted by another addition of rectified spirit, and it were then evaporated to an extract, and then the pyroxilin and other materials were dissolved in the liquid which first came through, he thought it would be a most efficacious method of making the compound in question. He had a series of stone percolators, with glass tubes and clips in the bottom, and percolating through a series of six he found very little further evaporation was required. If properly dried belladonna leaves were treated in this way he believed nine-tenths of the alkaloid present would be extracted.

Mr. **Wrenn** thought this paper ought to receive the most careful attention of every pharmacist. The only way to prevent the spread of American perforated plasters would be the use of fluid plaster. There were two things to be considered, the convenience of the patient and the efficacy of the medicament, and from the former point of view he thought it was imperative to omit rather than add anything which did not exist in atropa belladonna. Canada balsam and castor oil should, in his opinion, not be added. He made his liquid belladonna plaster, he must admit, from the green alcoholic extract, in which there was a great waste of the alkaloid obtained, and he would suggest the advisability of taking the succus belladonnæ as the basis of operations. The alkaloid there, with its attendant acid, if carefully evaporated almost to dryness and treated with a mixture of equal parts of alcohol and ether, and the subsequent addition of camphor and pyroxylin, formed one of the most potent and acceptable preparations of belladonna for external use. He should like to ask Mr. Naylor if he had ever made an extract from the fresh belladonna plant, and if so what was the alkaloidal value. He had found that method answer very well.

Mr. **Druce** said he was glad to hear what had been said about the difference between English and foreign dried leaves. This point was drawn to his attention very forcibly some years ago, when a doctor whom he knew, in ordering tincture of belladonna for a child, had to increase the dose up to 2 drachms, and then stopped for fear of alcoholic poisoning rather than atropine. He had been using a German tincture, which was, in fact, practically valueless, and came to him for a *bonâ fide* tincture. This was in November, and as there were some plants growing in the Botanic Gardens, although there had been some sharp frosts, he gathered some leaves, dried them carefully, and did his best to produce a good tincture. He suggested to the doctor that he should begin with a small dose, and he found that five drops were quite sufficient to produce the effect he desired. He thought such preparations should be made with as few evaporations as possible. He should gladly welcome the standardisation of the tincture of belladonna, and thought the alkaloidal strength might be fixed at ·025.

Mr. **Conroy** said when he criticised the formula some time ago he went very fully into the matter, and in a letter to the *Pharmaceutical Journal*, Mr. Linford recommended the use of ammonia in making the extract to free the alkaloid. He had intended carrying out further experiments on the matter, but had been prevented. During the reading of the papers the idea had occurred to him that it would be still better to make this article after the style of chloroform belladonna, viz., to employ the powdered root, add ammonia to it, dry it so as to free the alkaloid, and then to percolate that with the menstruum necessary for making the collodium. He thought they would get better results on those lines than on any other, and he should certainly prefer the colour of an article so prepared to that of the dark green extract.

Mr. **Ransom** said he was about to have made a similar suggestion to that of Mr. Druce, and thought perhaps this would be a good opportunity for introducing a standardised liquid extract, and such a one could be easily prepared. The alkaloids, atropine and hyoscyamine, although they varied to some extent, were similar in their action, and a standardised preparation of belladonna could be prepared more easily than one of many other drugs. If it could be made in the form of a liquid extract, it would be useful for many other things besides the preparation of collodium. He thought galenical preparations should contain the alkaloids in their natural combination with acids, and not, as had been suggested, that the alkaloid should be first liberated by an alkali. If that course were adopted it would be as well to use a solution of atropine at once. He thought an extract of the strength of about ·5 per cent. could easily be obtained. He was well aware that many foreign leaves were of very inferior quality, and much was offered for sale which was not belladonna leaf at all, although similar in appearance.

Mr. **Bird** expressed the hope that the colour of collodium belladonnæ would not again be changed, since the preparation had now come into fairly general use, and he suggested that future experiments should be conducted with a view to the utilisation of the root.

Mr. **Gerrard** asked if anyone could give any information with regard to the comparative therapeutic value of the plaster and the collodium. In his experience, when the plaster was properly made according to the B.P., it was a very common thing to have it sent back with the complaint that it produced pustular eruptions, dilatation of the pupil, etc. In fact, having to spread a large quantity of belladonna plasters, he had been obliged to reduce the belladonna extract to one half the quantity directed, otherwise the complaint was made that blisters were sent instead of belladonna plasters. The extract as commonly supplied was by no means satisfactory. In the B.P. process water was used for displacement, and the result was that a watery extract got into the alcoholic extract, and he should, therefore, like to see the process altered. On the question of the extracts obtained by Messrs. Wright and Naylor respectively, did they not obtain two distinct kinds of extract? On allowing them to stand he believed it would be found in each case that there was an upper layer of a lighter colour, and a heavier layer of a brown colour, in the case of the leaf, with a considerable amount of green fatty chlorophyll. The question was, were they able to get both the green and brown extracts in solution? He felt inclined to favour Mr. Linford's idea of liberating the alkaloid with ammonia. It was easily done, and was an admirable method of extracting alkaloids and getting them into solution. He could not see that the question of natural acid was of much importance; malic acid was a weak organic acid, with no greater therapeutic effect than could be obtained by citric or tartaric acid. Anything which could take the place of the nasty, disagreeable belladonna plaster to which they were accustomed would be an advance

Mr. **Lake** said, it being admitted that the activity of the belladonna plaster was dependent on the alkaloid, it appeared to him that it would simplify matters if a solution of the alkaloid were adopted, of a strength to be decided upon after various experiments. It seemed doubtful whether the natural acid was of any real service in the preparation.

Mr. **Wright** said he considered that a preparation of a drug, whether belladonna or any other, should represent the drug itself; an alkaloid was a definite thing, and you might have a preparation of it, but if you wanted to prepare an extract or a tincture, it should represent the drug in its entirety, with the alkaloids in the same state of combination in which they existed in the drug. Mr. Gerrard and others had alluded to the fact of malic acid being a very weak acid, and to the difficulty of understanding how the combination between atropine and malic acid could affect the properties of the compound to any considerable extent. On such a subject he should not like to pose as an authority, but he thought the evidence was rather in favour of such an influence. It was difficult to say what changes took place when a drug was administered, either internally or externally, and it was rather begging the question to assert that even a weak acid in combination might not affect the action of the alkaloid itself. One or two points in connection with Mr. Naylor's paper he should like a little further information upon. In one place Mr. Naylor referred to using the drug in No. 20 powder, further on in No. 60 powder, and yet further the process of evolution had gone on, until he was bold enough to speak of using the drug in fine powder. In order to extract a drug with strong alcohol, the finer the powder the better, there need be no fear of clogging in the percolation. He quite admitted that in the preparation of a fluid extract from belladonna leaves it was a great advantage to carry the process of exhaustion to the furthest possible limit, and in the process he had described he admitted that that was not done, but one could in that way get a much stronger extract than Mr. Naylor stated. He had no difficulty in getting from English leaves an extract of from ·6 to ·8 per cent. by direct percolation. Mr. Naylor used ether to dilute the liquid extract, with the result that a deposit was thrown down, carrying with it apparently one-twelfth the total quantity of alkaloid. It appeared as if they had reversed the operations. He (Mr. Wright) left some alkaloid behind in the drug; Mr. Naylor took it out, but afterwards added ether, which partially removed it. He should not like to say that his collodium belladonnæ would come up to the standard of ·47 of alkaloid, but it was very easy to prepare one by his process which should contain from ·3 to ·4 per cent. Although alcohol was a good solvent of the active principles of belladonna leaves in the state of combination in which they existed in the drug, ether was not, and he had noticed when adding ether to the fluid extract that there was a crystalline deposit, which he had not yet had time to examine, but should not be surprised to find it to contain atropine or hyoscyamine. He saw no advantage in preparing this article from a dry extract prepared from the succus, and it might be difficult to dissolve an extract prepared from the succus in alcohol without having a subsequent deposit of the active principle. At any rate, as this preparation had made its reputation on the strength of specimens prepared from the leaves, the leaf was the right thing to use. The point mentioned by Mr. Gerrard was very important, and he could corroborate his statement. Over and over again, since the alcoholic extract of the root had been introduced into the Pharmacopœia for the preparation of the plaster, he had heard complaints of patients being blistered.

Mr. **Naylor** said he perfectly agreed with Mr. Wright that it was scarcely their busines to discuss whether the alkaloid represented the physiological action of belladonna in its entirety or whether the addition of the natural acid made any difference to its action. The question he put to himself was this, what was demanded? and the answer was, a galencial preparation; and on examination of that preparation the alkaloid was not found present in the free condition. It was simplicity itself, as the President had said, to dissolve a certain amount of alkaloid in collodium, and if a medical man desired to use such a preparation any chemist in the room would be glad to dispense it. In reference to Mr. Wright's observations, he should like to say that the experiments which he had summarised in the paper had been carried on for a long time, and he had made a selection from a large number of notes, choosing those which he thought would best answer the purpose they both had in view, viz., the production of a better formula than the existing one for liquid belladonna plaster. That partly accounted for the circumstances that powder of different strengths had been used. As to the strength of the preparation, he thought Mr. Wright had slightly discounted his statements, but he would yield to him if by his process he could show as good results as he (Mr. Naylor) had placed on record in this paper. Further, it would be desirable to adopt Mr. Wright's process if it could be shown that the methods hitherto proposed gave a preparation which was really too powerful for medicinal application. He was much obliged to the gentlemen who had taken part in the discussion. The members of the Committee desired so to amend the formula as to give entire satisfaction, and they could only do this by the assistance of members.

The Conference then adjourned for luncheon.

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## THE ALKALOIDAL TINCTURES OF THE BRITISH PHARMACOPŒIA.—SUGGESTIONS FOR THEIR STANDARDISATION.

BY E. H. FARR AND R. WRIGHT,

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During the past three years we have been engaged upon a research having the following objects in view:—

1. To ascertain whether the alcoholic strength of the official menstrua for the preparation of tinctures of drugs containing alkaloids are in all cases the most suitable.

2. To devise accurate and reliable methods for the estimation of the alkaloids.

3. To find the average alkaloidal strength of tinctures prepared from genuine drugs.

4. To test the comparative value of several alternative processes for the preparation of the tinctures.

The work done upon the above subjects has already been published; the principal results obtained are summarised in the table below.

The results recorded in the table show that tinctures prepared from carefully selected drugs vary considerably in strength, and it is to be inferred that commercial tinctures would indicate a much greater variation. This disparity in alkaloidal strength must necessarily give rise to a corresponding lack of uniformity in therapeutic effect, constituting a source of disappointment to the prescriber and, in many instances, of danger to the patient.

*Table I.*

| Tincture. | Official Menstruum. | Proposed Menstruum. | Percentage of Alkaloid in Tinctures. | Average Percentage of Alkaloid in Tinctures. | Process Recommended for Tincture. |
|---|---|---|---|---|---|
| Aconite ............... | 90 p. c. | 70 p. c. | ·045 to ·086 | ·062 | Percolation. |
| Belladonna............ | 57 p. c. | 50 p. c. | ·015 to ·045 | ·028 | Macero-percolation or percolation. |
| Cinchona ............ | 57 p. c. | 70 p. c. | ·76 to 1·50 | 1·0 | Macero-percolation or percolation. |
| Colchicum ............ | 57 p c. | 50 p. c. | ·064 to ·119 | ·085 | Percolation. |
| Conium .............. | 57 p. c. | 70 p. c. | ·06 to ·16 | ·086 | Percolation. |
| Gelsemium............ | 57 p. c. | 60 p. c. | ·020 to ·076 | ·044 | Percolation. |
| Hyoscyamus ......... | 57 p. c. | 50 p. c. | ·008 to ·015 | ·010 | Macero-percolation or percolation. |
| Jaborandi ............ | 57 p. c. | 50 p. c. | ·046 to ·152 | ·105 | Percolation. |
| Lobelia .............. | 57 p. c. | 50 p. c. | ·028 to ·044 | ·038 | Percolation. |
| Opium ................ | 57 p. c. | 30 p. c. | — | — | Maceration. |
| *Stramonium ......... | 57 p. c. | 50 p. c. | ·020 to ·034 | ·026 | Macero-percolation or percolation |
| Veratrum viride...... | 90 p. c. | 70 p. c. | ·032 to ·220 | ·138 | Percolation. |

* Recommended to be prepared from the leaves.

The question arises as to whether nothing can be done to produce tinctures of definite strength; and it is a question to which, as practical pharmacists, we may reasonably be expected to furnish a reply. If a demand were made on the part of the medical profession for galenical preparations absolutely uniform in composition, such a demand would undoubtedly be met, on the part of pharmacists, with a "non possumus."

Such a demand has not hitherto been made, and is not likely to be made in the future, for where scientific precision is required, the alkaloids, or solutions containing them, will be employed.

On the other hand, when a physician prescribes a galenical preparation of a powerful drug it may be supposed that he wishes to administer to his patient all the active principles of the drug in the state of combination in which they exist in the drug itself; while it remains with the pharmacist to see to it that the preparation placed in the hands of the medical man is as nearly constant in strength as the art of pharmacy can make it.

In the case of galenical preparations of many drugs it is manifestly impossible to set up standards of any description, either because their precise active principles are not known—do not possess well-defined chemical and physical characters—or do not lend themselves readily to isolation in a state of purity. With preparations of drugs containing alkaloids the case is different. The therapeutic effect of these drugs is admittedly due to their alkaloidal principles, and any move in the direction of the standardisation of their galenical preparations must evidently take the form of the setting up of some standard for one or more of the alkaloids present.

The principle upon which this standardisation should be carried out appears to us to be that where any one alkaloid has been shown to be of supreme physiological importance, and is capable of ready isolation and estimation, the proportion of such alkaloid present should decide the question of the standard; but where the activity of the drug is due, not to one alkaloid chiefly or entirely, but to the indefinite mixture of alkaloids, then the strength of the preparation should be regulated according to the percentage of total alkaloids.

The cases in which one alkaloid is of cardinal importance are rare. Probably morphine may be instanced as the principal constituent of opium, although the researches of Dott and Stockman have shown that the action of the other opium alkaloids more closely resemble that of morphine than has been commonly supposed ('Year-Book of Pharmacy,' 1891, p. 242 to 244).

Another case in point is that of the aconite alkaloids, where the masterly work of Professor Dunstan and his co-workers in the Research Laboratory has clearly established the fact that the toxic effect of the plant *Aconitum Napellus* is due to the crystalline alkaloid, aconitine.

But apart from these instances there is nothing to show that the tinctures of other alkaloidal drugs included in the British Pharmacopœia may not reasonably be standardised according to the amount of total alkaloid present.

The question next arises as to how standardisation on the above lines is to be carried out.

It might appear at first sight as if all reasonable requirements would be met by the employment of standardised drugs; the responsibility being thrown upon the pharmacist of producing therefrom preparations as uniform in character as possible.

Altogether apart, however, from the difficulty experienced in obtaining drugs of a definite degree of alkaloidal content, it will be seen on reference to our notes on cinchona and opium ('Year-Book of Pharmacy,' 1891, p. 497, and the *Chemist and Druggist*, vol. xlii., p. 78) that the employment of standardised drugs does not ensure uniformity in the strength of the resulting tincture.

An alternative method consists in the production of a standard extract, and its utilisation for the other galenical preparations of the drug.

This is the official method for tincture of nux vomica, and a similar plan has been proposed by Dunstan and Ransom (*Pharm. Journ.*, [3], vol. xvii., p. 843), and also by Barclay (*Pharm. Journ.*, [3], vol. xxiii., p. 740), for the production of preparations of belladonna.

There are, however, objections to a process such as this.

In the first place, the preparation of the extract involves the exposure to heat of those constituents of the drug which are most susceptible to change. In the case of nux vomica, the extract is so far affected that it is never entirely soluble in alcohol of the same strength as that with which it was originally prepared; while the resulting tincture is not only darker in colour than one of equal strength prepared without heat, but is also apt to throw down an unsightly deposit.

The dictum that a tincture should contain the active principles in the exact condition in which they exist in the drug itself demands that the application of heat in its production be avoided if possible. Another objection to the preparation of tinctures from extracts is that very few extracts remain in the same condition for any length of time. Those containing deliquescent mineral salts will absorb moisture, others become hard and dry; and in the latter case one does not always find it the easiest matter in the world to obey the official injunction to "dissolve the extract in the spirit." Another, and very practical objection, is, that the conversion of a tincture into extract, followed by the re-conversion of the extract into tincture, involves a needless waste of time.

Such considerations as these have led us to the conclusion that the most feasible plan for the production of tinctures of constant strength consists in the preparation of a strong tincture by percolation, and its subsequent dilution to the required standard.

By such a plan as this the employment of heat is avoided, the natural combinations of the drug are preserved, and the active principles are distributed through such a volume of liquid as may be relied upon to ensure the stability and permanence of the resulting preparation. Preliminary experiments were next undertaken in order to ascertain how far it would be necessary to carry percolation in order to secure the practical exhaustion of each individual drug.

For this purpose 100 grammes of the drug, in powder of the requisite degree of fineness, was moistened with menstruum, packed in a conical percolator, more menstruum was then added, and percolation allowed to proceed. The percolate was collected in fractions of 100 c.c., and the amount of alkaloid and extract in each fraction was estimated by the processes described in the series of notes on tinctures already published by us.

The results obtained are shown in Table II.

From the results shown in the table it will be seen that a large proportion of the alkaloid is found in the first fraction of the percolate.

In the case of cinchona the alkaloid present in this fraction amounts to 47 per cent. of the whole; in the leaf tinctures from 60 to 66 per cent., in conium and veratrum about 70 per cent., while the first fraction collected from aconite, colchicum, and nux vomica actually contained 80 per cent. of the alkaloid present in the drug operated upon.

A further inference to be drawn from the results given in the table is that the practical exhaustion of such drugs as aconite, colchicum, and nux vomica may be effected by the employment of drug and menstruum in the proportion of 1 to 3, that of conium and veratrum in the proportion of 1 to 4; and that in no case would it be necessary to carry percolation beyond 15 fluid ounces in order to exhaust the quantity of drug representing a pint of tincture.

The process we have followed in order to produce a standardised tincture has been to take the amount of drug ordered in the Pharmacopœia for a pint of tincture, moisten with menstruum, pack in a conical percolator, add more menstruum, and allow percolation to proceed until 10, 12, or 15 fluid ounces percolate has been collected. The marc is expressed, and the expressed liquid added to the percolate, which is then assayed, and a sufficient volume of menstruum added to dilute the tincture to the required standard.

The volume of percolate to be collected in each case, together with the alkaloidal standards proposed, are shown in Table III.

*Table III.*

Showing results obtained in preparing standard tinctures.

| Tinctura. | Volume of percolate collected. | Percentage of alkaloid in percolate. | Proposed standard per cent. | Percentage of extract in finished tincture. |
|---|---|---|---|---|
| Belladonna... | 12 fl. ozs. | ·068 | ·025 | 1·0 |
| Cinchona ... | 15 fl. ozs. | 1·27 | 1·0 | 6·28 |
| Colchicum... | 10 fl. ozs. | ·156 | ·075 | 2·04 |
| Conium ...... | 10 fl. ozs. | ·520 | ·25 | 1·66 |
| Gelsemium... | 12 fl. ozs. | ·056 | ·025 | 1·26 |
| Hyoscyamus. | 12 fl. ozs. | ·012 | ·010 | 4·14 |
| Jaborandi ... | 12 fl. ozs. | 1·24 | 1·0 | 3·78 |
| Lobelia ...... | 15 fl. ozs. | ·052 | ·025 | 1·08 |
| Nux Vomica. | 12 fl. ozs. | ·360 | ·250 | 1·24 |
| Stramonium. | 12 fl. ozs. | ·037 | ·025 | 1·48 |
| Veratrum Viride ... | 15 fl. ozs. | ·160 | ·1 | 3·40 |

Note 1. The standard proposed for tincture of conium is equivalent to ·2 per cent. conine.

Note 2. The tincture of stramonium is made from the leaves.

The results of experiments on the exhaustion of aconite root are given in Table II., but we are not in a

*Table II.—Showing Percentage of Alkaloid and Extract yielded by Fractions of Percolate from different Drugs.*

| Tincture. | Alkaloid. | | | | | Extract. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Fraction 1. | Fraction 2. | Fraction 3. | Fraction 4. | Fraction 5. | Fraction 1. | Fraction 2. | Fraction 3. | Fraction 4. | Fraction 5. |
| 1. (*a*) | ·340 | ·105 | ·022 | ·004 | ·002 | — | — | — | — | — |
| (*b*) | ·470 | ·145 | ·026 | ·004 | ·002 | 13·22 | 6 54 | 1 87 | ·82 | ·55 |
| 2. (*a*) | ·490 | ·060 | ·016 | ·006 | ·004 | — | — | — | — | — |
| Aconite (*b*) | ·720 | ·100 | ·020 | ·006 | ·004 | 18·16 | 7·42 | 1·98 | ·71 | ·51 |
| (1) | ·460 | ·050 | ·036 | ·016 | ·004 | 7·90 | 2 16 | 1·11 | ·63 | ·54 |
| Belladonna (2) | ·400 | ·220 | ·088 | ·068 | ·025 | 14·26 | 6·90 | 3·52 | 1·98 | 1·30 |
| (1) | 3·12 | 1·66 | ·60 | ·42 | ·30 | 18·84 | 8·86 | 2·78 | 1·56 | 1·02 |
| Cinchona (2) | 2·91 | 1·68 | 1·04 | ·56 | ·34 | 17·48 | 9·52 | 5·40 | 2·54 | 1·56 |
| (1) | ·580 | ·175 | ·034 | ·012 | ·004 | 13·46 | 1·34 | ·58 | ·30 | ·14 |
| Colchicum (2) | ·505 | ·030 | ·005 | ·004 | nil | 17·10 | 7·52 | ·88 | ·62 | ·42 |
| (1) | ·650 | ·135 | ·038 | ·024 | ·016 | 15·76 | 5·90 | 1·86 | ·70 | ·42 |
| Conium (2) | 1·373 | ·351 | ·074 | ·039 | — | 7 32 | 3·76 | 1·32 | ·81 | ·61 |
| (1) | ·112 | ·048 | ·022 | ·022 | ·018 | 7 91 | 1·18 | ·34 | ·28 | ·26 |
| Gelsemium (2) | ·280 | ·052 | ·016 | ·006 | ·003 | 13·28 | 2·08 | ·38 | ·20 | ·16 |
| (1) | ·064 | ·024 | ·010 | ·004 | ·001 | 16·72 | 8 46 | 3·54 | 1·26 | ·86 |
| Hyoscyamus (2) | ·038 | ·014 | ·008 | ·004 | ·002 | 11·80 | 6·84 | 3·70 | 2·14 | 1·24 |
| (1) | ·320 | ·140 | ·006 | ·002 | ·001 | 17·10 | 7·52 | ·88 | ·62 | ·42 |
| Jaborandi (2) | ·400 | ·205 | ·066 | ·016 | ·011 | 14 84 | 8 38 | 2·46 | ·82 | ·50 |
| (1) | ·180 | ·050 | ·016 | ·010 | ·004 | 11·08 | 2·94 | 1·10 | ·60 | ·36 |
| Lobelia (2) | ·152 | ·052 | ·022 | ·010 | ·004 | 8·70 | 3·80 | 1·68 | ·80 | ·44 |
| (1) | 1·825 | ·336 | ·044 | ·020 | ·014 | 13·98 | 2·12 | ·44 | ·22 | ·16 |
| Nux vomica (2) | ·850 | ·172 | ·050 | ·019 | ·006 | 5·92 | 1·14 | ·39 | ·21 | ·13 |
| (1) Seeds | ·180 | ·028 | ·020 | ·020 | ·008 | 3·50 | ·70 | ·44 | ·34 | ·32 |
| Stramonium (2) Leaves | ·180 | ·060 | ·036 | ·016 | ·008 | 9·90 | 3·74 | 2·34 | 1·22 | ·64 |
| (1) | ·450 | ·150 | ·040 | ·032 | ·008 | 4 80 | 1·26 | ·50 | ·48 | ·40 |
| Veratrum viride (2) | ·550 | ·130 | ·028 | ·008 | ·004 | 12·36 | 5·18 | 1·30 | ·44 | ·32 |

*Note.*—1. The figures for the aconite alkaloid represent (1) ether soluble, and (2) total alkaloid.
2. The conium alkaloids were weighed as hydrochlorates.

position to make any proposal for the standardisation of the tincture. For the production of standardised tincture of opium the following process is proposed:—

Take of—

| | |
|---|---|
| Moist opium in slices | 2 ounces. |
| Distilled water | 14 fluid ounces. |
| Rectified spirit | 7 fluid ounces. |

Rub the opium with the distilled water until it is thoroughly disintegrated, macerate for six hours, add the rectified spirit and macerate for seven days, strain and press, adding the pressings to the strained tincture, and filter. The percentage of morphine is estimated by a modification of the B.P. process for the assay of opium (*Chemist and Druggist*, vol. xlii., p. 77), and a sufficient quantity of a mixture of one measure rectified spirit and two measures water is then added to reduce the amount of morphine in the tincture to ·75 per cent.

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The PRESIDENT said all must appreciate the value of this most important paper, and the remark with reference to nux vomica was especially to the point. The tincture made according to the present B.P. process had a peculiar burnt flavour and odour, owing no doubt to the method of drying, instead of percolating direct from the drug.

Mr. GERRARD said he had had some experience of the action of heat on alkaloidal matter. If you took a solution of atropine and boiled it even with alcohol it lost 50 per cent. of its alkaloidal power in about ten minutes. It seemed to be converted into a new body containing, with the old alkaloid, atropa and atropine. It was very easily done, though it was, perhaps, not generally known. Strychnine was not so easy to decompose as atropine, still, the same thing applied, he believed, to all alkaloids, and therefore the use of heat should be avoided as far as possible. He should like to know if the authors had any information as to how long these tinctures would maintain their standard strength, because if they changed materially it would give rise to a great deal of annoyance. If a pharmacist were called upon to produce tinctures of a certain standard and found that after being on his shelves for twelve months they had lost 10 or 15 per cent. of alkaloid, or even more, and the public analyst came down upon him, it would be very unfortunate.

Mr. CONROY said the work done by the authors of this paper was truly gigantic. He had studied all their papers on this subject with very great interest, and he must add that he had learned a good deal from them. He could endorse what had been said by Mr. Wright about preparations from standardised drugs and extracts, and considered it was a retrograde step. He said, when Messrs. Dunstan and Short brought forward their formula for the preparation of tincture of nux vomica, that it was a mistake; you did not get as nice a preparation, and it had an unpleasant burnt odour and taste. The standardised opium of the Pharmacopœia was also a retrograde step, and he thought the standard of opium should be raised. He thought the plan usually adopted by makers on a large scale was that mentioned by Mr. Wright; they standardised the tincture and made it up to the correct strength. That was the best way of getting the right strength.

Mr. WRIGHT, in reply, said Mr. Gerrard's suggestion had not been lost sight of. Care had been taken to preserve specimens of each batch of tinctures made, which were put by, and as soon as they had time they hoped to settle the question of permanence. These tinctures had been already kept in stock two or three years, and a further report would be made later on. He was grateful to Mr. Conroy for his remarks, especially considering his great experience in the matter. He would emphasise his remarks on the subject of the inadvisability of producing tincture of nux vomica from the extract. This was one of the extracts which became very hard and dry, and it was often reported to him by those entrusted with the operation that they could not get the extract to dissolve in the spirit. It had occurred to him whether this might not be a case similar to that which occurred in making tincture of opium by the B.P. process, and whether if the extract were not entirely dissolved it was certain that all the alkaloid was dissolved. There would be one advantage in fixing a standard for these tinctures which ought not to be lost sight of; it would to a certain extent clear them from what he conceived to be a danger in the production of pharmaceutical tinctures, that the drug might not always be obtained from the proper source. He remembered a case of tincture of jaborandi which did not contain one-fourth the alkaloid it ought to have done. Immediately afterwards he read a paper by Mr. Holmes on the advantage of fixing the geographical source of many of the drugs in the Pharmacopœia, and he mentioned specially *Pilocarpus selloanus*, the leaves of which he said did not contain nearly as much alkaloid as the official jaborandi. Again, in the case of conium he had met with a specimen in which the quantity of alkaloid was so small that it could scarcely be estimated, though judging by the colour, and other characters, one would have said that it was a splendid sample of hemlock fruit.

(*To be continued.*)

## Parliamentary and Law Proceedings.

### The Sale of Patent Medicines.

In the House of Commons, on Monday, Mr. F. C. Frye asked the Secretary to the Treasury, it having been stated by the Parliamentary Committee of the British Medical Association in their recent report on the sale of patent medicines that the further action of the Public Prosecutor in respect of actions taken by him had been limited by the directions given to the officers of the Treasury by the Attorney-General—first, to prosecute only in the event of a particular preparation being really poisonous or dangerous on the ground of poisonous ingredients; and, secondly, that the mere presence of a poisonous ingredient, if not in sufficient quantity to make the article sold poisonous, would not justify proceedings under the 17th section of the Act, whether the Pharmaceutical Society was justified, in face of this restriction, in continuing to demand penalties from tradesmen throughout the kingdom; and if so, on what grounds.

Sir J. Hibbert: The directions given by the late Attorney-General to the department of the Solicitor to the Treasury are correctly quoted, and they have been, and are still, acted upon by the Director of Public Prosecutions; but I am not prepared to give a legal opinion on the action to be taken by the Pharmaceutical Society in the exercise of its discretion, or in accordance with the advice of its own legal advisers.—*Times*.

### Sale of Poisonous Skin Specifics.

On Thursday, August 17, Madame Anna Ruppert, who has an establishment at 74, Grafton Street, Dublin, was charged at the Southern Police Court in that city, by the Pharmaceutical Society of Ireland, with selling a certain skin specific alleged to contain poison, and with not being duly licensed under the Pharmacy Act.

Mr. Walters, Inspector for the Society, proved that on June 8 he purchased at the shop, 74, Grafton Street, over the door of which was the name of Anna Ruppert, a bottle of "Ruppert's Skin Tonic." A book, which he got in the place, said the preparation was guaranteed harmless, and contained nothing injurious to the skin. He sent the preparation to Professor Tichborne for analysis.

Professor Tichborne deposed that he had analysed the bottle, which contained about eight grains of corrosive sublimate in solution. There were two cases recorded in Taylor's work on 'Medical Jurisprudence' in which death was recorded by a dose of five grains. The preparation was an old remedy for removing freckles, and should be used with great caution and strictly under medical supervision.

Mr. Farrell produced the registers of chemists and druggists. The name of Anna Ruppert, 74, Grafton Street, did not appear on any of them.

Professor Tichborne, in reply to Mr. Collins, said the ingredients in the bottle labelled "Ruppert's Skin Tonic" were worth about a halfpenny.

Mr. Collins: And the price to the public is 10*s.* 6*d.*

Mr. Ennis submitted that there was no legal proof of the sale of this particular bottle.

Mr. Byrne imposed a fine of £5 and costs.—*Daily Telegraph.*

## Correspondence.

### The Preparation of Ozone.

Sir,—The proportion of ozone obtained by Mr. Priest and myself was about 17 per cent., not 30 per cent., as stated in your issue of July 29. Professor McLeod obtained a slightly greater proportion than this a few years ago by an electrolytic method; whilst Brodie, still earlier, found that the oxygen formed by the action of the silent discharge on carbon dioxide contained as much as 85 per cent. of ozone. It will thus be seen that the yield of ozone obtained by Andreoli's method is by no means high. In fact, it amounts to little more than 1 per cent. of the total volume of the air ozonised. Probably, however, in a manufacturing process the point of importance is not so much the producing of air very rich in ozone as the producing of a considerable total amount of ozone at a low cost. May I further point out that the difficulty of obtaining air rich in ozone cannot be in any way due to the "extraordinary diffusive" power of this form of oxygen? So dense a gas as ozone must have a comparatively low rate of diffusion, and, in fact, Saret has shown that this is undoubtedly the case. As a remedial agent ozone should be accepted with caution, as it is highly corrosive to many forms of organic matter, and except in traces is an irritant to the mucus membrane.

*Clifton College.* W. A. Shenstone.

### Territorial Representation.

Sir,—The letters on the above subject which appeared in the Journal for August 12 show different shades of opinion, such as must necessarily exist on every important question, but Mr. Alexander Bottle's letter will be readily endorsed by many, and will appeal to the reason of all, for while everyone must regret the almost total want of sympathy with the work of the Society by the trade in general, county representatives are not likely to be any improvement on the present system, composed as it is of men who take a real interest in the whole body of chemists. The Pharmaceutical Society must wait until the tradesmen of the old school have passed away before it can be properly appreciated, in the meantime let it continue to cultivate and watch over the interests of its younger members, and the coming generations of pharmacists will belong to a Society of which they will be justly proud.

*Clifton.* Franklin Chalmers.

*A. Wilson.*—You will find several papers by Dr. Phipson in back numbers of the *Chemical News*. Refer to the Pharmaceutical Society's library catalogue for names of works on the subject.

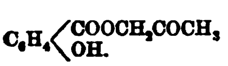
*W. Puckey.*—See article on the subject in the 'Extra Pharmacopœia,' where several references are given. Also see *Pharm. Journ.*, [3], xx., 227.

*F. W. Daniels.*—Your letter should have been addressed to the advertisement agents. See notice at head of page 165.

Communications, Letters, etc., received from Messrs. Davis, Elborne, Featherstone, Gordon, Lake, Ransom.

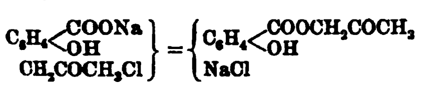
## "THE MONTH."

**Salacetol.** This substance, obtained by Dr. P. Fritsch (see last volume, p. 888), and introduced into commerce by Messrs. Hofmann and Schoetensack, of Ludwigshafen, is described as an artificial glucoside of salicylic acid, and is intended to replace salol and sodium salicylate in medicine, especially to overcome the objection to the use of salol arising from the liberation of phenol in the organism, which is, in some instances, attended with symptoms of poisoning. The composition of salacetol is represented by the formula:—



$$C_6H_4\langle\begin{smallmatrix}COOCH_2COCH_3\\OH.\end{smallmatrix}$$

and it contains a salicylic acid residue combined with acetone, alcohol, acetol, or acetyl carbinol, $CH_3{\cdot}CO{\cdot}CH_2OH$. It is prepared by heating a mixture of monochloracetone and sodium salicylate, the reaction taking place being shown by the equation:—



$$\left.\begin{matrix}C_6H_4\langle\begin{smallmatrix}COONa\\OH\end{smallmatrix}\\CH_2COCH_2Cl\end{matrix}\right\}=\left\{\begin{matrix}C_6H_4\langle\begin{smallmatrix}COOCH_2COCH_3\\OH\end{smallmatrix}\\NaCl\end{matrix}\right.$$

Salacetol crystallises from alcohol in fine brilliant needles, and from petroleum spirit in scales. It has a slight bitter taste, is sparingly soluble in cold water, more so in hot, sparingly soluble in cold alcohol, but copiously soluble in hot alcohol, ether, carbon bisulphide, chloroform, benzene, and petroleum spirit. The melting point is 71° C. Professor Bourget, of Lausanne, finds that salacetol is broken up in the organism within half an hour of its administration, salicylic acid being then found in the urine. The mode of administration appears to have some influence in this respect, and, as in the case of salol, more salicylic acid passes into the urine when it is given with castor oil than when given in powder. Bourget has used salacetol with advantage in cases of incipient diarrhœa, two or three grammes being given with thirty of castor oil early in the morning while fasting, and if necessary this dose may be repeated for two or three days. Half a gramme daily may be given to a child of one year without inconvenience (*Pharm. Zeitung*, xxxviii., 496).

**Absolute Alcohol.** Dr. E. R. Squibb has performed fresh work on the dehydration of alcohol, and reviewed his former labours with different methods and some improvements in apparatus. Premising that specific gravity was the sole indication of strength to be relied on, special care was devoted to effecting improvements in apparatus so as to ensure it being accurate and highly sensitive. To this end the author devised an improvement of the specific gravity bottle he designed some years ago upon the plan of a thermometer. This is described and illustrated. It was confidently expected that more perfect dehydration might be obtained by often repeated percolation through lime than by prolonged shaking with the same compound. The results proved conclusively, however, that no part of the distillate obtained subsequently was anhydrous alcohol. The original alcohol used had a specific gravity of 0·793824, at 15°·6 C., it was believed to be quite free from all impurities except water, and, of this, to contain only about 0·1 per cent. Distilled water giving a dilution of almost exactly 0·2 per cent. was added, bringing the specific gravity to 0·794500, and the mixture was passed through a lime percolator twenty-five times in six days. It was ultimately found that about 0·16 per cent. of the added water was removed by the lime, leaving about 0·04 per cent. remaining in the alcohol. The lightest distillate obtained was 0·79392, and the average 0·793954. Dehydration by metallic sodium gave still less satisfactory results, the lightest fraction distilled being 0·793713, and the average not below the original 0·793824. Lower figures were obtained by distillation of the original alcohol with specially prepared quicklime, but Dr. Squibb concludes by expressing the opinion that up to the present time no really anhydrous alcohol has been obtained (*Journ. Am. Chem. Soc.*, xv., 126).

**Pyroxylin.** W. D. Field states that such is the influence of the physical form of the fibre used for the production of pyroxylin on the process of nitration that, when flax and cotton are treated with acid mixtures of exactly the same strength and at the same temperature, the solution of the first is glutinous or thick and the second fluid or thin. By simply nitrating the flax at a higher temperature than the cotton, it will yield a pyroxylin giving an equally fluid collodion. The presence of chlorine in the fibre results in the production of an acid pyroxylin which cannot be neutralised by washing, and the absence of moisture previous to nitration is essential to the production of a carefully prepared pyroxylin (*Journ. Am. Chem. Soc.*, xv., 140).

**Chromium Tungstate.** E. F. Smith and H. L. Dieck have prepared this compound in a crystalline form by fusing together potassium bichromate and an equivalent amount of pure tungstic oxide. It occurred as acicular, brown coloured crystals of orthorhombic outline, associated with green coloured crystals of the same crystallographic system. The latter were removed on treatment with aqua regia, leaving the brown crystals unaltered (*Journ. Am. Chem. Soc.*. xv., 151).

**Cuprous Phosphide.** A. Granger has been able to prepare this compound in a crystalline state and free from metallic copper, by the action of phosphorus upon a cupric salt. The formula of the salt is $Cu_3P_2$. It occurs as a grey crystalline powder, having somewhat the appearance of plumbago, and is attacked in the cold by chlorine and bromine, whilst dilute nitric acid dissolves it readily. Mixed with potassium nitrate or chlorate it detonates when struck, and heated in contact with air it becomes oxidised to copper phosphate. At a red heat it decomposes in a similar way to cupric phosphide (see *Comp. rend.*, cxiii., 1041). The cuprous compound is freely soluble in hydrochloric acid, and the solution gives a precipitate of oxide of copper with potash, whilst, when supersaturated with ammonia, it decomposes ammoniated argentic nitrate to metallic silver (*Comp. rend.*, cxvii., 231).

**Hydrocyanic Acid from Sugar.** F. B. Burls, whilst preparing oxalic acid from cane-sugar, by oxidation with nitric acid, noticed the formation of hydrocyanic acid, and subsequent experiments showed that it was formed in perceptible quantities during the reaction. The acid appears to be a normal product of the reducing action of carbon and certain carbon compounds upon nitric or nitrous acid, and the reaction may be expressed as follows :—

$$\begin{aligned} 2HNO_3 + C &= 2HNO_2 + CO_2 \\ HNO_2 + 2C &= HCN + CO_2 \end{aligned}$$

(*Chem. News*, lxviii., 75).

**Pure Phosphoric Acid.** H. N. Warren suggests a method for preparing phosphoric acid in a pure state, which consists in introducing sodium or other soluble phosphate into a solution of copper sulphate; washing the insoluble copper phosphate formed, and dissolving in solution of phosphoric acid; then electrolysing the mixture. A pure and very dense copper is said to be thrown down, and a large quantity of "pharmaceutical" acid of sp. gr. 1·75 obtained in a short space of time (*Chem. News*, lxviii., 66).

**Detection of Eserine.** S. J. F. da Silva describes in detail a new reaction of eserine, which appears to be extremely sensitive, since he claims to be able to detect 0·005 gramme of the alkaloid by its aid. A minute fragment of the alkaloid, or of one of its salts, is placed in a porcelain capsule and dissolved in one or two drops of fuming nitric acid. The clear yellow solution thus obtained, when heated on a water-bath, gradually changes to orange colour, but, on evaporating to dryness, stirring meanwhile with a glass rod, the residue becomes green. This residue is soluble in water, more so in strong alcohol, and also in concentrated sulphuric acid, forming green non-fluorescent solutions, which, on evaporation, leave the substance unaltered in colour. A drop of nitric acid, allowed to fall upon the green residue on the water-bath, causes it to turn blue in places where the acid is not directly in contact with it, and, later, a reddish violet solution is formed, which changes after a while to greenish yellow. This solution, when diluted, is fluorescent, appearing of a blood-red colour by reflected light and greenish yellow by transmitted light. Ammonia does not affect the colour of the green substance, which M. da Silva proposes to name *chloreserine* (*χλῶρος*, green), (*Comp. rend.*, cxvii., 330).

**Citric Acid from Glucose.** C. Wehmer claims to have prepared citric acid by the fermentation of glucose. He states that the acid is a secretion product of certain moulds, being formed in a manner analogous to that by which glucose is transformed into lactic and acetic acids by the action of bacteria. If saccharine solutions be exposed to the action of the moulds sugar is decomposed, carbonic acid being evolved and an organic acid formed, of which the properties and composition are said to be identical with those of citric acid obtained from lemon juice. According to the author this property is possessed by two species of moulds (*moisissures*) or filamentous fungi (*champignons filamenteux*) which have previously escaped observation on account of their resemblance to other, well-known, species. He proposes to term them *Citromycetes*, the two species being distinguished as *pfefferianus* and *glaber* respectively. They are described as forming felt-like green tissues, about half a centimetre thick, on the surface of suitable solutions, and as greatly resembling *Penicillium*, from which they are distinguished with difficulty. Various saccharine fluids, fruits, etc., favour their development, but solutions of glucose constitute the most suitable media. Under proper conditions as to temperature, aeration, etc., it is claimed that citric acid is formed to the extent of more than fifty per cent. of the glucose employed. Eleven kilos. of the sugar yielded six kilos. of pure citric acid in one experiment, without any secondary organic products being formed. The process has been patented (*Comp. rend.*, cxvii., 332).

**Mercury Gallates.** Brousse and Gay have prepared mercurous gallate by precipitating a solution of mercurous nitrate with gallic acid, and mercuric gallate by the action of gallic acid upon mercuric acetate. The mercurous gallate is a yellowish green powder which becomes more distinctly green on desiccation, whilst the mercuric salt is red at first but becomes brown when dry. A more exact method of preparing the former, yielding a more stable compound, consists in triturating crystallised gallic acid, 37·60 grammes, with yellow mercuric oxide, 21·60 grammes, and adding 25 c.c. of distilled water to make a pasty mass. This is left in the mortar for two days, after which it is reduced to powder and subsequently desiccated by exposure for twenty-four hours over sulphuric acid. The resulting product should be of a dark green colour, and is said to contain the equivalent of 37·17 per cent. of metallic mercury when properly prepared. As thus made the salt has been used in cases of syphilis, being given in the form of pills, made by combining it with twice its weight of extract of cinchona. The daily dose administered was from ten to twenty centigrammes (*Comp. rend.*, cxvii., 284).

**Chloro- and Bromo-phenols.** Para-chloro-phenol occurs as crystals, melting at 37° C., boiling at 217°, of a specific gravity 1·306 at 20°·5, and having an odour recalling that of phenol. It dissolves in water (1 to 2 per cent.), alcohol, ether, or alkalies. Ortho-bromo-phenol is a liquid of a dull violet colour, and dissolves in the same liquids as the previous compound, but does not so much resemble phenol in odour. Both compounds have recently been found to yield excellent results in cases of erysipelas when employed in the form of ointment, 1 to 2 per cent. being incorporated with soft paraffin as a basis (*Nouv. rem.*, ix., 353).

**Bismuth Phenates.** On adding a solution of bismuth nitrate to solutions of alkaline phenates, yellow or greyish-brown precipitates are formed, which are insoluble in water and differ in composition according to the phenol used. A combination of tribromo-phenol and bismuth, prepared by the firm of F. v. Heyden, is said to contain fifty per cent. of the former and practically the same amount of bismuth oxide. It is described as a yellow insoluble powder of neutral reaction, without taste or odour, almost non-toxic, and without action upon the lining of the digestive organs. Hueppe considers this preparation to be almost a specific against cholera, destroying the bacilli and effecting a cure without complications. In the case of adults five to seven grammes, administered in half-gramme doses, is said to suffice (*Pharm. Centr.*, 1893, No. 17, 237). Dr. F. Jasenski, of St. Petersburg, has experimented with three similar compounds—phenol-bismuth, cresol-bismuth, and β-naphthol-bismuth—and finds that, when ingested, they are decomposed both by the gastric and pancreatic juices. The phenol, cresol, and part of the naphthol are absorbed and subsequently eliminated by the kidneys in fresh combinations, whilst the remainder of the naphthol and almost the whole of the bismuth are excreted by the bowels. In daily doses of one to three grammes excellent results are said to have been obtained by the use of these compounds in acute and chronic intestinal catarrhs. They were also found of service in cases of cancer of the stomach and in allaying the diarrhœa and colic attending certain maladies, whilst M. Jasenski thinks they should prove valuable in infectious disorders, such as typhoid fever and cholera (*L'union phar.*, xxxiv., 354).

**Emol.** This is the "discretional" name given, after purification, to a natural product found near Dunning, in Perthshire, where it occurs in close association with serpentine marble, chalcedony, onyx, and copper. It was described at the meeting of the British Medical Association by Dr. Jamieson, who read some notes of therapeutic interest concerning the substance. It is allied to fuller's earth, yet is distinct from all the market varieties of that well-known material. Emol contains steatite, and minute traces of lime and oxide of iron are also present. As purified it forms a soft, impalpable powder, having a delicate pink tint. When placed upon the tongue there is no sensation of grittiness as when fuller's earth is similarly tested, and it exerts an immediate softening influence upon the hard water of limestone districts. Used with warm water it is said to act as a natural soap, cleansing the hands and, at the same time, leaving them soft and smooth, whilst the workmen engaged in its preparation found their hands become so soft by contact with it that they were no longer fit for active manual labour. This effect suggested the use of emol for removing horny accretions on the palms and soles. A paste was therefore made with water and thickly applied in certain cases, evaporation of moisture being prevented by covering with an impervious tissue. As a result, the epidermic masses peeled off in layers, leaving the parts treated soft, smooth, and pink in hue. The hard, horny epidermis existing in cases of eczema of the palm and sole was similarly removed. The powder is also described as possessing some antipruritic power (*British Med. Journ.*, 1704, 473).

**Papain.** It is found by Sittman that one centigramme of papain suffices to change ten grammes of coagulated white of egg, mixed with one hundred c.c. of water at a temperature of 40° to 45°, into an opalescent milky fluid in the course of two hours, no free albumin remaining. The action is the same, whether the medium be alkaline or faintly acid. Taken in doses of three to five centigrammes, made into a thin paste, directly after each meal, when the large proportion of albuminous matter was consumed, cessation of pain is said to have been caused in acute gastritis after two or three doses (*Münch. med. Woch.*, xl., 548).

**Cathartic Acid.** An amorphous substance possessing purgative properties and to which this name has been applied has been extracted from senna by A. Gensz, in the laboratory of Professor Dragendorff, at the University of Zuriew (Dorpat). The acid is said to be quite different from principles of variable composition previously known by the same name, and Gensz suggests for it the formula $C_{30}H_{36}NO_{15}$. It is a yellowish-brown powder, slightly soluble in cold water, more freely in warm water, readily in 30 per cent. alcohol, and has a distinctly acid reaction. The adult dose is given as ten to fifteen centigrammes, and the purgative effect is produced in from five to seven hours (*Nouv. rem.*, ix., 368).

**Essential Oil of Hops.** A. C. Chapman, having prepared a quantity of this oil by steam distillation, after an interval of ten or eleven months freed it from resin by twice repeating the process, and then found it commenced to boil at 170°, though the greater part passed over between 230° and 270°. After several fractionations, about 40 c.c. of oil, boiling between 256° and 261°, was obtained, and this was found on examination to be a sesquiterpene. Three combustions gave numbers closely agreeing with those required by the formula $C_{15}H_{24}$, and two vapour density determinations by Hofmann's method gave 6·91 and 7·1 respectively, the latter being that required by the above formula. A freshly distilled sample of oil, examined soon after its preparation, boiled at much lower temperatures, and consisted of terpenes of lower boiling point, together with an oxygenated constituent, but contained very little of the sesquiterpene (*Proc. Chem. Soc.*, 127, 177).

**Steresol.** This is the name given to a preparation recently introduced into therapeutics by Professor Berlioz, of Grenoble. It is an antiseptic varnish for use in diphtheria and several skin diseases, and is said by Dr. Blanc (*Rev. de thérap.*, lx., 407) to consist of equal parts of gum lac, benzoin, and balsam of tolu, dissolved in a sufficiency of alcohol, together with ten per cent. of carbolic acid. Another formula, given in *Les nouveaux remèdes*, is as follows:—purified gum lac, 270 grammes; purified benzoin, 10; balsam of tolu, 10; crystallised phenol, 180; oil of cassia, 6; saccharin, 6; alcohol, sufficient to make one litre.

**Oleocreasote.** This preparation is described as an oleic ether of creasote, obtained by the interaction of oleic acid and creasote, through the influence of dehydrating substances, such as phosphorus trichloride or oxychloride, etc. J. L. Prevost finds that, thus combined, creasote is tolerated in larger doses than when simply mixed with oil, and does not cause gastro-intestinal disturbances. Its toxicity also is much less pronounced than in the latter case (*Rev. méd de la Suisse Rom.*, through *Therap. Gazette*, [3], ix., 533).

**Narcissus Orientalis.** The bulbs of this plant have been chemically examined by L. Robechek and found to contain small quantities of an alkaloid and of a glucoside. The former was obtained in colourless, acicular crystals, and the moist bulbs yielded about one-fiftieth per cent., but the dry drug yielded proportionately less, probably owing to decomposition caused by the heat employed in the process of desiccation (*Am. Journ. Pharm.*, lxv., 369).

**Tannin Cells of the Zingiberaceæ.** J. Barthelat has devoted special attention to the tannin secreting tissues of the Zingiberaceæ, and finds that two distinct types of cells serve this purpose. Thus, in a certain number of species (*Alpinia galanga*, *Hedychium gardnerianum*) the tannin-bearing cells are not specially localised, being simply parenchymatous cells. In the rhizome of *Zingiber officinale*, however, three or four tannin cells are found situated near each large vessel.

They are polygonal in shape, extended longitudinally, and embrace the walls of the vessels in an irregular fashion. In the stem the cells are larger but situated near the fibrovascular bundles; in the leaves they are frequently absent but, if present, are scattered throughout the parenchyma. They are very numerous in the root, where they exist exclusively in the cortical parenchyma, do not differ in form from the surrounding elements, and are always found near the endodermis. In other plants of the order (*Alpinia calcarata*), which are particularly rich in tannin, both systems of the tannin bearing cells are found but, on the other hand, they are wanting entirely in several species of the genus *Curcuma* (*L'union pharm.*, xxxiv., 352).

**Diseases of the Mulberry.** G. Boyer and F. Lambert give a preliminary notice of two new diseases of the mulberry tree, one caused by bacteria and the other by a kind of fungus. The first is most evident in young trees in the nurseries, the micro-organism (*Bacterium Mori*) appearing to check the development of their branches. The attack is manifested externally by the appearance of dark brown patches on the lower surface of the leaves and on the branches, whilst the bacteria are found in the thickness of the tissues which they have destroyed by a process of excavation. The cavities in which the colonies exist are enclosed and limited by the brown coloured cells resulting from the activity of the parasite itself. In the leaves both veins and parenchyma are attacked, and the authors have been able to induce the peculiar stains artificially in these by inoculating them with bacteria taken from diseased branches. The affection caused by the development of the, as yet undetermined, fungus is more common than the preceding, and is the cause of the disappearance of a large number of trees annually in the districts of France devoted to silk culture. It is manifested by the buds and leaves withering and drying up, the outer extremities of the lesser branches being first affected. The mycelia of the parasite appear to infest the wood vessels, and the disease gradually extends to the base of the affected members, thence to the principal branches, trunk, and roots successively. The wood of the diseased parts appears of a somewhat dark grey colour, whilst the mycelia of the fungus, at first whitish, become yellow, and ultimately brown (*Comp. rend.*, cxvii., 342).

**Myxobacteriaceæ.** This is the name proposed by R. Thaxter for a new group of schizomycetes, somewhat resembling the myxomycetes. The organisms are found in gelatinous growths on decaying wood, fungi, etc., and are motile, rod-like organs, multiplying by fission. They secrete a gelatinous base, and form pseudoplasmode-like aggregations before passing into a cyst-producing state, in which the rods may become encysted in groups or may be converted into spore masses (*Bot. Gazette*, through *Bact. World*, ii., 180).

**Antiseptic Essences.** Dr. F. Forné finds that the vapours given off, in a limited enclosed space, by the essences of niaouli and cajeput hinder the growth of certain bacteria and moulds, whilst the fructification of the latter is delayed even when the space is not so limited. The sterilising action is chiefly exerted upon the culture medium, and the sterilising power of the vapours from the essences is proportional to the time during which they have acted upon this medium and the extent to which it is impregnated by them. Other things being equal, essence of niaouli acts better than oil of cajeput, but it is noted that the former, placed in direct contact with the spores of *Penicillium glaucum*, stimulates their vegetative energy (*Ann. de l'inst. Pasteur*, vii., 529).

**Solution of Salicylic Acid.** M. Jaudon prepares a concentrated solution of this acid by dissolving eight grammes in twenty-four grammes of alcohol of 90° strength. He then dissolves four grammes of borax in eight of neutral glycerin, mixes the two solutions, and adds sufficient distilled water to make one hundred grammes. An eight per cent. solution of the acid is thus obtained (*Rép. de pharm.*, [3], v., 341).

**Monochromatic Flame.** H. W. Wiley describes an ingenious lamp for producing a constant monochromatic flame such as is now so frequently found of value in optical experiments. It consists essentially of two wheels, driven by clockwork, mounted so that their axles are on the same horizontal line. Their perimeters consist of platinum gauze and the spokes of platinum wire. Beneath each wheel is a porcelain crucible containing sodium chloride or bromide in saturated solution, into which the peripheries dip. The gas burner is fixed between the crucibles, and when, by means of crossed bands, the wheels are made to revolve in opposite directions, they take up a little of the salt solution by the platinum network of their rims, and a minute fresh portion of the salt is thus introduced into the flame every instant. Since the water evaporates from the warm metal before the flame is reached the sputtering caused by a moist salt is avoided, and a perfectly uniform light is obtained, which, it is claimed, can be used for hours without any perceptible variation (*Journ. Am. Chem. Soc.*, xv., 121).

**New Weighing Pipette.** Dr. H. Schweitzer describes a new form of apparatus for weighing liquids for analytical purposes. It is extremely simple and ingenious, having the general appearance of an ordinary bulb pipette. The suction tube, however, is extended beyond the point where it joins the bulb, and terminates in a short capillary tube, bent almost at right angles and with a very small aperture, which projects into and points towards the wall of the bulb, almost touching it. Exactly opposite to this point the wall of the bulb is slightly flattened, so that the pipette may rest firmly on the pan of a balance with the delivery tube inclined slightly upwards. Since the inner extremity of the suction tube will then be almost vertical, the liquid is thus prevented escaping at either end during the process of weighing. The pipettes are constructed with large or small apertures in the delivery tube, according to the physical properties of the substance to be weighed, and they can be warmed directly in the flame without danger of breaking them, when the weighed substance (lard, etc.) solidifies in the tube. The inside capillary tube must be turned up as much as possible to gain space, and its aperture must be very small to allow dropping and prevent liquid entering the suction tube. The apparatus can be cleaned easily by drawing benzene or hot soda solutions, etc., through it, then alcohol and ether, after which it can be dried in a current of air (*Journ. Am. Chem. Soc.*, xv., 190).

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, SEPTEMBER 2, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE CHICAGO MEETINGS.

THE forty-first annual meeting of the American Pharmaceutical Association commenced on Monday, August 14, under the presidency of Professor REMINGTON, to whom we are indebted for a report of his inaugural address, which will be found at page 198. After referring to the special circumstances under which the meeting took place, and offering a hearty welcome to the visitors who had been invited to assist in the organisation of the International Congress, Professor REMINGTON gave expression to the feeling of satisfaction experienced by the members of the Association at having present on that occasion for the first time delegates from the American Medical Association. Recalling the fact that for the past three years the Medical Association had invited the Pharmaceutical Association to send delegates to its annual meetings, and, as a consequence, that a section of materia medica and pharmacy had been organised for the discussion of subjects interesting both to medical and pharmaceutical practitioners, Professor REMINGTON regarded the further development of intercourse between the two bodies as promising to be of considerable advantage in promoting scientific research that would serve as a basis for the improvement of the national Pharmacopœia. In like manner he thought that this friendly co-operation of representatives of medicine and pharmacy would furnish plans for the reform of abuses, and assist endeavours to secure necessary and appropriate legislation for restricting the practice of medicine and pharmacy to those who are qualified for the responsible duties to be performed.

The issue of the revised Pharmacopœia of the United States was another circumstance mentioned in the PRESIDENT'S address. He pointed out with satisfaction the prominent part taken in the work of revision by members of the American Pharmaceutical Association. Among the principal changes that have been made, the introduction of the metric system of weights and measures was instanced as likely to be of great benefit to pharmacy, and the substitution of the principle "solids by weight, liquids by measure," in place of "parts by weight" in both cases, was mentioned as being more practicable with the metric system than with any other system of weights and measures. On the subject of standardisation much careful consideration has been expended, and the conclusion arrived at is that, however desirable it may be to have definite standards of strength for the preparations of many drugs, it is even more imperative that the methods of assay shall be trustworthy and capable of furnishing uniform results. From this point of view it has been decided that the only drugs in regard to which methods of standardisation can at present be applied are opium, cinchona, and nux vomica. The revision of the tests and descriptions relating to chemicals has been carried out with great care. So far as nomenclature admits of improvement by alteration changes have been introduced, though there is not yet sufficient general agreement among chemists to warrant any great departure from established usage. In the names of saline compounds the basylous constituent is now placed first, "sodium sulphate" being substituted for "sulphate of sodium," and the terminations "ic" and "ous" are used to represent the compounds corresponding respectively to higher and lower oxides.

In speaking of the extraordinary development of synthetic chemistry, and the effects produced upon medicine and pharmacy by the introduction of new remedies, Professor REMINGTON'S remarks bear evidence of the sense of weariness which medical men and pharmacists have experienced from having to deal with the flood of ephemeral products which have recently competed for recognition as therapeutic agents, under the protection of letters patent or with fancy copyright names which reduce them in many instances to the level of nostrums, whatever their actual efficacy may be. In view of the circumstance that any substance so controlled by one manufacturer or firm "becomes law unto itself," it has been decided to adhere to the principle adopted by the Convention in 1890, that no patented or proprietary medicinal substance should be introduced into the Pharmacopœia. Acetanilide, salicylic acid, and salol are therefore the only synthetic products which are officially recognised. Lastly, in regard to the limitation of the practice of pharmacy, while it is held to be in accord with the "universal fitness of things" that the medicine man is the proper person to sell medicines which are often dangerous in the hands of the inexperienced, it is also pointed out that medicines, like other commodities, will still be bought and sold according to the ordinary laws of trade, and all efforts to limit their sale must be framed in obedience to those laws. In seeking for a safe course for pharmacy through those troublous waters, Professor Remington counsels trust in organisation and in the sagacious efforts of its representatives, for such relief as is possible.

Among the papers read at the meeting, Mr. Dohme drew attention to the two varieties of coca leaves described by Dr. Burck (see *Pharm. Journ.*, [3], xxii., 817), and known by the names "Huanuco" and "Truxillo" leaves, showing that the former yield most cocaine, and also that the volumetric method of determining cocaine is most to be relied upon. Mr. Fennel read a paper on oil of cloves, pointing out the deficiencies of pharmacopœia descriptions and the best means of detecting sophistication. Mr. Scoville described an apparatus for measuring change of volume when liquids of different densities are mixed. Mr. Lloyd confirmed the existence of an alkaloid in *Caulophyllum thalictroides*, as pointed out by Mayer in 1863, and described its characters. Professor Sayre described the differences in the composition of taraxacum root at various seasons of the year. Mr. Nagelvoort contributed further information on Gerock's method of separating and determining strychnine and brucine. Messrs. Caspari and Dohme showed that the determination of alkaloids in galenical preparations may be effected more accurately by titration than by the usual plan of weighing. Mr. Dohme showed that the alkaloid in ipecacuanha root is situated chiefly in the cork layer and in the parenchyma cells closest to it. Mr. Fennel pointed out the deficiences in the pharmacopœia definitions of oil of turpentine, and suggested some improved methods of testing. Professor Edwards read a paper describing the construction of refractometers and their application in analytical laboratories.

## CONFERENCE MEETING AT NOTTINGHAM.

We find that there has been an accidental omission of some importance in our general report of the Conference proceedings, published on August 19. After the lady visitors had inspected Messrs. Mallet's lace factory on the Wednesday morning, they were all entertained by Mrs. S. Mason, wife of a member of the Local Committee, at Carlton House, Sherwood Rise. Here light refreshments were provided, and the arrangements, though made at short notice, are described as being on a quite exceptional scale. We have great pleasure in specially recording this, which is but one amongst many instances of the manner in which the Nottingham pharmacists were so ably assisted by the ladies of their families in dispensing hospitality at the recent meeting. We are requested by Mr. Wm. Gill to state that the photograph of members of the Conference and their friends, taken at Wollaton Park, is a very successful one. Copies may now be obtained from either of the local secretaries of the Conference, or direct from the photographer, Mr. A. Neale, St. Peter's Church Walk, Nottingham, and copies of the key will be sent to all subscribers as soon as completed.

## INTERNATIONAL PHARMACEUTICAL CONGRESS.

The long-cherished desire of American pharmacists to have an International Pharmaceutical Congress in the United States has at length been gratified, and the inaugural session took place on the 21st of last month, Professor Remington being chosen as the President, and Dr. Oscar Oldberg as the Secretary. We regret that the unfortunate illness of our reporter has prevented us from presenting our readers with a full report of the proceedings, for which arrangement had been made, and also from giving an account of the objects of interest to pharmacists in the Chicago Exhibition. From the scanty reports which have appeared in American journals it may be inferred that the modern development of pharmacy, by which the preparation of medicines is being transferred from the hands of individual operators to large factories, is most prominently represented at the Exhibition. Germany occupies a foremost place in the exhibition of chemical products of all kinds, and some German firms established in the United States exhibit in the American department, among them the firm of Fritzsche Brothers, which is a branch of Schimmel and Co., of Leipsic and Prague. Belgium, Denmark, Sweden, Switzerland, Italy, and Austria are represented by only a few exhibitors. Canada, Jamaica, and Japan have some exhibits of natural drugs, together with articles of perfumery and druggists' sundries. The British exhibits in the same group are equally miscellaneous.

## THE EPIDEMIC AT WORTHING.

In response to the appeal made for the Worthing Sick-Poor Fund (see *ante*, p. 167), we are informed by Mr. William Frost that the following subscriptions have already been received from the drug and allied trades:—

| | £ | s. | d. |
|---|---|---|---|
| Messrs. R. Hovenden and Son ...... | 5 | 0 | 0 |
| The Sussex Drug Co. .................. | 1 | 1 | 0 |
| Messrs. D. and W. Gibbs ........... | 1 | 0 | 0 |
| The Berkefeld Filter Co................ | 1 | 1 | 0 |
| Messrs. Hodgkinsons, Treacher and Clarke .................................... | 0 | 10 | 0 |
| Messrs. May, Roberts and Co......... | 1 | 0 | 0 |
| Messrs. Herring and Co................ | 0 | 10 | 6 |
| Mr. White ................................ | 0 | 10 | 0 |
| Messrs. Hearon, Squire and Francis | 1 | 1 | 0 |
| The Apollinaris Co. ...................... | 1 | 1 | 0 |
| Messrs. Hill and Son .................. | 2 | 2 | 0 |
| Messrs. Meggeson and Co. ............ | 1 | 1 | 0 |
| Messrs. Toogood and Son ............ | 1 | 1 | 0 |
| Mr. A. S. Hill............................ | 2 | 2 | 0 |
| Mr. E. R. Biggleston (Canterbury).. | 0 | 5 | 0 |
| Messrs. Potter and Clarke ............ | 0 | 10 | 6 |
| Mr. James Townsend ................. | 0 | 5 | 0 |
| Mr. John Thorp (Heaton Chapel)... | 2 | 2 | 0 |
| Messrs. Burroughs, Wellcome and Co. .......................................... | 3 | 3 | 0 |
| Mr. H. Silverlock ........................ | 2 | 2 | 0 |
| Messrs. Allen and Hanburys ......... | 1 | 1 | 0 |
| Messrs. Hearon, Squire and Francis | 1 | 1 | 0 |
| Messrs. F. Newbery and Sons ...... | 1 | 1 | 0 |
| Messrs. Ford, Shapland and Co...... | 1 | 1 | 0 |
| Messrs. Smith and Co................. .. | 1 | 0 | 0 |
| Messrs. E. Bentley and Son ......... | 1 | 1 | 0 |
| Messrs. Harker, Stagg and Morgan. | 0 | 10 | 6 |
| Messrs. Blondeau et Cie .............. | 0 | 10 | 6 |
| Messrs. F. Schutze and Co............. | 0 | 5 | 0 |
| Valentine's Meat Juice Co............. | 1 doz. bottles | | |

# British Pharmaceutical Conference.

## MEETING AT NOTTINGHAM.

*Tuesday, August 15.*

(*Continued from page 180.*)

### NOTE ON THE SPECIFIC GRAVITY OF SANDAL WOOD OIL.

BY MICHAEL CONROY, F.C.S.

The specific gravity of sandal wood oil, as given by the various authorities, differs to a very great extent. For instance, the British Pharmacopœia states that it is "usually about" ·96; the United States Pharmacopœia "about" ·945; Squire's 'Companion,' 15th edition, ·970 to ·980 when distilled in London, and ·990 when distilled in India; Pharmacographia, ·963. Mr. E. M. Holmes, in a very able and interesting paper, published in the *Pharmaceutical Journal* of March 27, 1886, gives the specific gravity, on the authority of Mr. Ince, as ·9713 for English oil, and from ·9738 to ·9797 for German oil. Mr. Peter MacEwan, in a paper published in the *Pharmaceutical Journal* of Feb. 11, 1888, calls attention to the low specific gravity given in the British Pharmacopœia, and recommends that it be raised to ·970–·990. More recently Mr. Cripps states that he considers the Pharmacopœia density too low, and recommends that it be raised to ·970. He gives particulars of three samples obtained from English houses of repute. These were ·9765, ·9759, and ·9784.

Whilst fully appreciating the value of these very excellent papers, we cannot overlook the fact that the authors were labouring under the disadvantage of working with samples which they did not make themselves. This note is the result of experiments personally conducted on a manufacturing scale with the object of throwing a fuller light on the subject, and I hope to be able to show that the specific gravity of carefully made sandal wood oil is fairly constant, and, on the other hand, that carelessly made oil, though absolutely pure, may vary to a considerable extent. I also hope to show why the Indian-made oil is of greater density.

A distiller of this oil soon discovers that the density increases as the distillation proceeds, the lighter portion coming over first and the denser last. This holds good with all essential oils that I have observed. The following two experiments show how the density varies:—

A 6 cwt. charge of very fine Mysore wood was placed in the still and the oil collected in six fairly equal portions as it came over. The specific gravities of the first, third, and sixth were carefully taken at 60° F. These were respectively ·9683, ·9763, and ·9833, and the whole six fractions when mixed ·9752.

A similar charge of very fine Mysore root was next placed in the still and treated in the same way. The specific gravities of the fractions were practically the same, and the whole when mixed together gave ·9758.

These experiments show how important it is to mix the whole of the oil of each distillation together, and I think they show how discrepancies have arisen as to the correct specific gravity of this oil.

During the past few weeks I have taken the specific gravities of over a dozen other batches of this oil, distilled under my personal supervision. These ranged between ·9750 and ·9759, the difference being only in the fourth decimal place. The lowest specific gravity I have met with distilled under my own supervision was one of ·9720.

In Mr. MacEwan's paper referred to above, reference is made to the oil distilled in India being of much greater density than that distilled in England from the same wood. The sample of Indian oil examined by Mr. MacEwan had a density at 16° C. of ·9896. This oil was specially distilled in Mysore for the Museum of the Pharmaceutical Society, Dr. Bidie, of Madras, having got it done at Mr. Holmes' request. There was, therefore, no doubt of its genuineness, and its high density appeared to me to be due to the manner in which the oil is prepared in India. This process is very fully described in Mr. Holmes' paper on the authority of Dr. Bidie, from which it appears that a charge of 50 lbs. of chipped sandal wood is placed in an earthen still, covered with water which is renewed from time to time, and distillation carried on for ten days and nights, the produce of oil from this quantity of wood being 20 ozs. It having occurred to me that this long exposure of the oil to the action of steam, air, and water was sufficient in itself to account for the higher density of the oil, I put my theory to the test in the following simple way:—One pint of English made oil of known density was placed in a jar with about five gallons of water and kept at a temperature of about 120° F. for ten days and nights. The oil increased in viscosity, became darker in colour, and the specific gravity increased from ·975 to ·989. The loss of oil in the experiment was half an ounce, due chiefly to waste.

In England the oil is made in about one-fourth of the time, in much larger operations, with more perfect apparatus, and is carefully collected as it comes over from the still to avoid oxidation. This difference in the mode of manufacture, together with the experiment just referred to, fully explains what has hitherto seemed a mystery, and it explains also why the English made oil is so much superior to the Indian.

The chief point to be drawn from this note is that the specific gravity given in the British Pharmacopœia is too low in the face of the fact that all likely adulterants are of lower density. In my opinion it should be raised to a minimum specific gravity of ·972 at 60° F.

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The PRESIDENT said he could not help thinking that possibly the cause of the foreign oil being so inferior to the English was that the latter was obtained from the best chips, whilst the Indian oil was collected not only at a higher temperature but very probably from refuse wood not worth exporting. Probably, also, the Indian oil was adulterated before it came over.

Mr. DRUCE asked if Mr. Conroy took account of the relative proportions of the oils of different specific gravity, and also if he had any information as to their relative value therapeutically; the general result would appear to show that the heavier oils were of less value than the lighter, although it was upon the effects of the heavier oil that the reputation of oil of sandal was gained.

Mr. R. WRIGHT did not think there was any essential oil used in pharmacy which differed in density to so great an extent as that of sandal wood. He had had it as light almost as oil of lemon, and had some now in stock which was almost as thick as castor oil. He had often wondered what was the reason of this variation in density.

Mr. P. MACEWAN said this paper was very interesting, but it was mainly corroborative of previous work, and it was very gratifying to those who, like himself, had advocated the alteration of the official specific gravity to ·870 to find that Mr. Conroy, from practical experience, agreed with them. Sandal wood oil was not only one of the most variable materials used in medicine, but one of the most interesting. Its therapeutical value was originally based entirely on the Indian distilled article, but now he believed very little of that was imported. What was used was distilled either in this country, in Germany, or in the United States. He thought any specimen which was as light as oil of lemon must be spurious, but the great difference in density which undoubtedly existed was, he believed, due to the age of the wood and the part of the wood employed. Nice, fresh heart wood would yield an oil which might be anything between ·860 and ·870, simply because it had not been sufficiently exposed to enable the oil to be oxidised. And so with old wood exposed in chips and small pieces they would expect that it would yield a denser oil. A short time ago he heard from a gentleman who had been investigating the distillation of this oil in Mysore the reason why the Indian oil was so heavy, and it was exactly what Mr. Conroy had indicated.

Mr. CONROY, in reply, said he could not agree with the President that the greater density of the Indian oil was due to its being made from refuse wood, and thought it very unlikely. He had tested many samples of Indian oil, and never met with one which was adulterated. There was not so much coming into the market now because the English was cheaper. He stated in the note that the oil was separated into six equal portions, the first, third, and sixth being the ones of which the specific gravity was taken; they were not exact measurements, but as nearly so as possible. He thought the viscosity of the oil referred to by Mr. Wright was owing to age and oxidation.

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## NOTE ON THE ALKALOIDAL STRENGTH OF HEMLOCK FRUIT.

BY E. H. FARR AND R. WRIGHT.

In bringing forward the subject of the present note we must apologise for the want of originality in our work, but the subject is of such importance that we consider it imperative to call the attention of pharmacists generally to the existing condition of things.

In the B.P., 1867, "The dried ripe fruit of *Conium maculatum* " was official, and was used for making the tincture, but owing to the exhaustive researches of Sir R. Christison, Dr. Manlius Smith, and Dr. Harley, who proved the comparative worthlessness of the ripe fruit and advocated the use of the unripe in its place, the compilers of the present B.P. altered their description to meet the recommendations of the fore-named investigators; consequently the fruit now official is directed to be "Gathered when fully developed, but while still green, and carefully dried."

We had occasion in a note on tincture of conium, published in *Pharm. Journ*, [3], vol. xxi., p. 858, to refer to the great variation in the strength of the fruit found in commerce, and we stated that of eleven samples then examined, only one corresponded to the B.P. description of "Conii Fructus," that being of English origin. We append the alkaloidal value of the samples then examined, as calculated from the strength of the tinctures yielded by them.

*Table I.—showing the alkaloidal strength of commercial hemlock fruit :—*

Hydrochlorates of mixed alkaloids per cent.

| | |
|---|---|
| 1 | 1·304 |
| 2 | ·600 |
| 3 | ·512 |
| 4 | ·568 |
| 5 | ·832 |
| 6 | ·816 |
| 7 | ·800 |
| 8 | ·096 |
| 9 | ·768 |
| 10 | ·800 |
| 11 | ·800 |

The sample No. 8 was in fine powder, and afforded a green tincture, but it had evidently been overheated in drying, and thus spoilt.

At the time we stated our opinion that the poor quality of commercial fruit was due to the fact that it was allowed to ripen before being gathered, and not owing to loss of alkaloid on keeping, as suggested by Harley; but we determined on an investigation to clear up that point, and to determine what should be the strength of B.P. dried fruit. With these ends in view, a quantity of fruit was collected by one of us from wild plants, in August and September, 1892, and in July of the present year, and divided into portions corresponding to the average development of the fruit on each umbel, which would vary considerably, the outer fruit being much larger than the inner. The samples represented the different stages of growth from the fall of the petals to full ripeness, and were collected from time to time as opportunity occurred. The plants from which they were gathered differed considerably in size and height, according to age and situation. We append the results obtained on estimation of the various samples.

*Table II.—Showing the alkaloidal strength of hemlock fruit, fresh and dried, in various stages of development :—*

Hydrochlorates of mixed alkaloids per cent.

| | 1892. | | 1893. | |
|---|---|---|---|---|
| | Fresh. | Dried. | Fresh. | Dried. |
| Immature, $\frac{1}{4}$ to $\frac{1}{2}$ grown | — | — | ·896 | 3·00 |
| " $\frac{1}{3}$ to $\frac{2}{3}$ " | ·975 | — | — | – |
| " $\frac{1}{2}$ to $\frac{3}{4}$ " | — | — | 1·049 | 3·32 |
| Nearly mature, $\frac{3}{4}$ to full grown | ·935 | — | — | – |
| Mature, $\frac{3}{4}$ to full grown | — | — | 1·088 | 3·36 |
| Mature, a few outer ones beginning to turn slightly yellow | — | — | 1·049 | – |
| Mature, yellowish green to yellow | ·475 | — | — | – |
| Mature, yellow | ·434 | 1·44 | — | – |
| Ripe, grey | — | 1·32 | — | – |

The amount of moisture in the fresh fruit varies from about 60 per cent. in the older stages to about 68 per cent. in the younger, but is not a constant proportion.

It will be noticed that the present season's fruit is of better quality than that of 1892; in fact, it may be looked upon as containing the maximum amount of alkaloid likely to occur.

Another point worthy of attention is the rapid falling away in alkaloidal value which occurs as the fruit begins to ripen and which, no doubt, is the chief cause of the poor quality of the commercial drug, though we have not been able to collect any sample approaching the poor quality of the average imported fruit.

Our next experiments were conducted with a view to ascertain whether the fruit loses any alkaloid when carefully dried. Harley, in his formula for tincture of the immature fruit of hemlock, recommends 5 ounces of dried or 8 ounces of undried immature fruit to be made into a pint of tincture; therefore, if 5 ounces of the dried are only equivalent to 8 ounces of the fresh fruit, it must be inferred that about half the alkaloid is lost on drying, because the fresh fruit contains about 65 per cent. of moisture. Our own examinations of dried fruit, however, pointed to a different conclusion, therefore, to settle the point, portions of fruit in three separate stages of development were taken and divided, each into two parts as nearly alike as their condition allowed, though being attached to their stalks strict accuracy was not attainable. One portion was well bruised, and sufficient spirit and water respectively added to make a tincture containing 70 per cent. of alcohol by volume, allowance being made for the moisture in the fruit; the other portion was dried at 100° F., powdered, and converted into tincture by percolation with 70 per cent. spirit.

The results obtained on examination of the tinctures corresponded very nearly, and indicated the following proportion of alkaloid in the fresh and dried fruit respectively, weighed as hydrochlorate.

| | Fresh fruit. | Dry fruit. | Calculated for dry fruit. |
|---|---|---|---|
| Immature fruit ..... ... | ·896 | 3·00 | 2·8 |
| Nearly mature ............ | 1·049 | 3·32 | 3·28 |
| B.P. fruit ........ ........ | 1·088 | 3·36 | 3·40 |

These figures prove that no appreciable loss of alkaloid occurs in drying hemlock fruit at 100° F.

There is a marked difference in appearance between tinctures made from the fresh and from dried fruit; that from the fresh remains bright and free from sediment, whilst that from the dried very soon goes turbid and forms a deposit.

With reference to the keeping properties of the dried fruit, we have not much evidence to offer, but the following will be of interest as bearing on the point. The remains of the sample of fruit used in the preparation of No. 1 tincture, described in our paper on "Tincture of Conium," previously referred to, were set aside in an open box, merely wrapped in paper as received from the wholesale house. On recently looking up the sample, the fruit was found to be mouldy and worm-eaten. After separation of the larvæ and debris the other portion was estimated, and the results proved that no loss could have occurred, as the yield of alkaloid was greater than in 1890, to an extent proportionate to the loss of substance owing to the depredations of the grubs, which had evidently avoided the alkaloidal portion of the fruit.

After the foregoing evidence, afforded by the examination of authentic specimens, we consider that hemlock fruit, if collected in the proper stage of development and carefully dried, should yield about 2 per cent. of alkaloidal hydrochlorates, and that the tincture should be standardised to contain ·2 per cent. of conine or ·25 per cent. of hydrochlorate. The dose for a tincture of this strength would be the same as that given for the official tincture.

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The **President** said this was another paper of great practical value. Being a volatile alkaloid, of course conium was one of those tinctures which were most open to suspicion, and the fruit as it was received from the herb collectors was generally over ripe.

**Mr. Ransom** asked if the authors had examined any foreign samples of conium fruit.

**Mr. Elborne** asked if any difficulty had been found in obtaining the requisite quantity of wild specimens; if so, he could mention a plantation about ten miles from Nottingham where it grew plentifully.

**Mr. Farr**, in reply, said the real object of the paper was to point out that as soon as the fruit began to turn yellow, it immediately lost in strength. It should therefore be collected in the stage of those now shown. This would cause no difficulty, because at that stage the bulk of the fruit would be of full size, and possibly a fourth of them not fully developed. Of the eleven samples referred to in the first table, of which only one reached 1 per cent., the sample which was above that was English, all the rest were foreign. They had no difficulty in getting as much of the wild fruit as they required.

The Conference then adjourned to the next day.

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*Wednesday, August* 16.

The **President** took the chair at ten o'clock this morning, and the business commenced at once with the reading of a paper on:—

## COMMERCIAL BEESWAX.

BY ERNEST J. PARRY, B.SC., AND P. A. ESTCOURT, A.I.C.

A large dealer having recently drawn our attention to the amount of adulterated beeswax at present on the market, we obtained samples from sources of various descriptions with a view to seeing if the adulteration was as general as we were led to believe. We obtained twelve samples in all, some of them from the best London wholesale druggists. Of these eight were adulterated and four genuine. It is worthy of note that the samples obtained from the best houses were the most heavily adulterated. Indeed, one of these might better have been described as "adulterated paraffin," consisting, as it did, of about 75 per cent. of paraffin and 25 per cent. of beeswax. The usual adulterations of this substance are colophony, paraffin, stearic acid, carnauba wax, and spermaceti, in addition to bodies such as gypsum, ochre, and sulphur. Of these we have been able to find only paraffin, stearic acid, and resin (in the samples above referred to).

The general method of analysis used was that of Hübl, by determining the amount of potash required for neutralisation of the uncombined acids, and also that required for saponification of the ethers. The melting-point and specific gravity were taken, the latter by Chattaway's method, and special tests were applied in cases where adulteration was probable. Resin was detected by the nitric acid test in one case only. Five grammes of the sample were boiled with 20 c.c. of nitric acid, and after cooling diluted with water and shaken with ammonia; the presence of resin was indicated by an intense red coloration. Paraffin was indicated in many of the samples by the low amount of alkali required for both neutralisation and saponification. Its isolation was effected by decomposing the beeswax by boiling it with strong sulphuric acid. The fluid frothed and evolved sulphurous acid, and much charring took place. The mass soon became solid, and was washed with water and exhausted with ether in a Soxhlet's apparatus. The charring was repeated twice, sometimes three times. The paraffin hydrocarbons were thus separated in a nearly pure state. The melting point of these were taken and found to be in nearly all cases about 4°–6 below that of the sample from which they were extracted; for example, in samples Nos. 5 and 6 the paraffin melted at 54°.

Below is a table embodying the results of the analyses. We may point out that the accepted figures for genuine wax are as follows:—

| | Sp. gr. at 15°·5. | Sp. gr. at 100°. | Melting point. | P. c. of KOH for acids. | P. c. of KOH for ethers |
|---|---|---|---|---|---|
| Unbleached wax... | ·9630 | ·8220 | 63°·5 | 2·0 | 7·5 |
| Bleached (air)...... | ·9610 | ·8180 | 63°·5 | 2·0 | 7·5 |
| „ (chemically) | ·9640 | ·8270 | 63°·5 | 2·4 | 7·1 |

Although paraffin and resin were the only adulterants we were able to actually detect, in those cases where we extracted the hydrocarbon wax, and the percentage of potash used for neutralisation of the free acids was greater than the amount of beeswax present required, we could only assume that this was accounted for by the presence of stearic acid. For example, in sample No. 5 the percentage of myricin found was 25. Taking 85 per cent. as an average pure wax, this represents 30 per cent. of beeswax, which would require about ·6 per cent. of potash for neutralisation of the free acids. The sample, however, required practically 2·2 per cent., that is 1·6 per cent. in excess, which represents 8 per cent. of stearic acid. The only reason we have for offering this note to the Conference is to point out to what an alarming extent even the best druggists are supplying adulterated wax, and we think the Pharmacopœia might well give some fuller and more decisive tests than it at present does for this article.

*Table of Analyses.*

| No. | Description. | Melting Point. | Specific Gravity at 15°·5. | Specific Gravity at 99°. | Percentage of KOH for acids. | Percentage of KOH for ethers. | Total percentage of KOH. | Calculated for Cerotic Acid. | Calculated for Myricin. | Approximate percentage of beeswax. | Adulterants. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Pure unbleached beeswax. | 72° | ·9800 | — | 8·98 | 4·0 | 12·98 | 65·7 | 48·3 | 56 | Resin. |
| 2. | Pure bleached beeswax. | 64° | ·9620 | — | 2·3 | 7·43 | 9·76 | 16·8 | 89·6 | 100 | — |
| 3. | Pure bleached beeswax. | 60° | ·9500 | — | 2·7 | 6·0 | 8·7 | 19·9 | 72·4 | 84 | Paraffin and stearic acid. |
| 4. | Pure unbleached beeswax. | 64° | ·9629 | ·8190 | 1·96 | 7·29 | 9·36 | 14·4 | 88·0 | 100 | — |
| 5. | Pure unbleached beeswax. | 57° | ·9240 | ·7920 | 2·18 | 2·07 | 4·25 | 15·9 | 25·2 | 30 | Paraffin and stearic acid. |
| 6. | Pure unbleached beeswax. | 57° | ·9180 | ·7857 | 1·53 | 4·70 | 6·23 | 11·2 | 56·7 | 66 | Paraffin and stearic acid. |
| 7. | Pure unbleached beeswax. | 64° | ·9620 | ·8185 | 1·96 | 7·0 | 9·07 | 14·4 | 84·5 | 100 | — |
| 8. | Pure bleached beeswax. | 62·5° | ·9630 | ·8180 | 2·4 | 7·1 | 9·50 | 17·5 | 85·7 | 100 | — |
| 9. | Pure bleached beeswax. | 59° | ·9660 | — | 1·25 | 6·6 | 7·85 | 9·2 | 79·7 | — | Paraffin. |
| 10. | Pure bleached beeswax. | 51·5° | ·9393 | — | 0·61 | 2·46 | 3·07 | 4·5 | 29·7 | 35 | Paraffin. |
| 11. | Pure unbleached beeswax. | 59° | ·9451 | — | 2·37 | 6·22 | 8·59 | 17·4 | 75·0 | 88 | Paraffin and stearic acid. |
| 12. | Pure unbleached beeswax | 61·5° | ·9346 | — | 1·29 | 3·06 | 4·35 | 9·4 | 37·0 | 44 | Paraffin and stearic acid. |

The **President** said everyone would agree that this paper contained a serious indictment, and demanded the most careful consideration. He had no idea that beeswax was adulterated to anything like such an extent. Living in a country district, he had no difficulty in obtaining from those who kept bees sufficient wax for his requirements, but that did not apply to large towns, and especially to London, where the chemist had to depend upon the wholesale houses. Who was responsible for this adulteration was a very serious question. He had always supposed that the wax supplied in half basin-shaped blocks was pure, though sometimes of indifferent colour.

Mr. **Naylor** said it should be remembered that beeswax was used for other purposes as well as pharmacy. There was a mixture, such as Mr. Parry had referred to, of solid paraffin and beeswax, and it was not at all uncommon for wholesale houses to be asked for the mixture under a particular name, for certain purposes which had nothing to do with galenicals. He was surprised to hear that beeswax was adulterated with stearic acid, and he should like to know if there were any other circumstantial evidence, apart from the analytical data given, to confirm that statement. He would also ask Mr. Parry if he had made blank experiments, adding so much paraffin, or stearic acid, to pure beeswax, and comparing the results with his previous ones. He believed that the beeswax in the English market was principally drawn from the country districts, and it was a common thing for wholesale houses to be dependent almost exclusively on their customers to supply them. He was much surprised at the results brought forward, and though he did not in the least question the correctness of the analyses, he thought the facts were to be accounted for in some other way than by wilful adulteration.

Mr. J. **Laidlaw Ewing** deprecated the employment of such strong language as appeared in the paper, which when published would lead people to believe that the best chemists were in the habit of supplying adulterated beeswax. As far as he knew nothing of the kind prevailed in Scotland, where they had an abundant supply of genuine beeswax.

Mr. **Linford** said there was one very obvious source for the so-called adulteration by paraffin. It was a very common practice now with bee-keepers to put into their hives comb foundations for the bees to build on, and these were frequently made of paraffin wax. Of course, when the bee-keeper had extracted the honey he melted down the comb, paraffin foundation and all, without any intention to adulterate, and the wax thus obtained might easily show 10 per cent. of paraffin.

Mr. **Grierson** thought the author had done a great service to the wholesale as well as the retail trade. It was high time that attention was called to the matter, for it was well known in the wholesale trade that so-called genuine wax was sold at a lower price than it could be got for. It was offered regularly at 1*s.* 2*d.* lb., whereas the genuine article could not be bought in large quantities for less than 1*s.* 4½*d.* or 1*s.* 5½*d.* The wholesale trade was not entirely to blame; the retail trade had the matter pretty much in their own hands, for it was perfectly possible to get pure wax if they insisted on it. It was not at all necessary that the wax should be English. Some of that imported from Holstein and also from Jamaica appeared to him to be thoroughly genuine, and quite equal as regarded its physical properties to the English article. Perhaps one reason of the present state of things was the difficulty of testing it, and if the method now suggested were a ready one, and the subject were taken up generally, much good might be done.

Mr. **Burden** said he could confirm what the President had said about the difficulty of getting pure wax in London. In the old pharmacopœia it was a very important article, and preparations made with different sorts of wax varied very considerably. The difficulties he had experienced in getting really fine genuine beeswax were so great that for many years he had obtained it from the bailiff on a nobleman's estate in Essex, and honey also; and it was quite different to what he could get from any wholesale house in London. Many preparations depended to a great extent for their efficacy as well as keeping properties on the purity and character of the beeswax, and the matter was therefore of very considerable importance.

Mr. **Conroy** said no doubt there was a lot of adulteration in beeswax, but the wholesale houses were not to blame He believed Mr. Parry alluded chiefly to white wax.

Mr. **Parry** said no; he tested seven yellow samples and five white, and of the adulterated ones five were yellow and three white.

Mr. **Conroy** said he was surprised at that. There was no doubt a great deal of adulterated beeswax on the market, but for pharmaceutical use there was plenty of pure wax to be had from almost any London or provincial house. In Liverpool there was an enormous amount imported from North America and Chili, and he very rarely found it adulterated. He had never found gypsum, ochre, starch, or resin in beeswax; those adulterants were found in text-books, but not in commerce. Nor had he ever found stearic acid. The usual adulterant for white wax was spermaceti, which was added to whiten it, and for yellow wax, ceresin.

Mr. **Druce** thought Mr. Parry had done good service in bringing this matter forward. If a person asked for beeswax he ought to get it; if he wanted ceresin he could order it.

Mr. **Burford** said some gentlemen seemed to think that the wax obtained in the country was quite unsophisticated, but he had met with it containing a large amount of yellow soap.

Mr. **Butler** said much of the foreign wax imported was quite equal to anything obtained from the rural districts of England; it was quite as free from adulteration, and answered equally well. This could be obtained and sold at 1*s.* and 1*s.* 2*d.* a lb., or even less.

Mr. **Conroy** said a very common adulterant of foreign wax was in the shape of stones weighing from 7 to 14 lbs.

Mr. **Parry**, in reply, said he knew that some time ago people in the country had a much better chance of getting pure beeswax than those in London; but he believed a good deal of that now sold by London houses was imported. It was acknowledged on all hands that there was a mixture of paraffin and beeswax on the market, which was not used for pharmaceutical purposes, but his point was that it was used for such purposes. It was almost an open secret that the white flat saucer wax was invariably adulterated, because it was regularly melted down with paraffin before it was supplied; but he was careful to obtain every sample except one—which was no doubt the worst—as pure genuine beeswax in the lump form, which had not been cast in a saucer. He had the sample still, and if he could find it he would send it to Mr. Naylor. There was no question of blank experiments; if you boiled beeswax three times with concentrated oil of vitriol under a condenser, and extracted with ether, there was no question of beeswax; hydrocarbon wax was the only thing which would stand that treatment. He did not think stearic acid was a mere text-book adulterant; Mr. Allen made a strong point of it in his 'Commercial Analysis;' nor were some of the other adulterants, sulphur for instance. The practical inconvenience resulting from this adulteration was very great. After he had written this note he was brought a large number of stock articles which his firm sent out, in which beeswax was an ingredient, and the wax had been so soft owing to the presence of paraffin that the whole of them melted during the warm weather. They could not get pure beeswax, and were obliged to use carnauba wax to get the required consistence. He had no desire that these things should be published in the newspapers, but he thought it very desirable that the pharmaceutical press should deal with the matter. He noticed that most of the gentlemen who agreed with him had examined a large number of samples, but those who differed from him seemed to go by their general impressions. As to the tests, the specific gravity was a very simple one; the Pharmacopœia limits were far too wide, ·950 to 970. He should not allow more than from 960 to ·965, with perhaps a margin of one on each side. When you had beeswax melting at 51° there could be no question about it. He did not think it necessary to make blank experiments, because the analytical figures were so well understood. The specific gravity and melting point were practically fixed; the amount of potash should not vary more than from 9 to 10 per cent., but he had a sample going down as low as 4 per cent. of potash for complete saponification and neutralisation. On the whole he thought he had treated the subject very mildly.

Mr. **Naylor** said it was not the question of detecting paraffin in beeswax which required check experiments, but to ascertain whether the results were quantitatively correct as well as qualitatively.

Mr. **Parry** said the quantity was determined by the amount of potash, but in many cases they actually weighed the paraffin, and as a rule it corresponded within 5 per cent. Of course the method was a little crude, but as a rule the paraffin obtained by weight agreed with that obtained by saponification.

## NOTE ON EASTON'S SYRUP.

BY R. WRIGHT,

*Pharmaceutical Chemist.*

The original formula for this syrup, as published by Dr. Aitken in his 'Science and Practice of Medicine,' included (1) the preparation of ferrous phosphate by precipitating a solution of ferrous sulphate with an excess of sodium phosphate, (2) the preparation of quinine hydrate by treating an acid solution of the sulphate with a slight excess of ammonia, and (3) the solution of the well-washed precipitates, together with a fixed quantity of strychnine, in dilute phosphoric acid; the process being completed by the addition of sugar, which was dissolved in the solution without the employment of heat.

As originally devised, the syrup was intended to contain the equivalent of 1 grain quinine sulphate, $\frac{1}{32}$ grain strychnine (alkaloid), and 1 grain hydrous ferrous phosphate in each fluid drachm.

The process published by Dr. Aitken was faulty in more than one respect, and although, judging from the quantities given in the formula, the evident intention was to produce 24 fluid ounces of syrup, the wording of the recipe was so vague and indefinite, that in the hands of different operators it might yield, as shown by P. W. Squire (*Chemist and Druggist*, vol. xlii., 795), 25, 29, or 31 fluid ounces.

Taking into account the indefiniteness of the original recipe and the susceptibility of the ingredients to undergo physical and chemical changes, it is not to be wondered that the pharmaceutical mind has been greatly exercised over this compound, with the consequent result that numerous suggestions for its improvement have been made.

The following is a list—necessarily incomplete—of writers on the subject:—

T. B. Groves, 'Year-Book of Pharmacy,' 1869, p. 35.
W. L. Howie, 'Year-Book of Pharmacy,' 1876, p. 588.
E. B. Shuttleworth, 'Year-Book of Pharmacy, 1877, p. 244.
T. M. Clague, 'Year-Book of Pharmacy,' 1889, p. 380.
W. Lyon and W. Martindale, *Pharm. Journ.*, [3], vol. xxiii., p. 795.

P. W. Squire, *Chemist and Druggist*, vol. xlii., pp. 422 and 795.

An analysis of the literature of the subject shows that the attention of pharmacists has been directed mainly to the following points:—

1. The process best adapted for the introduction into the preparation of a definite quantity of ferrous phosphate.

2. The composition of the deposits (crystalline and amorphous) which appear in the syrup.

3. The cause, and prevention, of the development of colour in the syrup, on keeping.

4. The excessive acidity of this and other phosphatic syrups.

Several methods have been employed for the preparation of the ferrous phosphate. By Easton's original process at least 30 per cent. was lost, and in the B.P. 1867, sodium acetate was introduced, by which means the loss was reduced to about 20 per cent. Schweitzer proposed the substitution of sodium bicarbonate for sodium acetate, in order to neutralise the free acid, and this suggestion was adopted in the last edition of the British Pharmacopœia. By this means practically the whole of the phosphate theoretically producible is obtained.

It was, however, shown by Howie and others that in the phosphate thus prepared the proportion of ferrous phosphate was not greater than 50 per cent. H. W. Jones (*Pharm. Journ.*, [3], v., 541) was the first to suggest the production of the phosphate in solution by the direct action of phosphoric acid upon the metal, and this process is now very generally followed.

The deposit which occurs in the syrup varies in its character. As thrown down by old specimens it usually consists of ferric phosphate in an amorphous condition. Sometimes, however, as shown by Clague in a note read before this Conference in 1889, a distinct crystallisation takes place, accompanied frequently in cold weather by gelatinisation of the syrup and subsequent solidification.

The crystals formed consist of an acid phosphate of quinine.

The development of colour in phosphatic syrups was shown by Groves some years ago to be due to the production of caramel by the action of free phosphoric acid upon the sugar.

This conclusion is supported by the fact that the amount of discoloration in the syrup appears to vary according to the percentage of acid and of sugar present.

The development of colour is also accompanied by partial oxidation of the iron, and is proportionate to the amount of iron converted into ferric salt, the whole series of changes being induced through the agency of atmospheric oxygen.

Not only is the discoloration of phosphatic syrups attributable to the action of the free acid upon the sugar, but the crystallisation of the quinine salt has been referred by Dott, Lyon, and Squire to the same cause.

It is somewhat remarkable therefore that, when in the last edition of the British Pharmacopœia, the proportion of free acid in the official syrup of phosphate of iron was raised by 50 per cent., the fact would have escaped criticism, but that attention was drawn to it by Conroy, in a note read before the Liverpool Chemists' Association (*Pharm. Journ.*, [3], xvi., 379).

I believe that most, if not all, the ills of which we have to complain with regard to Easton's syrup, and also to syrup of phosphate of iron, are due to their extreme acidity.

Now it has been shown that the latter preparation may easily be made with only half the B.P. quantity of phosphoric acid, and that a syrup so made is stable and satisfactory.

Lyon has also proved that a preparation of this character is well adapted for the production of Easton's syrup, yielding a product which will keep for a reasonable length of time without depositing, crystallising, or undergoing discoloration.

A careful review of the whole subject has led me to the following conclusions:—

1. That the ferrous phosphate is best prepared by the direct action of phosphoric acid upon metallic iron.

2. That the employment of the official syrupus ferri phosphatis in the process for making this syrup should be discontinued.

3. That the quantity of sugar should be reduced by about 10 per cent., as suggested by Martindale and Clague.

The subjoined formula is drawn up in accordance with the above conclusions, and is submitted to the consideration of this Conference, and especially of the members of the Formulary Committee, in the hope that it may be found more satisfactory than existing formulæ:—

Take of:—

| | |
|---|---|
| Iron wire, free from oxide ......... | 75 grains. |
| Concentrated phosphoric acid sp. gr. 1·5 .............................. | 11 fl. drachms. |
| Strychnine in powder ............... | 5 grains. |
| Phosphate of quinine ............... | 120 grains. |
| Simple syrup ......................... | 13 fl. ounces. |
| Distilled water, a sufficient quantity. | |

Place the iron wire, and the phosphoric acid previously diluted with an equal volume of distilled water, in a small flask, plug the neck with cotton-wool, and heat gently until the reaction is complete; then add the strychnine and the phosphate of quinine, and shake till dissolved; filter the solution into the cold syrup, wash the filter, and add as much more distilled water as may be required to make the volume of syrup up to one pint.

The above preparation will contain 1 grain phosphate of iron, $\frac{3}{4}$ grain phosphate of quinine, $\frac{1}{32}$ grain strychnine in each fluid drachm.

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Mr. Strother asked if the author had tried putting samples in the sun to bleach, which he believed was recommended by some.

Mr. Wright said he thought that would be the best way to develop colour.

The President said he found Easton's syrup a very simple thing to make, but a very difficult one to keep. If this were owing to excess of acid, which caused grape sugar to be formed instead of cane sugar, the remedy would be simple, and he thought the discoloration was largely due to the same cause. Where only small quantities were required it would be better if liquor strychninæ could be substituted for powder, as there would be less chance of too much of that powerful agent being present.

Mr. J. Rutherford Hill asked how Mr. Wright's formula differed from that given by Mr. Lyon. As far as he could gather there was very little difference, and Mr. Lyon was in consultation with him during the progress of his work, so that he had an opportunity of seeing what was being done. The syrup he produced was very much like the sample now handed round; it kept perfectly under the most severe tests that such preparations could be subjected to. The chief point dealt with by Mr. Lyon was the question of the separation of crystals. He understood Mr. Wright to state that these crystals were acid phosphate of quinine, but was not quite sure whether that statement was based on experimental evidence. Mr. Lyon attempted to ascertain what these crystals consisted of, but no method he could devise was free from the very serious objection of possibly causing decomposition of the crystals in attempting to separate them in a state of sufficient purity to justify a statement that they consisted of acid phosphate of quinine. He thought it was proved by Mr. Lyon that the separation of these crystals was due to an excess of phosphoric acid, that it could be avoided by reducing the percentage of acid, that no other change was necessary, and that a perfectly stable and satisfactory syrup was produced. Possibly a reduction in the quantity of sugar might facilitate the development of colour. He gathered that this coloration was ascribed to exposure to sunlight, or that that had a powerful effect upon it, but he was not quite sure of that. Some years ago he purchased some Easton's syrup which was offered for sale in a grocery establishment; the density was rather low, and it evidently did not contain a high percentage of sugar; it seemed all right to look at, except that there was a slight separation of crystals. It had now been in his possession about four or five years, and had been kept in a place where sunlight was absolutely excluded, but it now looked very much like tar, being quite black. Altogether it was a very remarkable specimen, which he should be glad to submit to anyone who felt inclined to investigate this question of coloration. He did not think Mr. Wright had advanced the question much beyond the point at which Mr. Lyon left it, and he might add that subsequent experience had shown Mr. Lyon's formula to be very satisfactory, to yield a stable syrup, and to meet every reasonable requirement.

Mr. **Bird** thought the coloration might be partly due to the action of the phosphoric acid on the sugar, producing a caramel; but there was another cause also, viz., the well known reaction between the quinine salt and the iron, which Mr. Martindale referred to in a previous edition of his 'Extra Pharmacopœia.' A solution of phosphate of quinine and phosphate of strychnine could be kept in a bottle almost any length of time without changing colour, and so would a solution of ferrous phosphate if kept securely corked; but if the two were mixed a distinct coloration immediately took place, which went on increasing almost indefinitely. He had never seen this reaction satisfactorily explained, and did not know its exact nature, but it suggested the idea that the best way to secure a colourless syrup would be to keep the iron solution separate until it was wanted for use.

Mr. **Grierson** said anyone who had made Easton's syrup knew that from time to time when the quinine salt was dissolved in a solution of ferrous phosphate colorisation took place almost immediately. On the other hand, the latter solution, without the addition of quinine or even sugar, if exposed to the air would become brown, so that there must be a number of conditions which tended to turn ferrous phosphate dark. He considered there were three actions at work. First, the oxidation of the solution of ferrous phosphate; next, some kind of reaction between that and the quinine; and, thirdly, he had little doubt that when the syrup was kept some time there was also the production of caramel. He did not think it would ever be possible to make an Easton's syrup which would keep indefinitely, even when secured from the access of air. With regard to Mr. Wright's formula, he was inclined to think the syrup was too thin, and he did not consider that keeping it a month in a closed bottle was a sufficient test.

Mr. **Wright**, in reply, said he held that he was the first to point out in 1888, that the syr. ferri. phos. of the B.P. could be made with half the official quantity of phosphoric acid, and he also took great pains then to prove that such syrup could be kept for a long time without undergoing undue discoloration. He had now in his possession samples of syrups made to confirm the statements in the "note" referred to, and on looking over them the other day he was strongly tempted to bring them with him, because in the specimen made with the smallest possible quantity of phosphoric acid the discoloration had proceeded to only a very slight extent. He also showed in that paper that the amount of discoloration was proportionate to the quantity of free acid contained in the syrup, and that it was due directly to that free acid. Mr. Lyon had made use of his note as the starting point of his experiments, and went on to show that his syr. ferr phos. could be conveniently employed for making Easton's syrup, and that when so made it would keep for a considerable length of time. Mr. Lyon's formula was that of the Conference Formulary, the only difference being that he used the syr. ferri. phos. made from his (Mr. Wright's) formula in making the syrup. He did not claim any originality for this paper; he simply submitted the revised formula to Mr Naylor, as Secretary of the Formulary Committee, who suggested that he should write a note upon it, and he thought it a good opportunity to give a *résumé* of the literature of the subject up to the present time. The difference between his formula and that of Mr. Lyon was this: Mr. Lyon made his solution of phosphate of iron, then made a separate solution as ordered in the Conference Formulary of the strychnine and quinine phosphate in phosphoric acid, and mixed those two solutions with the proper quantity of syrup. It struck him that the whole process might be done at once, and that there was no need for making so many different solutions. He made a solution of phosphate of iron, added the phosphate of quinine and the strychnine, and shook up, and found they dissolved readily; the solution was then simply filtered into the syrup, and water added to make up the required quantity. There was that slight difference, but he did not wish in the least to depreciate Mr. Lyon's work. He had not proved by experiment that the crystals thrown down consisted of acid phosphate of quinine; he believed Mr. Lyon stated such to be the case, but thought he could not have said what acid phosphate it was. If the statement in his paper were erroneous he should be happy to correct it, but the literature of the subject had been carefully looked up. He believed that Mr. Dott had made a similar statement both at the last meeting of the Conference and at a meeting of the North British Branch, and Mr. Squire had come to the same conclusion. He did not quite understand whether Mr. Hill meant to state positively that no reduction in the quantity of sugar was necessary, or only to suggest it, but Mr. Martindale had suggested a 10 per cent. reduction, and Mr. Clague had proved that the gelatinisation and solidification of the syrup were due to the excessive amount of sugar, and had shown at any rate that it took place far more readily when the quantity was increased. He had no doubt the syrup he had shown would keep for twelve months easily, and he had great confidence n recommending this formula, which he was willing to call "Lyon's formula, slightly modified."

## NOTES ON EFFERVESCENT CAFFEINE PREPARATIONS.

BY LEWIS OUGH, F.C.S.,

*Pharmaceutical Chemist.*

Having occasion some time ago to examine numerous samples of commercial effervescing preparations, a difference in taste was frequently noticed in samples stated to be of similar strengths, and this difference was confirmed on determination of the active ingredient, which was frequently found to be below the amount stated. Being unable to find any note or paper dealing with this subject, it was thought that the publication of the results of an analysis of a series of commercial specimens would be of interest, and although I had hoped to have tabulated results of others besides caffeine preparations, circumstances have not permitted, consequently these must be left for some future occasion.

The specimens examined have been the citrate and hydrobromate, which in most cases have been taken from the original bottles of well-known makers, the strength being on the labels.

The examination in each case has been conducted as follows:—A weighed quantity of the preparation has been carefully dissolved in water, slight excess of dilute ammonia added, and the solution shaken up with four successive quantities of chloroform which has been separated and evaporated to dryness in a tared dish on a water-bath and weighed, this in each instance being identified as caffeine by the murexid test. It is almost unnecessary to mention that these preparations are usually labelled as containing so many grains of active ingredient in each drachm (or teaspoonful).

*Table I.—Effervescent Citrate of Caffeine.*

| No. | Stated strength. | Actual strength. |
|---|---|---|
| 1 | 1 in 60 | 1·96 in 60 |
| 2 | 1 in 60 | 1·35 in 60 |
| 3 | 1 in 60 | 2·69 in 60 |
| 4 | 2 in 60 | 1·64 in 60 |
| 5 | 2 in 60 | 1·90 in 60 |
| 6 | 2 in 60 | 1·21 in 60 |
| 7 | 3 in 60 | 2·97 in 60 |
| 8 | 3 in 60 | 3·10 in 60 |
| 9 | 5 in 60 | 3·45 in 60 |
| 10 | 5 in 60 | 5·31 in 60 |

*Table II.—Effervescent Hydrobromate of Caffeine.*

| No. | Stated strength. | Actual strength. |
|---|---|---|
| 1 | 1 in 60 | ·64 in 60 |
| 2 | 1 in 60 | 1·20 in 60 |
| 3 | 1 in 60 | 2·32 in 60 |
| 4 | 1 in 60 | ·91 in 60 |
| 5 | 2 in 60 | 1·96 in 60 |
| 6 | 2 in 60 | 1·30 in 60 |
| 7 | 2 in 60 | 1·98 in 60 |
| 8 | 3 in 60 | 1·96 in 60 |
| 9 | 3 in 60 | 1·57 in 60 |
| 10 | 3 in 60 | 2·13 in 60 |

In calculating these results, the official formula for the alkaloid and the citrate has been taken, and the hydrobromate as $C_8H_{10}N_4O_2 \cdot HBr.2H_2O$, as given in the 'Year Book,' 1891, page 40.

In reviewing the above results it will be seen that in Table I. only three samples (Nos. 5, 7, 8), and in Table II. a similar number (Nos. 4, 5, 7), may be looked upon as being correct in containing the amount of caffeine salt as stated.

Nos. 3 in each table were manufactured by the same firm, and one is quite at a loss to understand why the alkaloid is so much above the stated strength. But even the taste of these compared with a test sample made to contain one grain of the alkaloid salt in each drachm was very much more distinct and bitter. The other results are rather more favourable, but surely with a little more care in their manufacture these preparations may be easily made to contain the exact amount of active ingredient in the finished product, and it is hoped that, attention having been called to the matter, this state of things will in future be rectified.

As apparently the use and sale of these important preparations are steadily increasing, and as, in all probability, their adoption will in time become more general, it is important that members of the medical profession especially may depend upon the article being absolutely reliable and of the strength stated, and seeing that the preparations usually met with in commerce vary considerably, it appears to be time that a definite standard of strength should be fixed, and I would suggest that certainly not more than two in each instance should be adopted, viz., the citrate, 3 and 5 grains in each drachm, and the hydrobromate, 1 and 3 grains in each drachm.

In conclusion, I beg to call attention to a sample of effervescent citrate of caffeine sweetened with saccharin instead of sugar, which appears, in many instances, to have distinct advantages over the ordinary kind.

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Mr. **Conroy** said it was very astonishing that there should be such carelessness shown in such a simple preparation. Anyone in the habit of making these things could tell very nearly what they would obtain from a certain quantity of ingredients, and it was easy to add the right amount of caffeine, either hydrobromate or citrate. He did not mean to express any doubt as to the accuracy of the statements, as he thought the method employed admitted of no mistake.

Mr. C. **Symes** (Liverpool) also thought it very extraordinary that there should be such great differences in a preparation in which there was no difficulty in getting comparatively accurate results. If he understood it rightly, one specimen which was labelled 1 grain to a drachm contained 2 grains, and those labelled 2 grains only contained 1 grain, or very little more, and it occurred to him that perhaps some mistake had occurred in labelling the bottles. These preparations were growing much in favour, but there was a tendency to give the dose in teaspoonfuls, which was very indefinite. Not only did the quantity vary with the size of the spoon, but also with the size of the granule, and he was in favour of granular preparations being made very fine, not like citrate of magnesia was usually sent out, as it greatly facilitated accurate measurement.

Mr. **Harrison** asked if blank experiments were made in this investigation. He wished to emphasise the remark made by Mr. Naylor on another question, that without check experiments the value of any such results was much reduced.

Mr. **Ough** said he made a check experiment in each case.

Mr. **Parry** asked what was the advantage of sweetening with saccharin?

Mr. **Bird** said he could quite understand that it would be easy to make variations in the strength of granular preparations if they were made as he had known them sometimes; all the ingredients being put together, quickly cohered into a semi-solid mass, which did not allow much time for the proper mixing of the medicament

Mr. **Ough** (in reply) said most of the samples analysed were taken from the original packages opened by himself. The No. 3 in each instance, which was distinctly labelled 1 grain in one teaspoonful or in 1 drachm, came out nearly 3 grains. He was as much surprised as any one at this result, and repeated the experiment several times. Even then he was not quite satisfied, and sent a sample to a friend, whose figures came out as nearly as possible the same That sample was from a very well known maker. He did not claim any advantage for the use of saccharin, but he was asked by a medical man to make some for experimental purposes, and therefore produced it.

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## The Pharmacy of the Thyroid Gland.

BY EDMUND WHITE, B.SC. (LOND.), F.I.C.

*Pharmaceutist to St. Thomas's Hospital.*

The position of the thyroid gland as an article of materia medica may now be regarded as assured. It behoves us, therefore, as pharmacists, to provide the physician with eligible preparations of this organ which shall possess the desired activity, and also uniformity of strength. I propose to bring before the Conference my experience in this direction, and by way of introduction offer a few general remarks which may be found useful.

Most of the glands employed have been obtained from the sheep, this animal being probably the most generally accessible. Occasionally those of the pig, calf, and other animals have been used, and apparently with an equal measure of success. The processes described in this paper relate entirely to the thyroid of the sheep. The anatomical position of the organ in the neck has already been sufficiently described. I should like here to emphasise one point, namely, that the *two* lobes, although easily separated, are regarded as *one* gland. The thyroid is described as a "ductless gland," its embryonic connection with the alimentary canal being eventually obliterated.

The removal of the gland from the freshly slaughtered animal must be accomplished with certain precautions. If a preparation for hypodermic injection be required the principles of modern surgery must be applied. The hands should be thoroughly cleansed and the knife, scissors, and forceps sterilised by heat or immersion in suitable antiseptic solutions. The excised organ should be immediately transferred to a sterilised wide-mouth stoppered bottle.

For preparations to be administered by the mouth these stringent precautions may be somewhat relaxed, strict cleanliness, in the ordinary sense of the term, being all that is necessary. Direct the slaughterman to cut out the gland with the surrounding tissue without exposing or allowing his knife to touch the gland itself. They can then be trimmed at home, and it will be found most convenient to separate the two lobes. The average weight of each lobe, when trimmed, is about 45 grains. This figure has been obtained by carefully weighing at different times nearly a thousand lobes. It must always be remembered that one is dealing with material liable to rapid putrefaction—hence the glands should be dealt with as soon as possible after removal from the body.

In the absence of any definite knowledge concerning the active principle or principles of the thyroid, the pharmacy of the subject is necessarily rather empirical. Nevertheless we easily obtain preparations which meet the requirements of practical medicine; the refinements will follow when our knowledge is more complete.

The preparations I propose to describe are:—

1. The fresh gland entire given by the mouth.
2. Glycerin extracts (*a*) from fresh glands, (*b*) after treatment with absolute alcohol.
3. Dilute alcohol extract.
4. The precipitate produced by the addition of absolute alcohol to glycerin extract.
5. The dried gland.
6. The precipitate produced by formation of calcium phosphate in glycerin extract.

With regard to the dose required, I have found that one-sixth of a gland, or its equivalent, in a suitably prepared form, daily by the mouth, gives very satisfactory results in myxœdema. For the hypodermic method a glycerin extract has been hitherto employed.

1. *The Fresh Gland Entire Given by the Mouth.*—The portion required for each dose should be finely minced, mixed with wine or other suitable flavouring agent, and swallowed. It has also been given lightly grilled, the object of this treatment being to render the dose savoury and remove the odour and flavour of raw meat.

Patients naturally have some repugnance to this method, which certainly cannot be commended for its elegance or convenience, since each dose entails a visit to the slaughter-house. Its only advantage is to ensure, by giving the whole glandular substance, that the patient shall receive the active principle. Experience has shown, however, that preparations can be easily obtained which possess the desired activity without entailing the necessity of swallowing the structural elements of the tissue.

2. *Glycerin Extract* (*a*) *from Fresh Glands.*—The formula I have employed with uniformly good results is as follows:—

Thyroid glands .................... 6 (12 lobes).
Glycerin } of each ... { ½ fluid ounce, or
Chloroform water } a sufficiency.

Slice the lobes and rub them in a mortar, with one-fourth their weight of fragments of glass, until they are thoroughly disintegrated. Then add half a fluid ounce of glycerin and the same quantity of chloroform water and macerate for twenty-four hours in a wide-mouth stoppered bottle. Express through linen or close muslin, and make the expressed fluid up to twelve fluid drachms by the addition of equal parts of glycerin and chloroform water. Twenty minims of this product are equivalent to one-sixth of a gland.

The chloroform serves the double purpose of a preservative and flavouring agent, and covers very effectually the mawkish odour of the extract. By setting it aside for a few days and then decanting from the deposit its appearance is somewhat improved; or it may be filtered almost bright through paper under pressure. The latter procedure is tedious, but amply repays the trouble it involves. The use of the glass in rubbing down the glands materially reduces labour, though it is not absolutely necessary, and may, perhaps, be thought undesirable.

I have kept this extract in a cool place for two or three months without any apparent decomposition or loss of activity. It is best given to the patient in the form of "drops," since dilution to the form of a "mixture" would render it liable to decomposition in a few days.

It may be sterilised and filtered by means of d'Arsonval's apparatus, which was described in the *Pharm. Journ.*, [3], xxiii., p. 1034. If the extract is intended for administration by the mouth, the trouble and expense involved by this procedure is certainly not repaid by any corresponding improvement in the product.

(*b*) *After Treatment with Absolute Alcohol.*—The glands are sliced thinly and covered with absolute alcohol for four days. They are then taken out, the adherent alcohol being removed as much as possible, and treated exactly as described under glycerin extract (*a*). The object of the preliminary treatment with absolute alcohol is to coagulate colouring matter and proteids, and so obtain a cleaner extract. The product is much more easily filtered, and is almost colourless. This preparation is under trial, and if its activity be proved will be a great improvement, pharmaceutically, on the ordinary glycerin extract.

3. *Dilute Alcohol Extract.*—This is prepared on similar lines to the glycerin extracts, using for each gland half a fluid ounce of 25 per cent. alcohol and making the final product measure six fluid drachms. One fluid drachm is therefore equivalent to one-sixth of a gland. The alcohol very much improves the taste and odour of the product, which, when filtered, is pale red and nearly clear. The sample shown contains 2·68 per cent. of total solids and ·16 per cent. ash, equal to 8·5 grains of extractive matter for each gland employed. I have not yet had sufficient experience with this preparation to speak with certainty as to its activity, but the results hitherto obtained are promising. It is more easily filtered than the glycerin extract and not so sticky.

4. *The Precipitate Produced by the Addition of Absolute Alcohol to the Glycerin Extract.*—One fluid ounce of glycerin extract (*a*) poured into 3 fluid ounces of absolute alcohol yields a precipitate which can be easily filtered out and dried without heat, weighing about 64 grains, 16 grains being equivalent to one gland. This preparation has been found to be active,*

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* See *Deut. med. Woch.*, March 16, 1893.

and is pharmaceutically satisfactory. Its activity compared with an equivalent quantity of glycerin extract I have not yet had an opportunity of determining. I should suggest the addition of sugar of milk to the dry precipitate, so that 3 grains would be equivalent to one-sixth of a gland. The product is a pale grey powder with a very slight odour and taste. If stored in a dry place it would probably keep good a considerable time.

5. *The Dried Gland.*—The glands have been simply dried at a low temperature *in vacuo*, and the dried substances administered by the mouth. I have not employed this method myself. Many objections may be urged against it. It is very difficult to ensure thorough dryness without risking the destruction of the active principle, and if desiccation be not complete, or if moisture gain access to the product afterwards, putrefaction will certainly set in. Moreover, the product is unnecessarily bulky. In fact, the whole idea is inelegant and retrograde.

6. *The Precipitate Produced by Formation of Calcium Phosphate in the Glycerin Extract.*—Dilute 3 fluid ounces of glycerin extract (*a*) with one pint of water, add 55 minims of phosphoric acid, sp. gr. 1·5, and then lime water to neutralisation. The precipitate is allowed to subside, and, after decanting the supernatant fluid, collected on a muslin strainer and subjected to strong pressure to remove the adherent liquor as completely as possible. The pressed mass is then rubbed to a coarse powder and dried at a temperature not exceeding 35° C., or over sulphuric acid. The proportions given yield rather under 18 grains of dry powder to each gland employed. After weighing the product, it is finely powdered and sugar of milk added, so that exactly 18 grains shall be equivalent to one gland.

I was led to devise this apparently somewhat strange method of procedure by the belief that the action of the gland is due to a specific ferment secreted by it,* and the formation of gelatinous precipitates in presence of ferments is a method commonly employed in physiological chemistry for the separation of these bodies from fluids in which they are dissolved.

The composition of the dry precipitate averages 50 per cent. organic matter, 40 per cent. calcium phosphate, and 10 per cent. moisture when dried at 120° C. It is a greyish powder, without taste or odour, and non-hygroscopic. I have kept it over six months without deterioration.

The average amount of organic matter obtained from each gland is 7½ grains. With each 3-grain dose of the finished powder we are therefore giving only a little over 1 grain of material derived from the thyroid, and probably the greater portion of this is inert matter. I propose to apply this method to glycerin extract (*b*), if this be found to be active. It contains very much less organic matter, and we should therefore obtain a more concentrated preparation.

The "thyroid powder" as described above was the first dry permanent preparation introduced into medicine, and it has been used with uniform success in a very large number of cases of myxœdema.

Since it seems probable that the remedy will have to be continued for some time after removal of the urgent symptoms of myxœdema, in order to prevent relapse, I would suggest the admixture of this thyroid powder to the extent of 2 per cent. with ordinary table salt, the mixture to be used by the patient in the ordinary way with food. The mixture is indistinguishable from ordinary salt in taste or odour, and would offer an easy means of supplying the remedy in a continuous and imperceptible manner.

With regard to the organic matter carried down by the calcium phosphate, I am still engaged in investigating it. Up to the present time I have not succeeded in isolating any single substance to which its activity can be referred. I am, however, hopeful of ultimate success, but progress in this direction is very slow, since we are obliged to depend upon clinical results as a means of ascertaining the activity of any given preparation.

In conclusion, I should like to state that I do not profess to have arrived at perfection in the various preparations described. I simply desire to state my experiences, trusting that pharmacists will take up the work and show the medical profession that they are competent to deal with this comparatively new branch of the healing art. By doing so they will not only enhance their reputation, but at the same time retain a considerable business in their own hands which otherwise will inevitably drift into the hands of large manufacturers. I must also add that I consider it subversive to the true interests of pharmacy to apply to any preparation a specific name or title indicating that it is the active principle of the thyroid gland until we really know what the active principle is.

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The **President** said the Conference was much obliged to Mr. White for this paper. It might be a question whether this remedy was likely to come into much practical use, but it was very satisfactory to find that modern pharmacists were equal to the demands made upon them in the case of these new remedies.

Mr. **J. Laidlaw Ewing** said Mr. White had done a great service in bringing forward this paper. He was often asked how long the glycerin preparation would keep, but had not been able to give a satisfactory answer, and should be glad to have any further information on that point. According to his experience the hypodermic extract had fallen into disfavour in Edinburgh, owing to one or two cases of blood poisoning from its use.

Mr. **Gerrard** said this novel branch of materia medica possessed great interest, and he felt sure that the pharmacy of the subject would be much developed in the future. Nothing had been introduced of any importance in the way of what might be called animal materia medica since the days of pepsin and pancreatin until now, and as they were all very much in the dark as to what the active constituent of the thyroid gland was, they could not do more than devote their attention to making galenical preparations which should at least represent the full activity of the drug. There was something attractive, interesting, and mysterious about this article, Mr. White said it might be given slightly grilled, and prove serviceable, and on the other hand he rather objected to the drying of the gland itself; he did not quite see how these two views were to be reconciled. He had been engaged in making preparations of this article, the glands being brought him daily by the butcher. His method was to remove all extraneous matter as far as possible, slice finely, and rub it through a fine sieve of iron wire; it was then scraped off the under side of the sieve, placed on porcelain or glass, and dried at a temperature of about 100°, and at this time of year it would dry very rapidly, if spread thinly; when dried it could be pulverised, and in that condition it was fully active, but he could not claim that it was an elegant preparation. It might be diluted with sugar of milk or phosphate of calcium. He must emphasise the importance of drying it rapidly, as if left too long it decomposed quickly, and changed into a peculiar black substance. He believed almost any quantity of thyroid gland could be taken without producing deleterious effects; at any rate he had some experience of this as far as the lower animals were concerned, for on one occasion a friend called to see him, bringing a dog with him, and there being a number of glands lying on a bench, the dog smelt them out, and ate them. It would be interesting to know whether the active principle was a proteid; he took it from Mr. White's results that it was not, but he should like to hear Mr. White's opinion; if it were, alcohol would not dissolve it, and therefore an alcoholic solution would not be efficacious. At first he thought it must turn out to be one of those active proteids of the albumose class, but Mr. White's experiments indicated differently. He should be pleased to find that an active preparation could be made with weak alcohol, as it would put into the hands of every pharmacist the means of making his own preparation of this very useful substance.

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* *Brit. Med. Journ.*, Feb. 11, 1893, p. 289.

Mr. C. Symes said the introduction of this preparation and that of another fluid prepared from the testicle of the calf almost made one doubt whether the old practitioners who used to prescribe dried serpents, snails, and so on, were so stupid after all. There seemed a tendency of late to revert to the ancient style of pharmacy. He had had some experience in this matter, and could not agree with Mr. Ewing that hypodermic preparations of the gland were falling into disuse, and introduction by the mouth substituted. He had sent out some dozens of tubes for hypodermic use, and had never heard of any unfavourable result. In each case they were very carefully prepared, the glands being obtained from the slaughter-house by a medical man, and every precaution was taken to prevent contamination of any kind. In one case a lady, who was deriving considerable benefit from the hypodermic injection, wished to take it in another form, and some compressed tablets of the dried material were obtained, but they failed to produce the same effect, and the patient went back to the injection.

Mr. Rait said two medical men in the West of Glasgow had been using this preparation, and found that abscesses formed as the result of subcutaneous injection, and they were of opinion that large doses did not suit. There was one case of a lady who was under treatment for two months with marked success, but very small doses were given.

Mr. Harrison said he noticed that Mr. White took the gland as his unit of measurement, both with regard to the dose and strength of these preparations, not any definite weight. It occurred to him that the glands would probably vary a great deal in size, and whatever the active principle might be, that a large gland would presumably contain more than a small one; and if that were so, the glycerin and other preparations would vary in strength accordingly.

Mr. J. Rutherford Hill said, as far as he could gather, this article was not a cure, but rather a palliative, the patient going back again if the use of the drug was discontinued, so that the remedy had to be taken constantly. That being so, he doubted whether any preparation containing glycerin was an advisable one to use, because it had been found again and again that for some reason, which he did not understand, the use of glycerin after a short time induced a feeling of revulsion in the patient, and it became so nauseous that they would absolutely refuse to take the medicine which contained it. In this case, any preparation to be taken by the mouth should be one which could be continued for an indefinite time without producing disgust. He was not sure that mixing it with salt and taking it along with the ordinary dietary would not be the best form of administration. In Edinburgh the glands themselves in a kind of half-cooked condition were given, and with good results. The only cases in which this remedy seemed to have had a permanent curative effect were those of young growing people, who perhaps were suffering from some functional disturbance which only needed to be removed to enable the system to throw off the disease. In the case of myxœdema it only seemed to be a palliative, and must be continued indefinitely; it was therefore a question whether the admixture with calcium phosphate might not give rise to the possible danger of calculus.

Mr. W. H. Symons said there was another point also to be borne in mind. The thyroid gland was known to contain many products similar to uric acid, and it had recently been pointed out that persons taking this remedy had suffered from uric acidæmia. It struck him that this might be to a large extent avoided if it were found that the preparations previously treated with alcohol were equally effective in treating myxœdema. He did not know whether Mr. White's experiments enabled him to say what the alcohol removed from the gland, and they had yet to discover to what the thyroid gland owed its activity, but if the waste products could be thus removed without injury to the remainder, so much the better.

Mr. White, in reply, said he had proved that the extract made with chloroform water could be kept for several months without any change, provided you had a well stoppered bottle which prevented the evaporation of the chloroform, otherwise it would go wrong. The great point was to have the glands perfectly fresh, and have the most thorough cleanliness. He could endorse what had been said about the hypodermic solution; it was a great worry, and he should advise pharmacists to steer as clear of it as possible. Dr. Symes said he had had no trouble, but that might seem simply that he had not heard of any complaints. In nearly all cases it produced a number of little lumps at the point of injection, and occasionally abscesses. Satisfactory results could only be ensured by very great and constant care, and by making the extract fresh as wanted. For administration by the mouth, one could make a two months' supply at once, but for hypodermic use he should not like to employ anything more than a week old. The apparent contradiction to which Mr. Gerrard referred was apparent only. When the glands were slightly grilled it only affected the outside, and gave a savoury odour and taste, but the interior was hardly warmed; if they were thoroughly cooked he had no doubt they would be quite inactive. Mr. Gerrard was in error also in his remark as to the perfect harmlessness of this organ. Several fatal cases had occurred from overdoses, and the analogy between the dog and the human subject must not be carried too far. Overdoses had a very bad effect, especially if exercise were taken immediately afterwards. The gastric juice of the dog was very strongly acid, and that acidity might possibly destroy the active principle of the gland. What the active principle really was, still remained matter for speculation. He held that it was a ferment, for the following reasons:—the structure of the organ was typically glandular; at one time it was connected with the alimentary canal much in the same way as the pancreas or liver, and there was every reason to suppose that it had a somewhat similar function. The only difference between it and the pancreas was that the duct was eventually cut off from the alimentary canal, and the secretion, instead of getting thus into the canal, reached the blood in some other way, probably through the lymphatic system. It might be a proteid, or it might not, and that raised the question whether alcoholic preparations would be active or not. He had employed dilute alcohol, and if it were a ferment the dilute alcohol would probably extract a considerable amount; otherwise pepsin wine would be inactive. He used 25 per cent. absolute alcohol, which was equivalent to about 20 per cent. when diluted with the juices of the gland. He thought the remark of Mr. Symes about the old practitioners' use of snakes and toads was scarcely apropos, since modern developments in this line were strictly based on physiological facts. One knew that removal or injury of the thyroid gland was followed by symptoms very similar to those of myxœdema, and that suggested the application of this remedy. It was not a case of merely hitting on it by accident, but the practice of their forefathers was not dictated by any such reasoning. He had met with several instances where tabloids had been inactive, but had put it down to carelessness probably in the drying; and that was one great objection to using the dried glands. With regard to taking the lobe as the standard for the dose, he might say that two sheep of the same weight would often have glands of very different size, perhaps twice as large in one case as in another; but those with the small glands seemed to live as satisfactory lives, and it seemed reasonable to suppose that the smaller gland might be of higher activity. As the active principle was not known one could not give precision to the dose. One seldom worked on one or two lobes only, probably on two or three dozen, and thus an average result was got, which was more satisfactory than taking the dosage by the actual weight of the gland itself. With regard to the permanent effects of this remedy, he had seen many cases which might be regarded as cures, with the reservation that the remedy must be continued, but naturally the degree of relief depended very much on the age of the patient. A young person naturally recovered more quickly, but in practically all the cases he had seen a complete cure was effected. The objection to the use of glycerin as a menstruum must be a little qualified by the fact that it was only necessary to give 5 minims a week of the glycerin extract after the cure had been effected, and a stomach must be very sensitive indeed which could not tolerate that. The same remark applied to the objection to calcium phosphate with common salt: taking 2 per cent. of calcium phosphate one would be taking only from 4 to 6 grains per week, and most people took a much larger amount than that in their ordinary food. Mr. Symons had referred to the advantages of the alcoholic preparation if effective, and no doubt that was correct. It was nice and clean, free from blood, and contained very little organic matter. If it proved active it would confirm his opinion that the active principle was a ferment; pure strong glycerin dissolved out very little proteid matter indeed after treatment with absolute alcohol.

Mr. **Currie** asked if the efficacy of this agent depended at all on the age of the sheep, and suggested that it would be very desirable to have clear evidence as to the health of the animal, or evil results might follow.

Mr. **White** said he could not offer any suggestion as to age, but naturally one would not expect to find very old sheep at a respectable butcher's. There must always be a certain amount of risk about the health of the sheep; it would be nice to have a veterinary surgeon's certificate in each case, but it hardly seemed practicable, and he had never heard of a case of disease being communicated. But this consideration made it more desirable still to use an alcoholic extract rather than the gland itself. In the latter case you would be sure to give the disease, if it were there, as well as the active principle, but if the gland were treated with absolute alcohol, and then dried and extracted with pure glycerin, there was a chance of excluding the diseased matter.

(*To be continued.*)

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*Errata.*—On page 171, column 2, line 3, of last week's Journal, for *paracotoin* read *paracoto bark*, and on page 179, column 1, substitute for line 8 from bottom, the words "atropic acid, which at once formed atropate of atropine." These corrections were received from the authors of papers too late for insertion last week.

# American Pharmaceutical Association.

## INAUGURAL ADDRESS AT THE CHICAGO MEETING.

BY JOSEPH P. REMINGTON, PH.M., PRESIDENT.

Fellow members of the American Pharmaceutical Association,—For the second time in the forty-one years' existence of this body, the place of meeting which has been chosen is the city of Chicago. The present meeting has been projected, and some of the details arranged in advance, for a longer period than ever before in the history of the Association, the great moving cause for which has been the assembling in this city of the nations of the world to do honour to that courageous, intrepid navigator who opened up to civilisation the New World, and to whose memory every American owes a lasting debt of gratitude.

In accordance with the provisions of the bye-laws of this body, it becomes my duty to address you upon events which are of special interest to the Association, and first must come the duty to welcome our guests, the members of the Seventh International Congress, whom you have invited to meet with us, and who are to organise in a few days the first International Congress held in America. We have also present upon this occasion, for the first time, delegates from that representative national body, the American Medical Association, and their presence adds much weight to the belief, which is fast gaining ground in America, that the relations of the professions of medicine and pharmacy are rapidly developing towards that point which has been in times past so earnestly sought for, when both may meet on common ground and labour together to mutual advantage. It has been three years since the American Medical Association first invited this Association to send twenty-five delegates to its annual meeting at Washington. This invitation has been repeated annually, and a section of materia medica and pharmacy has been organised by them. Our delegates have communicated papers to this section, and have been urged to engage in the subjects for discussion; this invitation has always been accepted. Every courtesy has been shown them, and the utmost freedom of action consistent with the attainment of mutual benefit has been accorded. This much having been accomplished, it becomes an important question whether the time has not arrived, and the way paved, for the formation of a joint body or commission, organised on a scale commensurate with its importance, which shall be charged with the duty of developing to the utmost such lines of labour or scientific research which shall improve our Pharmacopœia, propose plans for reforming abuses, and strengthen the hands of those who are endeavouring to secure needed and proper legislation for restricting the practice of medicine and pharmacy to those only who are qualified to perform such responsible duties. In 1860, out of nine members of the committee of revision, we find the names of six of our members; in 1870, the Committee was enlarged to fifteen, and eight of the number elected were members of this Association; in 1880, of the twenty-five selected, fifteen of our members were chosen; and, finally, in 1890, of the twenty-six forming the Committee, sixteen were members of this Association.

### *The New Pharmacopœia.*

In this connection, as one of the events of this year, the advent of the new Pharmacopœia is just announced, and I know that I voice the sentiment of this Association when, on your behalf, I tender to the Committee of revision and publication of the Pharmacopœia of the United States of America your most hearty congratulations upon the completion of their labours. The Chairman of the Committee, Dr. Charles Rice, will present at this meeting, for your inspection, the first copy of the latest revision which has issued from the press, and although the ink is now scarcely dry upon its pages, even a slight perusal of its contents will convince the reader that the labours of the Committee have been arduous, while those of the talented Chairman have been herculean.

Since the work will now be soon sent broadcast over the land, it will be appropriate for me to make you acquainted with some of its prominent features. For the first time in its history, the United States Pharmacopœia is sent forth solely under the ownership and control of its Committee of publication, publishers and bookmakers being employed by them, under legal contracts to issue it in accordance with approved mercantile usages.

The price of the book, considering its increased size, is just one half that of the former Pharmacopœia; this must of necessity secure the widest possible distribution. It is proposed that the income, after deducting necessary expenses, be devoted in the future to conducting researches which will be of service in subsequent revisions of the work, and redound to the credit of American pharmacy.

In glancing through its pages, the first striking change that will be noticed is the introduction of the principle of solids by weight and liquids by measure, instead of that of "parts by weight" of the former Pharmacopœia, the metric system being adopted in order to express this principle in the most rational and simple manner, for in no other system of weights and measures is the commensurability of the units so easily effected. It is believed that the radical change in weights and measures will ultimately result in great benefit to pharmacy.

Three years have elapsed since the National Convention at Washington directed the Committee to adopt the metric system. This fact has been widely published and commented upon. In addition, upon the title page of the new Pharmacopœia will be seen the line, "official after January 1st, 1894," and the issue of the book at this time will permit it to be in the hands of every pharmacist for a considerable period before it is expected to go actually into force, so that it cannot be said that the pharmaceutical profession is entirely unprepared for a change which was inevitable.

The subject of standardisation, which became such a burning question at the time of the meeting of the Convention, has been settled by the Committee in the only way possible. Much careful investigation resulted in the members reaching the unanimous conclusion that reliable methods of assay, resulting in approximately uniform results, when carried out by different operators, and permitting a strict identification of the products, are available at present for only a few drugs, and opium, cinchona, and nux vomica have been selected. The introduction of assay processes which are in the least open to question strikes at the "authority of the authority," and destroys the usefulness of a standard.

The revision of the tests and descriptions of the chemicals has been thorough and laborious. Volumetric methods supplant former gravimetric ones, whenever possible, thus rendering analyses by the pharmacist more practicable, by reducing the examinations of medicinal chemicals to the simplest and most rapid methods consistent with accuracy.

In establishing limits for the purity of these substances good judgment must always be used. If the contaminating substance does not alter the therapeutic action of the chemical, but merely dilutes it to a trifling degree, then the Pharmacopœia, by a reliable test, limits the extent of such dilution, so that accurate medication is possible; if, on the other hand, the contamination changes the therapeutic properties of the body, no consideration of cost should interfere with the establishment of a standard for purity which will exclude all such contaminations, thus enabling the physician to place absolute dependence upon the action of that remedy.

The subject of nomenclature, always an important one in pharmacopœial revision, was one of unusual interest in the present work. So-called reforms have been periodically started, and many ambitious projects have come to nought, mainly because of their impracticability, or lack of sufficient usefulness to warrant the abandonment of the names already in constant and familiar use. In selecting pharmacopœial names, the guiding principle, of the greatest brevity consistent with accuracy, is of the utmost importance.

The prevailing custom of our modern chemists of expressing the complete constitution of the carbon compounds by using the names either in whole or part of its constituents is in most respects a capital one, but it has its limitations for pharmacopœial purposes. Such names have been relegated, whenever it is necessary to use them at all, to the synonym list.

On the other hand, the arguments had little force of those chemists who are labouring earnestly to phoneticise chemical nomenclature by urging the adoption of the spelling of "oxide," "bromide," "chloride," etc., without the final "e;" who seek to destroy the prevailing distinctions between the names of alkaloids, glucosides, and neutral principles; and insist upon having their "sulphur, phosphorus, and phosphate' curtailed to "sulfur, fosforus, and fosfate."

The use of trade or proprietary names in the Pharmacopœia has, of course, been avoided, and such substances as have earned a place in the work through their extensive use have been given names which are expressive and suitable. But the important change in chemical nomenclature in the new Pharmacopœia which it is believed will commend itself to all, and which has been in practical use by most chemists, is the dropping of the word "of" in designating chemical compounds, and then transferring the metallic or basylous component to the first place. "Sulphate of sodium" thus becomes "sodium sulphate. The salts of mercury, iron, and manganese, etc., have been differentiated, and the higher and lower forms are now rendered with the "ic" and "ous" terminations, thus we have ferric and ferrous sulphates, mercuric and mercurous chlorides, etc.

In the botanical nomenclature quite a large number of changes will be noticed. These are mostly in accord with the views of the Botanical Club of the American Association for the Advancement of Science, and while many of the changes are radical, it must be admitted that the guiding principle of priority, as clearly established and based on correct identification, constitutes the most rational basis for reforms in botanical nomenclature.

In pharmacy it is believed that the new book will show evidences of progress, and prove a good representative of the solid achievements of the past decade.

The process of percolation, which, as is well known, has been the subject of especial study in this country, will receive an additional impetus on account of a wider application of its principles than ever before. Discrimination, of course, has been manifested, and in a few instances, where the physical structure of the drug rendered percolation impracticable, maceration has been preferred.

The important classes of liquid galenicals, the fluid extracts and tinctures, have had important additions to their number. In nomenclature a new class, "Emulsa," has been created, and some of the former "mixtures" placed in it, and it is hoped that before another revision pharmacy will have advanced to such a degree that we may have accurate definitions of the various classes of preparations, for it must be universally admitted that no science can progress satisfactorily until the important subject of nomenclature rests upon a lasting and accurate foundation, and these views are recognised to day, as they have never been before, not only in chemistry and botany, but in every branch of science known to man.

I is too much to expect that the book will escape criticism, but it is not too much to expect the fair treatment that it deserves. It represents the combined views of men having varied talents and environments in the professions of medicine and pharmacy. The needs of the different sections of our vast country have been heeded and conscientiously weighed. The results which have been reached reflect the earnest and careful attention of impartial judges.

This cardinal principle in revising an authority has not been lost sight of, that if a pharmacopœia is to be truly representative of a nation's advancement in the sciences which form the foundation of pharmacy, no narrow interpretation of the needs of the various sections of the country must be suffered to guide its authors; the book must stand for the whole country, and be equally acceptable in every state, from Canada to California, and from Florida to Alaska.

The issue of the Pharmacopœia will doubtless lead to the revision of our National Formulary, and there is every prospect that this work will prove, when published, of even greater value than the one which is now in use, and based on the Pharmacopœia of 1880. The publication of this little book grew out of a need for an authoritative guide to pharmacists in preparing unofficial remedies; it has had an unusually successful career. The report which will be presented at this meeting will show that a large number of copies have been sold and distributed; the cost to the pharmacist has been trifling, the utmost liberality in permitting republication, abstracts, etc., has been shown, and notwithstanding the low price and small margin on the cost of manufacturing, there will remain in our treasury the substantial profit of 3000 dollars. There is no good reason why these results cannot be materially increased in the next edition, if, in addition, the name be changed to the "American Formulary," issued by the authority of the American Pharmaceutical Association.

### *Progress in Science and Pharmacy.*

Applied chemistry is now calling large numbers to her allegiance; for us, as pharmacists, analysis must for ever be the favourite study, for the selection and testing of medicines are most important duties. The last year has witnessed a still greater development in chemical research, and, as in electrical science, it is entirely beyond human ken to foretell the possibilities of the future. Organic chemistry to-day unquestionably embraces a greater number of observed and recorded phenomena than any other science. Our chemical journals come to us teeming with facts, inventions, and discoveries, which tax the minds of the most noting and erudite to even glance through and note. One must be exceptionally gifted with mental endowments to be able to state, even in meagre outline, the present status of this branch of science. The accumulation of facts which underlie the massive structure has been rendered possible, solely through the development of "specialism." All must have realised that the great need of the hour is for the calling into life some great generalising, comprehensive intellect, with a power of grasping these facts, and arranging and classifying them in an orderly and systematic manner. Let us not cease to hope for this grand master mind, who will ultimately accomplish for the modern organic chemistry of our day what Cuvier and Linnæus in their age did for the branches of science with which their names will be for ever indissolubly linked.

The effect upon pharmacy and medicine of this extraordinary activity in the synthetical departments of chemical science has been profound. New chemical compounds and new classes of compounds have been flooding commerce like a deluge, the more valuable ones being protected by letters patent or by copyright names. It might be supposed that the Pharmacopœia would accept remedies of this class, but the Convention in 1890 clearly defined its position as follows:—In article 3 of the General Principles, "No medicinal substance which cannot be produced otherwise than under a patented process, or which is protected by proprietary right, shall be introduced into the Pharmacopœia." It is clear that any substance which is controlled by one manufacturer or corporation "becomes law unto itself," and any test, limitation, or standard of purity established by the Pharmacopœia could be rendered nugatory at the whim of the manufacturer if it suited his purpose, whilst the Pharmacopœia would stultify itself by admitting a substance under certain impurity limitations, if it was found subsequently that the only substance that could be obtained in the market was one which deviated from the standard established. Whenever the production of the substance is solely under the control of one person, firm, or corporation, and it is impossible to compel the manufacture of a preparation conforming to the official standard, there is but one course to pursue, namely, that of exclusion.

It has not been deemed necessary in this address to bring forward at this time for your consideration a new plan for the control of the sale of various medicinal preparations which have long been sold by druggists, but which have either shaken their allegiance to the apothecary or have been badly appropriated by merchants in other vocations, who have for years cast longing eyes upon the much talked of profits from their sale.

It would seem to accord with the universal "fitness of things" to assert that the proper man to sell medicines is the medicine man, and it is surely in the interest of the commonweal to have their sale controlled by educated and specially trained dispensers of remedies, which remedies are often dangerous in the hands of the inexperienced. But it must not be forgotten that all commodities (medicines not excepted) will be bought and sold in commerce according to the laws of trade, and all efforts to limit the sale of such commodities must be framed in obedience to those well known laws. The wisdom of our commercial section can be trusted to pilot the Association in a safe course in these troublous waters. The sections of scientific papers, education, and legislation, will prove interesting and full of instruction to all our members, and without anticipating any of their work it may be safely premised that the papers which will be read, and the discussions to be entered upon, will be of absorbing interest.

Finally, your presiding officer desires to ask for your indulgence in the transaction of the business which is to come before us. He trusts that the forbearance and the kind consideration which have always characterised the meetings of the American Pharmaceutical Association may not be withheld, and it is with the sincere desire that every member may realise to the utmost every anticipation, and that, when the hour of adjournment is reached, it may be with hearts full of satisfaction, this welcome verdict may be reached: "It has been the best meeting in our history."

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Copies of the following newspapers, with marked paragraphs, have been received:—*Stalybridge Herald*, *Worcester Daily Times*.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Attfield, Bolton, Grose, Knowles, Naylor, Rice.

## PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

### SEVENTH DECENNIAL REVISION, 1890.

The new issue of this work, which has just been published by the Committee of revision appointed by the National Convention in 1890, is in its general character and arrangement analagous to the one of 1880, but the volume contains 122 pages more than that. Of this additional space eight pages are taken up with prefatory matter, and twenty-five pages with descriptions of reagents, test solutions, and tables, seventy five pages with descriptions of official articles, and fourteen pages with the extension of the index.

The historical introduction is a reprint of that appearing in the sixth revision, supplemented by a record of the proceedings of the Convention of 1880, and of the provision made for the Convention of 1890, under whose authority the present pharmacopœia has been issued. There is also appended a very interesting footnote, giving an account of the earlier attempts to produce a pharmacopœia suited for American requirements previously to the carrying out of the project for the formation of a national pharmacopœia according to the plan suggested by Dr. Lyman Spalding in 1817.

The proceedings of the National Convention summoned by Dr. Robert Amory in May, 1890, are then recorded, together with the appointment of the Committee of revision and publication, the resolutions that were adopted in regard to the general principles to be followed in revising the pharmacopœia, and as to the basis of representation to be observed in the future Convention of 1900. The Committee of revision as organised after its appointment consisted of the following members:—

Charles Rice, Ph.D., New York, N.Y. Chairman.

Joseph P. Remington, Ph.M., Philadelphia, Pa. First Vice-Chairman.

Robert T. Edes, M.D., Jamaica Plain, Mass. Second Vice-Chairman.

Charles O. Curtman, Ph.G., M.D., St. Louis, Mo. Third Vice-Chairman.

Frederick A. Castle, M.D., New York, N.Y. Secretary.

James M. Flint, M.D., Washington, D.C. Treasurer.

Roberts Bartholow, M.D., LL.D., Philadelphia, Pa.
*P. Wendover Bedford, Ph.G., New York, N.Y.
N. S. Davis, Jr., M.D., Chicago, Ill.
C. Lewis Diehl, Ph.M., Louisville, Ky.
Robert G. Eccles, M.D., Brooklyn, N.Y.
John Godfrey, M.D., Stapleton, N.Y.
Willis G. Gregory, Ph.G., M.D., Buffalo, N.Y.
C. S. N. Hallberg, Ph.G., Chicago, Ill.
John M. Maisch, Ph.M., Ph.D., Philadelphia, Pa.
George F. H. Markoe, Ph.G., A.M., Boston, Mass.
William M. Mew, M.D., Washington, D.C.
Charles Mohr, Mobile, Ala.
Oscar Oldberg, Ph.D., Chicago, Ill.
Frederick B. Power, Ph.D., Passaic, N.J.
Henry H. Rusby, M.D., New York, N.Y.
Lucius E. Sayre, Ph.G., Lawrence, Kan.
Alfred B. Taylor, A.M., Ph.M., Philadelphia, Pa.
Otto A. Wall, Ph.G., M.D., St. Louis, Mo.
Horatio C. Wood, M.D., LL.D., Philadelphia, Pa.
*Thomas F. Wood, M.D., Wilmington, N.C.

During the past year the Committee lost two of its members by death, their names being marked by asterisks in the foregoing list. The work of revision was carried on in the usual manner, and continued up to the time of going to press, a number of the questions arising being submitted to medical experts for advice. One of the subjects brought prominently before the Committee was the proposal to establish for various galenical preparations a fixed proportion of the active principles of the more potent drugs which admit of being assayed, and a sub-committee was charged with the investigation of processes which have been proposed for that purpose. The unanimous conclusion arrived at was that trustworthy methods of assay, resulting in approximately uniform results and permitting of strict identification of the products obtained, are at the present time available for only a few drugs. Having regard, moreover, to the fact that pharmacopœia requirements and assay processes are liable to be made the basis of legal prosecution by officials charged with the administration of the laws relating to adulteration, it was thought that much injury might result from the official introduction of methods which have not been generally proved to be trustworthy. Hence the adoption of a general system of standardisation was abandoned and, except in the case of preparations of cinchona, nux vomica, and opium, the problem of standardisation has been left open until further study of it may furnish a sounder basis for fixing and determining the strength of preparations. For the same reasons it has been deemed unadvisable to add to the descriptions or definitions of other drugs than those above named any statements as to the average amount of their active constituents.

In regard to the description of chemical substances and the tests applicable to them particular care has been taken to consider the limitation of impurities in commercial products, and in no instance to impose requirements more rigorous than manufacturers can readily comply with under ordinary conditions of cost. In the tests prescribed the volumetric method has been adopted as far as possible in preference to the gravimetric method, as being more simple and expeditious.

The list of reagents has been prepared upon the supposition that those making use of it will possess an elementary knowledge of chemical analysis; but explanatory remarks and instructions as to details of manipulation are given more fully than in most other pharmacopœias, with the object of rendering reference to other works unnecessary. In the chemical formulæ the old notation has been abandoned and those atomic weights adopted which are most in harmony with the general practice of chemists. Attention has been given to the efforts now being made to reform chemical nomenclature so as to render it more uniformly systematic and make the name of a substance convey information as to its nature and constitution; but on consideration it was felt that the progress made towards those ends is still too slight to justify the introduction of radical changes in the names of medicinal substances.

The prominence given to the subjects of testing and the preparation of reagents for that purpose, is a very noticeable feature of the present Pharmacopœia. It may be regarded as evidence of a desire to promote among pharmacists an individual activity complementary to that formerly exercised in the preparation of chemical as well as pharmaceutical products. The omission from the Pharmacopœia, at the previous revision, of processes for the preparation of such articles of the materia medica was a fitting acquiescence with altered conditions which cannot be ignored, though they may at first sight appear calculated to place the pharmacist at some disadvantage in his relation to the public. But it is not necessary that such should be the case. A glance at the carefully defined tests given in the new Pharmacopœia of the United States, for the purpose of identifying drugs, chemical products, and galenical preparations, and ascertaining their quality, will be sufficient to show that there is an ample field for the competent and conscientious pharmacist to preserve himself from falling into the herd of mere "hewers of wood and drawers of water," who can give no reason for claiming from the public preferential consideration. There is now even a more substantial basis than ever for pharmacists to furnish individual guarantee of the medicinal articles which it is their particular business to supply, and as to the nature, quality, and accurate preparation of which the purchasing public is unable to judge. By the cultivation of that faculty and by its constant exercise the practice of pharmacy may continue to command the confidence of the intelligent public, and its followers may succeed in extending the conviction that there is a wide difference between trading in ordinary commodities and the supply of medicinal preparations—between the drug store and the pharmacy.

We take it to be under the influence ot some such views as above stated that the Committee of revision has devoted so much care to the section on reagents, and has so largely extended the directions as to testing the majority of the articles comprised in the official materia medica. The number of reagents is now increased to 116. In place of the six volumetric test solutions in the sixth edition, there are now seventeen. The instructions given for the preparation and use of these solutions and of the general reagents inspire the idea that they are intended to be made frequent use of. The information given is expressed in simple but definite language, with an evident desire to instruct that cannot fail to be appreciated by and useful to willing students. The range of the analytical work falling within the province of the practical pharmacist is defined, in regard to volumetric operations, by an excellent table (pp. 504–508) that will be found very useful. Brief descriptions are also given of the method of performing gasometric operations, of the extraction of alkaloids by means of "shaking out" with immiscible differential solvents, and lastly of the use of the polarimeter for distinguishing between essential oils, and for other purposes of identification.

To facilitate analytical work of the kind above referred to, a number of very useful tables are furnished, giving the atomic weights of elementary substances, the formulæ and molecular weights of compounds that are official articles, reagents, or products of analytical operations; other tables give multiples of atomic and molecular weights in frequent use, thermometric equivalents, the relation between specific gravity and contents of alcohol, and various acids and alkalies, and the saturation equivalents of different acids and bases.

In addition to the Latin and English official names of drugs, chemicals, and preparations, synonyms are sometimes inserted. Among galenicals, "laudanum" and "paregoric" are given for the first time, in accordance with the British Pharmacopœia. Where changes have been made in the official names, the names used in the Pharmacopœia of 1880 are appended in brackets. The alteration of chemical names, by which "sodium sulphate" is substituted for "sulphate of sodium," has not been extended to the corresponding Latin names, so that there is a uniform want of grammatical harmony between the two names; but this is perhaps less objectionable than the somewhat awkward Latin names of the German Arzneibuch.

In botanical nomenclature it has been decided to follow the rules adopted in 1892 by the Botanical Club of the American Association for the Advancement of Science, viz.:—

I. That, with some few exceptions, the nomenclature in the Paris code of 1867 shall be followed.

II. That the limitations of genera given in Bentham and Hooker's 'Genera Plantarum' shall be followed, except where an obvious error is involved.

III. That in species limitations those authors should be followed whose views appear to us correct.

As in the previous edition of the Pharmacopœia, species names are printed with a small initial letter, except—

1. When the name itself has been a genus name.
2. When it is derived from the name of a person.
3. When it is an indeclinable noun or a combination of noun and adjective.

Genus and species names are printed in type different from the name of the authority, and this, contrary to the usual practice, is in all instances given at full length.

The authority given by the Convention to make tinctures of a uniform strength of ten per cent. was not acted upon, for the reason that it was feared more harm than good would be done by the change. In regard to the contemplated introduction of a class of 50 per cent. liquid preparations of vegetable drugs or 50 per cent. fluid extracts, a special sub-committee was charged to investigate the subject, and it was eventually decided that though such preparations might be made, in the case of some drugs, that is not practicable in other instances without complicating the process. An attempt was made, in accordance with a recommendation of the Convention, to introduce general formulæ for the preparation of fluid extracts and tinctures, as in the case of triturations and tinctures of fresh herbs; but upon trial of the plan it was given up as being much less convenient than the present arrangement.

The adoption of the metric system of weights and measures is a most important step of progress.

In pursuance of the authority given by the Convention, the publication of the Pharmacopœia has now been undertaken by the Committee of revision at its own expense, so that it remains subject to its exclusive control and ownership. In order to secure a more general adoption of the reference to any particular edition of the Pharmacopœia by designating the year in which its publication was authorised by a Convention, the year 1890 has in this issue been printed on the title page. Each authentic copy of the Pharmacopœia 1890 has attached to the back of the title page a coupon upon which are printed a serial letter and a number with the words "Pharmacopœia of the United States of America. Seventh Decennial Revision (1890). Official Copy. Copyright." Throughout the work the word "official" has been used in the place of the word "officinal." That change was made by a special vote of the Committee in 1890 as being justified by the general recognition of the word "official" as synonymous with "pharmacopœial," and also by the adoption of the Pharmacopœia as a standard authority by the Government of the United States and by a number of the States.

In the preliminary notices under the definition of the different fineness of powders the terms expressing the number of meshes to a linear inch have been supplemented by corresponding values in terms of metric measures, but it has not been deemed advisable to substitute these for those at present in use.

Under the head of percolation the directions given are substantially the same as in the Pharmacopœia of 1880, but, in addition, it is stated that the shape of a percolator should be adapted to the nature of the drug operated upon. For those apt to swell a conical percolator is recommended, particularly when the menstruum used is aqueous or feebly alcoholic, while a cylindrical percolator is to be employed for drugs which are not liable to swell, and when the menstruum used is strongly alcoholic a volatile liquid, such as ether, is used for extraction.

To preserve solid extracts in a plastic condition suitable for making pills, etc., the incorporation of 10 per cent. of glycerin by weight is recommended.

The directions relating to specific gravity and temperatures are the same as in the Pharmacopœia of 1880.

Under the head of weights and measures it is stated that the value of the United States national prototype standard metre and kilogramme are identical with those of the International standard metre and kilogramme derived from the mètre des archives and the kilogrammes des archives. The actual litre is defined as the volume of one kilogramme of pure water at the temperature of its maximum density *in vacuo*, the litre being theoretically equal to one cubic decimetre or 1000 cubic centimetres. The relations of the United States yard, pound, and gallon to the corresponding metric measures are also given, and at the end of the volume there are seven pages of tables giving equivalents of metric weights and measures and those in customary use, and of the relations of weight to measure, ranging from the metric equivalent of one minim up to 1000 grammes, also from the troy ounce to the equivalent in grains of one minim of water at 4° C., and this table gives the metric equivalents of weights from five grains down to $\frac{1}{840}$ of a grain. The tables of equivalents of measures of length give the equivalents in inches from 150 to 1 centimetre, and the equivalents in millimetres from 1 inch to 0·0039 inch.

The actual number of articles included in the new Pharmacopœia (994) is but little different from that of the previous edition (997). Very considerable changes have, however, been made by omission and by addition of new articles.

The omissions comprise the following crude drugs, etc.:—

Aurantii flores.
Azedarach.
Cannabis Americana.
Cinchona flava.
Cornus (*Dogwood*).
Cydonium.
Fel Bovis inspissatum.
Galbanum.
Gaultheria.
Gutta-percha.
Ignatia.
Juniperus.
Lavandula.
Magnolia.
Maltum.
Oleum lavendulæ.
Oleum rutæ.
Oleum succini.
Oleum valerianæ.
Origanum.
Pix canadensis.
Prinos (*Black alder*).
Rosmarinus.
Salix.
Thuja.
Ustilago (*Corn Smut*).
Viola tricolor.

The chemicals omitted are—

Æther (74 per cent.).
Ammonii phosphas.
Ammonii sulphas.
Amylum iodatum.
Chinoidinum.
Chloroformum venale.
Cupri acetas.
Ferri oxalas.
Hydrargyri sulphidum rubrum.
Magnesii sulphis.
Potassii sulphis.
Potassii tartras.
Sodii bicarbonas venalis.
Sodii santoninas.

The galenicals omitted are—

The whole of the eleven abstracts.
Acetum lobeliæ.
Acetum sanguinariæ.
Ceratum extracti cantharidis.
Ceratum sabinæ.
Charta cantharidis.
Elixir aurantii.
Emplastrum ammoniaci.
Emplastrum asafœtidæ.
Emplastrum galbani.
Emplastrum picis canadensis.
Extractum cornus fluidum.
Extractum lactucarii fluidum.
Extractum malti.
Extractum mezerei.
Infusum brayeræ.
Linimentum cantharidis.
Linimentum plumbi subacetatis.
Liquor ferri et quininæ citratis.
Liquor gutta-perchæ.
Liquor pepsini.
Mist. magnesiæ et asafœtidæ.
Mist. potassii citratis.
Mucilago cydonii.
Pilulæ ferri compositæ.
Pilulæ galbani compositæ.
Spiritus odoratus.
Syrupus ferri bromidi.

Syrupus limonis.
Tinctura conii.
Tinctura ferri acetatis.
Tinctura ignatiæ.
Trochisi magnesiæ.
Trochisi sodii santoninatis.
Unguentum acidi gallici.
Unguentum mezerei.
Unguentum sulphuris alkalinum.
Vinum album fortius.
Vinum aloes.
Vinum aromaticum.
Vinum rhei.

The additions to the crude drugs, etc., in the present edition are—

Adeps lanæ hydrosus.
Aloe barbadensis.
Aspidosperma (*Quebracho*).
Cinnamomum saigonicum.
Convallaria.
Elastica (*Indiarubber*).
Eriodictyon.
Eucalyptol.
Menthol.
Oleum betulæ volatile.
Oleum cadinum.
Oleum terebinthinæ rectificatum.
Pancreatinum.
Pepsinum.
Petrolatum liquidum.
Petrolatum spissum.
Rhamnus purshiana.
Strophanthus.
Terebenum.
Terpini hydras.
Viburnum opulus.
Zea (*Corn-silk*).

The chemicals added are—

Acetanilidum.
Acidum hypophosphorosum dilutum.
Acidum stearicum.
Alcohol absolutum.
Alcohol deodoratum
Aloinum.
Barii dioxidum.
Caffeina citrata.
Calcii sulphas exsiccatus.
Cocainæ hydrochloras.
Ferri et quininæ citras solubilis.
Hydrastininæ hydrochloras.
Hyoscinæ hydrobromas.
Hyoscyaminæ hydrobromas.
Methyl salicylas.
Naphtalinum.
Naphtol.
Paraldehydum.
Physostigminæ sulphas.
Pyrogallol.
Resorcinum.
Salol.
Sodii nitris.
Sparteinæ sulphas.
Strontii bromidum.
Strontii iodidum.
Strontii lactas.

The galenicals added are—

Aqua aurantii florum (*diluted*).
Aqua chloroformi.
Aqua hydrogenii dioxidi.
Aqua rosæ (*diluted*).
Caffeina citrata effervescens.
Elixir aromaticum.
Elixir phosphori.
Extractum apocyni fluidum.
Extractum asclepiadis fluidum.
Extractum aspidospermatis fluidum.
Extractum cimicifugæ.
Extractum convallariæ fluidum.
Extractum eriodictyi fluidum.
Extractum jalapæ.
Extractum lappæ fluidum.
Extractum menispermi fluidum.
Extractum phytolaccæ radicis fluidum.
Extractum rhamni purshianæ fluidum.
Extractum scoparii fluidum.
Extractum uvæ ursi.
Extractum viburni opuli fluidum.
Glyceritum acidi carbolici.
Glyceritum acidi tannici.
Glyceritum boroglycerini.
Glyceritum hydrastis.
Lithii citras effervescens.
Oleatum zinci.
Pilulæ catharticæ vegetabiles.
Pilulæ ferri carbonatis.
Potassii citras effervescens.
Spiritus amygdalæ amaræ.
Spiritus aurantii compositus.
Spiritus glonoini.
Spiritus phosphori.
Suppositoria glycerini.
Tinctura lactucarii.
Tinctura quillajæ.
Tinctura strophanthi.
Trochisi santonini.

The index is very full, extending to forty-two pages, and in the case of all Latin titles and Latin names of plants of more than one syllable the accented syllable is distinguished by the sign ′ placed after the corresponding vowel.

Following the lists of articles added to and dismissed from the Pharmacopœia, are two lists of the changes which have been made in official Latin and English titles, and a tabular statement of the comparative strength of the more important pharmacopœial preparations contained in the present and in the preceding Pharmacopœia.

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### TESTING OF COCAINE HYDROCHLORIDE.

One of the most useful means of identifying and ascertaining the purity of alkaloids and their salts is the melting point, and in the case of cocaine salts it is especially useful. There are, however, great discrepancies in the statements to be found in various works. Thus, for instance, the melting point of cocaine hydrochloride is given as 181°·5 C. in the Italian Pharmacopœia, as well as by Beilstein and in Schmidt's 'Pharmaceutical Chemistry.' In Watts' 'Dictionary' the melting point of this salt is said to vary between 181° and 185° C. Hesse gives 185°–186° (*Pharm. Journ.*, [3], xxi., 1110). In a paper read at a meeting of the Berlin Pharmaceutical Society, Dr. Kinzel has recently expressed the opinion that all these data are too low for pure cocaine hydrochloride, and that a well purified cocaine hydrochloride should have a melting point of from 201° to 202° C. This is so very much in excess of any previous observations that there is reason to think the statement must be due to some mistake, or that the numbers given are misprints.—*Pharm. Centralh.*, xiv., 38.

The Pharmaceutical Journal.
FIFTY-THIRD YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 9, 1893.

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE INTERNATIONAL PHARMACEUTICAL CONGRESS.

The extremely meagre report we have received of the proceedings of the Congress held in Chicago presents such a striking contrast to the anticipations which had been formed as to the importance of this assemblage of pharmacists that it would appear as if the interest attaching to it had been exhausted by the previous meetings of the American Pharmaceutical Association. It was there that the announcement of the issue of the seventh revision of the United States Pharmacopœia was made, and it was there that the award of the Hanbury medal to Professor Maisch—intended to have been one of the principal incidents of the Congress—was communicated by the President of the Pharmaceutical Society. The circumstance which gave rise to this derangement of the plans previously made will be a source of deep regret to many in this country and on the Continent who are acquainted with Professor Maisch and with the services he has rendered to pharmacy, as it has been with those more closely associated with him in America.

There is some further indication that the main interest of the pharmaceutical gatherings in Chicago had been exhausted during the meetings of the American Pharmaceutical Association. In the report of the proceedings of the section of pharmaceutical education and legislation on Thursday morning, the 17th ult., published in the *American Druggist and Pharmaceutical Record*, it is stated that Professor Remington made the announcement that Mr. Carteighe would probably have to leave the city earlier than he had intended. On that account it appears he took part in a discussion then proceeding on the present conditions under which pharmacy is practised in America and in this country, and the legislative regulations to which it is subject. On that occasion Mr. Carteighe gave expression to the views he has often put forward here, that the educated pharmacist who knows his business, and conscientiously carries it on with respect for himself and due regard for his duties to the public, will be trusted and appreciated in his capacity as much as the physician is in his.

In the report of the Congress proceedings it is stated that Mr. Carteighe was appointed a Vice-President and a member of two committees, but it is not clear that he was actually present at the Congress, and the above mentioned reference to his probable early departure from Chicago leaves a doubt on that point. The number of visitors at the Congress appears to have been considerable, though in the absence of representatives from Denmark, France, Germany, Holland, Italy, Spain, Portugal, and Russia, the lack of international character was conspicuous. All these circumstances combine to support the conclusion that the Congress was little more than a supplementary function of the American Pharmaceutical Association meeting, and they tend to confirm the previous anticipations of the American *Apotheker Zeitung* to that effect.

## PHARMACEUTICAL FEDERATION IN SWITZERLAND.

The Swiss Apotheker Verein has just celebrated its fiftieth anniversary at a meeting held in Zurich under the presidency of Herr Weber. A number of visitors were present at the meeting, among whom were Dr. Leube, of Ulm, as a delegate representing the German Apotheker Verein, and Herr Sicha as the representative of the Austrian Apotheker Verein. A handsome festival volume has been published in commemoration of the jubilee meeting, containing scientific papers by Professors Schär, Hartwich, and Flückiger, and a very interesting historical retrospect, by the President, of the progress of the Verein from a very small beginning up to the flourishing condition it now has. This is an encouraging illustration of the continued spread of federal organisation among pharmacists which should not be overlooked by those who are endeavouring to make the same condition more general than it has been in this country.

## CHEMICAL HISTORY OF THE ATMOSPHERE.

In the *Chemical News* of August 18, Dr. Phipson gives the chemical history of the atmosphere from its origin to the present day, in accordance with the results of his observations and experiments, particulars of which we have published from time to time. Premising that the matter composing the earth was originally in a gaseous condition at such a temperature that no compounds could exist, he assumes that, when a solid crust later covered an internal molten mass, water was condensed upon the surface and a primitive atmosphere of nitrogen surrounded the globe. Into this atmosphere large quantities of carbonic acid and water were evolved by volcanic action, but there was no free oxygen. Plants then made their appearance, and, in vegetating, evolved oxygen copiously, deriving this element from the carbonic acid supplied by volcanic action. When a certain proportion of oxygen was attained, animal life became possible, and duly appeared. At the same time the proportion of carbonic acid became less, the carbon being stored up as coal, peat, lignite, etc. As these processes proceeded animal life of higher order appeared, the development of the nervous system coinciding with the increase of oxygen in the air. As evidence that the composition of the atmosphere is still slowly changing it is stated that the latest and most careful determinations of carbonic acid in the air have shown a decided decrease (0·05 to 0·03) in the last fifty years.

## CHOLERA AND ARTICLES OF DIET.

THOUGH there is little reason to doubt that the distribution of cholera is mainly due to the use of impure water, in certain cases its communication has been traced to various articles of food, and Mrs. G. C. FRANKLAND, in *Nature*, gives a summary of recent researches on the subject by FRIEDRICH. More than fifty different articles were specially studied, including fruits, vegetables, milk, tea, coffee, cocoa, beer, wine, caviar, biscuits, bonbons, tobacco, and snuff. In the case of solid substances the cholera bacilli were both rubbed on the outer surface and inoculated on to slices. Under the former condition the vitality of the microbes depended chiefly on the degree of moisture present in their environment, but the acid in the juices of fruit caused their destruction on the slices in from one to six hours. The bacilli survived for several days on cucumbers, cauliflowers, and cabbages, whilst on spinach leaves kept in a damp atmosphere they were still present after twelve days. A three per cent. infusion of black Chinese tea destroyed them within twenty-four hours, and in a four per cent. infusion no trace could be found at the end of sixty minutes. In the case of coffee a two hours' immersion in a six per cent. infusion sufficed for the destruction of the organisms. Beer of various kinds was equally fatal, one to three hours being the limit, but wines acted best of all, vitality being extinguished within twenty minutes by red wine and within five minutes by white.

## SCIENTIFIC INVESTIGATION OF DISEASE.

THE annual report of the medical officer of the Local Government Board for the year 1891–92 is devoted in great measure to the consideration of auxiliary scientific investigations. Thus, Dr. KLEIN deals with the Pathology and Etiology of Diphtheria, Concurrent Inoculation of different Infections in the same Animal Body, and the Action of the Bacillus Pyocyaneus on the Process of Tuberculosis; Dr. SIDNEY MARTIN reports on the Chemical Pathology of Diphtheria and of Infective Endocarditis, and gives an account of Diphtheritic Palsy, experimentally produced by the Chemical Poison of Diphtheria; Dr. HAMER discusses the Conditions of Insusceptibility; and Dr. ANDREWES the Growth of Bacteria in Pus. Dr. MARTIN's work is illustrated by a series of thirty-four fine photographs, taken by Mr. DOUDNEY and Mr. ANDREW PRINGLE, and showing the effects on rabbits of the intravenous injection of albumoses.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

WE are asked to announce that the annual excursion of this Association will take place on Wednesday next, the place selected being Solihull, where a cricket match (Married *v.* Single) will be played. Tea will be served later, and followed by a concert. Tickets for the railway journey, etc., may be obtained from Mr. H. J. AUBREY, Honorary Secretary of the Recreation Section, 148, The Parade, Leamington.

## ECONOMIC BOTANY IN TRINIDAD.

WE learn that Mr. J. H. HART, Curator of the Royal Botanic Gardens, Trinidad, has recently returned from a visit to Central America, after having successfully transported thither no less than twenty-five thousand plants of Trinidad cocoa. In return, he has conveyed to Trinidad two highly desirable varieties of the *Theobroma cacao*, and two species new to that colony, and already numerous plants of each are thriving well. One of the varieties is a purely white seeded one, producing large pods and splendid beans, which require only forty-eight hours' fermentation instead of the ten days usual in Trinidad. The second variety, known in Nicaragua as "alligator cacao," is peculiar from the soft covering of its pod, and the raised instead of indented sectional ribs. The new species are *Theobroma bicolor* and *Theobroma sp.*, the latter known as "cacao meco," "cacao mono," or "monkey cocoa."

## PHARMACY IN BRITISH COLUMBIA.

THE third annual meeting of the British Columbia Pharmaceutical Association was held in June of this year at New Westminster, B.C., when the Registrar's report was presented, and showed that the total number of licentiates in pharmacy on the register, for the year ending April 30 last, was sixty-nine. Of these, forty-six were in business on their own account, and the remaining twenty-three were registered as "clerks." The greater number were located in Victoria and Vancouver, as were also most of the seventeen apprentices registered. Since the opening of the new register the numbers have been increased by fifty-nine licentiates and thirteen apprentices. The association is said to be flourishing, and the local Pharmacy Act to work for the general good.

## INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

THE eighth meeting of this body will take place this year at Buda Pesth in the course of the present month, and we have been requested by Dr. C. MULLER, of the Rochus Hospital, the Chief Secretary, to make known that several international committees have been organised with a view to carry out the decisions of the London Congress, and are at present occupied with the solution of the various questions they involve. A separate section has been organised for tropical countries under the Presidency of Dr. THEODOR DUKA, and the two secretaries are Dr. ISAMBARD OWEN and S. DIGBY, Esq., who are now arranging a programme for the section. Arrangements will be made for excursions after the termination of the Congress to the Iron Gates on the Lower Danube, to Belgrade, and to Constantinople.

## AUSTRIAN APOTHEKER VEREIN.

THE annual meeting of this Association will take place at Linz on the 17th instant, and continue during the following three days. In addition to the transaction of the official business of the Verein the proceedings will relate chiefly to the practical affairs of pharmacy. During the meeting there will be several social gatherings and excursions, and the members will dine together on the Tuesday.

## Seventh International Pharmaceutical Congress.

### MEETING AT CHICAGO.

The Seventh International Pharmaceutical Congress was opened in the city of Chicago, Illinois, U.S.A., on Monday, the 21st of August.

There were representatives present from Austria, Belgium, England, Sweden, Norway, Australia, Canada, and the United States.

The number of delegates and members who were invited to the privileges of the floor numbered about one hundred and fifty.

The following officers were elected by the Congress:—

*President.*

Prof. Joseph P. Remington, Philadelphia, Pa.

*Vice-Presidents.*

Emil Ramoloh, Belgium.
Michael Carteighe, England.
N. H. Martin, England.
William Martindale, England.
M. Nyegaurd, Norway.
Thomas Ingham, Australia.
L. W. Youmans, Canada.
E. Muir, Canada.
Albert E. Ebert, Illinois, U.S.A.
Charles Rice, New York, U.S.A.
E. L. Sayre, Kansas, U.S.A.
William R. Thompson, Washington, D.C., U.S.A.
E. L. Patch, Massachusetts, U.S.A.
S. A. D. Sheppard, Massachusetts, U.S.A.

*Secretary.*

Oscar Oldberg, Chicago, U.S.A.

*Assistant Secretaries.*

C. T. P. Fennel, Cincinnati, U.S.A.
M. T. Breslin, New Orleans, U.S.A.
M. La Chance, Montreal, Canada.

The Congress remained in session three days, discussing the papers which had been contributed on a universal pharmacopœia, education and legislation in pharmacy, and on the relation of pharmacy to sanitation and adulteration.

Subsequently, committees were appointed on each of these subjects, and were directed to formulate reports embodying the views and action of the Congress. These reports they will transmit to the next International Pharmaceutical Congress.

A committee consisting of Professor A. B. Prescott, U.S.A.; Emil Ramoloh, Belgium; and Michael Carteighe, President of the Pharmaceutical Society of Great Britain, was then appointed to take charge of the calling and assembling of the next International Congress.

The proceedings of the Congress were ordered to be published, and the arrangements for publication were entrusted to a committee.

## British Pharmaceutical Conference.

### MEETING AT NOTTINGHAM.

*Wednesday, August* 16.

(*Concluded from page* 198.)

### PAPAIN.

BY FREDERICK DAVIS, B.SC.

Papain is the active principle of the *Carica papaya* or papaw tree. This plant, a native of South America, West Indies, and other parts enjoying a tropical temperature, I am informed by Mr. Jackson, A.L.S., of Kew, varies in height from five to twenty feet, according to age. It is of an herbaceous character, and when well founded bears a plentiful and continuous supply of fruit.

The cylindrical trunk is simple, and bears at the summit a tuft of palmately-lobed leaves.

The staminiferous flowers are arranged in a racemose manner, whilst the pistillate flowers are for the most part sessile.

The plant is diœcious, belonging to the Passifloræ. The trunk and leaves abound in a milky juice, which possesses the power of rendering the toughest meat tender in a very short period of time.

The fruit termed the "papaw" is employed by the natives in a variety of ways, in its unripe state being boiled and used as a vegetable, and in its ripe state eaten as dessert. The leaves are used in washing in the place of soap. Papain may be prepared from the juice of the plant by treating with alcohol, dehydrating the resulting precipitate and extracting with water, preferably at a temperature from 36° to 40° C. The commercial varieties differ largely, not only in colour and appearance, but to a great extent in proteolytic action. The colour varies from light brown to nearly white, and I have observed generally the more nearly colourless the sample the greater its activity. Papain is an albuminoid body, but differs from peptones in the fact of not yielding a precipitate with either acetate of lead or perchloride of mercury.

As previously stated, the commercial samples of papain vary considerably. I therefore considered it necessary to subject some of these to dialysis, thus obtaining the active principle in a fairly pure state. It may be on this account that past researchers obtained such varying and conflicting results.

If a larger quantity of water be employed in experimenting with the same quantity of papain and dried fibrin or albumin it will be found to influence the final results very markedly, also that with a larger quantity of water, a smaller quantity of the same sample of papain and the same quantity of fibrin a different digestive result is arrived at, the temperature being maintained throughout at 35° C.

Albumin was employed in the following instances, being more reliable for experimental purposes than dried fibrin.

*Experiment No. I.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·3 gramme. |
| Distilled water | 50 c.c. |

Digested 38 hours at 35° C.

*Neutral Solution.*

Result:—

| | |
|---|---|
| Digested | 1·785 |
| Residue | 1·215 |

*Experiment No. II.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·25 gramme. |
| Distilled water | 100 c.c. |

Digested 48 hours at 35° C.

*Neutral Solution.*

Result:—

| | |
|---|---|
| Digested | 1·935. |
| Residue | 1·065 |

*Experiment No. III.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·3 gramme. |
| Hydrochloric acid | (·005 per cent). |
| Water to | 500 c.c. |

Digested 48 hours. Temperature 35° C.

Result:—

| | |
|---|---|
| Digested | 2·005 |
| Residue | ·995 |

*Experiment No. IV.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·3 gramme. |
| Hydrochloric acid | (·050 per cent.) |
| Water | 500 c.c. |

Digested 48 hours. Temperature 35° C.

Result:—

| | |
|---|---|
| Digested | none. |
| Residue | 3 grammes. |

With a higher percentage of acid the results compare with the last experiment, namely, no conversion into peptones whatever. The presence or absence of peptones was ascertained by the copper test. With regard to digestion in alkaline solution, papain is found to increase in proteolytic action if the alkalinity is not above ·25 per cent., carbonate of soda being employed for the purpose.

*Experiment No. V.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·3 gramme. |
| Sodium carbonate | (·25 per cent.) |
| Water | 100 c.c. |

Digested 48 hours. Temperature 35° C.

Result:—

| | |
|---|---|
| Digested | 2·358. |
| Residue | ·642. |

*Experiment No. VI.*

| | |
|---|---|
| Albumin | 3 grammes. |
| Papain | ·3 gramme. |
| Sodium carbonate | (·20 per cent.) |
| Water | 500 c.c. |

Digested 48 hours. Temperature 35° C.

Result:—

| | |
|---|---|
| Digested | 2·507. |
| Residue | ·493. |

Digestion takes place in media containing a much larger percentage of sodium carbonate, but in no way approaching the above results. The action of papain with milk is in every respect in ratio with the foregoing results, but the fat is not in any way emulsified, excepting of course to the extent of the alkalinity of the medium. Recapitulating, we find papain to be active as a digestive in neutral and weakly alkaline media, but its action entirely stopped by the presence of ·050 per cent. of hydrochloric acid.

Statements have been made that "papain" is capable of digesting living tissue, and an experiment is quoted in Christy's 'New Commercial Plants and Drugs' (No. 8), where Professor Finkler says he found certain preparations of papain to dissolve living frogs and worms. I have experimented largely in this direction, and can say positively the frogs were in no case digested; death occurred, and the amphibean decomposed, but no peptones were formed. In fact, the acid developed in the dermis of the frog is sufficient to prevent the action of papain. Papain appears to act as a poison to the frog. The creature will not live for long in a solution of papain, but decomposition certainly does not take place until after the death of the animal. I think, therefore, nothing further need be said upon this point.

With regard to the products of fermentation by the action of papain upon proteids, I have found undoubtedly a resemblance to that of trypsin, and by following the suggestions of Dr. Sidney Martin, of University College, proved positively the formation of various amido-acids, tyrosine, and leucine, and by further decomposition indol was produced.

In conclusion, I have to thank not only Dr. Sidney Martin for most valuable suggestions, but also Messrs. Christy and B. Kühn for samples of papain and specimens of the fruits.

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Mr. **Parry** said some perhaps had seen a pamphlet lately published in which it was stated that papain was active in an acid solution; in fact, the statements in it were diametrically opposed to those now put forward. He should like to know if there was any explanation of this discrepancy, or whether it must be taken to arise from the different motives of the authors.

Mr. **Gerrard** regretted the author was not present to explain his views more fully. He had had some experience of the action of ferments on albumin, and it was a novelty to hear that papain acted in the presence of both acid and alkaline solutions. He should have liked to ask Mr. Davis how he determined the development of the digestion and the formation of the peptone. It was easy to say that a substance was digested; but the mere fact that albumin passed into solution was not a proof of it. Acids and alkalies acted on albumin to form acid and alkali albumin, but you must not only prove the presence of peptone by the copper test; you must take some sulphate of ammonium, either in concentrated solution or as a salt, and add that, when all proteids but the peptone would be precipitated; then you must remove the ammonium sulphate by means of baryta by a very lengthy process. It was only in that way that you could really prove that a substance had been peptonised. He had always found it very easy to peptonise albumin in the raw state when diluted with water, and the greater the dilution the more rapidly would it peptonise. With any of these ferments in an active condition, with a proper percentage of acid, and at the proper temperature, digestion was very rapid; and the finer you divided the albumin if it were coagulated the sooner would the operation take place. It was aided by motion of the particles, and no doubt the motion going on in the stomach was useful in this way. He did not expect papain would digest living tissue, but no doubt a solid piece of dead meat or dead frog if placed in a ferment would undergo digestion superficially, because only the surface would be in contact; if you cut up the meat and exposed a large surface digestion would proceed. In his experience, papain was most used in removing diphtheritic membranes, being painted on in a strong glycerin solution and the throat afterwards mopped out with a strong solution of chlorinated soda. This was a very effective and popular remedy.

Mr. **Druce** said Mr. Ball gave, in the 'Year-Book' for 1889, the results of some experiments on pepsin and papain. He found that with hydrochloric acid pepsin dissolved 1·3 per cent., while papain yielded only ·34, but his results showed that an acid solution did not stop the digestibility of the albumin. He understood that the papaw tree was so widely cultivated that its real origin (probably of tropical America), (Hemsley, 'Biol. Cent. Amer.,' 1, 480) was rather doubtful.

The **President** said he thought it was a native of the Caribbean Sea.

Mr. **Druce** said he scarcely knew whether it was a true species at all, it had been much altered by long culture or prehistoric hybridisation (cf. Sohns Laubach in Bot. Zeit., 719, 1889). There was no doubt that the fresh leaves had a wonderful power in disintegrating tissue. The natives had used the leaves from time immemorial for wrapping up tough meat in before cooking, and this was found to make it fairly tender. Papain was well known as a useful agent for removing diphtheritic membrane, and was also used for similar diseases of the throat in birds and animals.

Mr. Naylor said it was rather difficult to follow a paper of this kind, but it must be distinctly understood that Mr. Davis did not state that albumin was not digested at all in the presence of acid and papain, but that when the acid reached a certain percentage the proteolytic action ceased.

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Abstract read by Mr. Ransom.

## THE IPECACUANHAS OF ENGLISH COMMERCE.

BY E. M. HOLMES, F.L.S.

For some months past attention has been directed to the inferiority in character of recent importations of ipecacuanha, due to the large admixture of the woody stem with the root. Conflicting statements have been published regarding the relative proportion of alkaloid present in the stem and in the root. According to a series of careful analyses recently made by Messrs. Paul and Cownley (*Pharm. Journ.*, [3], xxiv., 61), the stem appears to contain about one-third less of alkaloid than the root. But the chemistry of ipecacuanha has never been thoroughly worked out. It has been stated that the root contains emetine, choline, and a volatile alkaloid, and Messrs. Paul and Cownley have recently proved that the so-called emetine is by no means pure, but contains, mixed with it, a crystalline alkaloid that is present in greater quantity in the stem than in the root. They have, moreover, shown that Carthagena ipecacuanha also contains a crystalline alkaloid which is not identical with that obtained from Brazilian ipecacuanha. We may, in fact, be said to be practically ignorant how far the properties of the drug are due to amorphous emetine or to the crystalline alkaloid, and therefore how far the percentage of emetine (so-called) may be taken to indicate the medicinal value of the root. It seems highly probable that the medicinal value of the root does not depend upon emetine entirely, since results are obtained by the powder that cannot be obtained from emetine.

I have thought, therefore, that at the present time it might be useful to direct attention to the varieties and qualities of the drug as met with in commerce, and to append a histological table by which the spurious ipecacuanhas that occasionally enter the London drug trade may be detected by the retail pharmacist, for upon him the responsibility rests of securing for the public pure drugs, a responsibility which is too often relegated to the wholesale druggist.

The ipecacuanhas of English commerce may be divided into two sections—

1. Those that are derived from the genus *Cephaëlis.*
2. Those that are derived from other genera belonging to the same or to different natural orders.

1. Official Ipecacuanha (*Cephaëlis Ipecacuanha*, Rich.).—Of this kind there are several commercial varieties or qualities.

*A. Brazilian or Rio Ipecacuanha.*—When of good quality the roots are one to two lines in diameter, and externally of a reddish or blackish-brown colour. Specimens without a powdery surface are to be preferred, since the powdery appearance is often due to the remains of moulds. A good sample should yield about 80 per cent. of bark.

*B. Indian Ipecacuanha.*—This is derived from the plant cultivated in Johor (Straits Settlements), and has only been introduced during recent years. It is imported from Singapore. Commercially it is distinguished from the Brazilian kind by the presence of the delicate rootlets, which usually occur to a much smaller extent in the South American drug. According to an analysis by Mr. Ransom[*] it contains 1·7 of (the so-called) emetine as against an average of 1·66 per cent. in the Brazilian kind, and may therefore be supposed to be of good quality.

*C. Mouldy Ipecacuanha.*—It is calculated that about three out of every four serons of ipecacuanha root imported have been damaged by sea-water during the voyage to Europe or during transit to the coast from the place of collection ('Pharmacographia,' 2nd ed., p. 375). It has been maintained by some that the mouldiness does not affect the amount of alkaloid present. This statement needs confirmation.

*D. Woody Ipecacuanha.*—It is of the prevalence of this quality in commerce that complaints have recently been made. It is characterised by the presence of an unusual amount of stem. A small piece of the woody stem is often attached to the root in good samples, but in woody ipecacuanha it may amount to 30 or 50 per cent. of the whole. The stem is easily recognised by its smooth not annulated surface, remarkably thin bark, and by the presence, visible under a good lens, of pith in the centre of the woody column. As the stem is not official in the Pharmacopœia, and is probably one-third weaker than the root, it should not be used for pharmacopœial preparations. It is obvious that in croup, or in cases where a prompt emetic is required, preparations made from such a root, and therefore deficient in medicinal activity, might lead to fatal results.

*E. Doctored Ipecacuanha.*—This quality consists of inferior, woody, or mouldy ipecacuanha that has been washed and dried. It has a dark colour and clean epidermis, contains few large pieces, and the bark has been much broken off the root in the process of washing. By this latter character and its dark colour it is easily recognised.

2. Carthagena or Savanilla Ipecacuanha (*Cephaëlis acuminata*, Karsten[†]).—This kind of ipecacuanha has recently been imported in increasing quantities.[‡] It is, however, by no means a new article in commerce. It is probably identical with the grey annulated ipecacuanha of Pereira, which he describes as "occurring in pieces of larger diameter than ordinary ipecacuanha, with fewer, more irregular and less prominent rings." Professor Guibourt remarked that considerable quantities of it arrived unmixed with the ordinary sorts, and that he thought it to be a distinct kind coming from a different part of Brazil, and derived from another species of *Cephaëlis* (Pereira, 'Mat. Med.,' vol. ii., pt. ii., p. 58). This description is exactly applicable to the Carthagena ipecacuanha of the present day, which is characterised by the less prominent and more distant rings and transverse fissures.

Under the microscope it presents, according to Karsten,[§] a distinctive feature in the fact that the cortical parenchyma forms two distinct layers, which is not the case in ordinary ipecacuanha. The radiate structure of the central woody column is also more distinctly visible than in the ordinary ipecacuanha.

Carthagena ipecacuanha has been analysed by Dr. Wimmel,[‖] Conroy, and others, and the results obtained indicate that it varies, like the Brazilian drug, in percentage of alkaloids, but that on the whole it is probably not inferior to it in the amount of alkaloid present. It must be remembered, however, that it contains a different crystalline alkaloid which is not chemically identical with that of the Brazilian drug. The root of *Cephaëlis Ipecacuanha* has been figured in several works on materia medica, of which the following may be mentioned: Goebel and Kunze, 'Waarenkunde,' tab. xxx., fig. 1; Martius, 'Specimen Mat. Med. Bras.,' tab. i. and viii., fig. 1, 2; Pereira, 'Mat. Med.' (1887), vol. ii., part ii., p. 57, fig. 8; Planchon, 'Hist. Nat. des Drogues Simples' (7th ed.), vol. iii., pp. 85, 86, figs. 599–600. The microscopical structure has also been fully illustrated in Berg. 'Anat. Atlas,' part vii., A. and B.; Vogl, 'Anat. Atlas,' tab. xlvii., figs. 1–3; Herail and Bonnet, 'Bot. Méd.,' part. vi., fig. 169; Moller, 'Lehrbuch der Pharmacognosie,' p. 312, fig. 189; Tschirch and Ludtke, 'Archiv. der Pharm.,' 1888, pp. 444, 445, figs. 1, 2, 3.

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[*] *Pharm. Journ.*, [3], xviii., 400.

[†] 'Med. Deutsch Flor.,' p. 1197.

[‡] Specimens in the Hanbury materia medica collection bear the dates of importation, viz., 1864, 1868, 1872.

[§] *Pharm. Centralh.*, 1892, p. 639.

[‖] *Pharm. Journ.*, [3], xxiii., 267.

### SPURIOUS IPECACUANHAS.

Owing to the name "Poaya" being used in a generic sense in South American countries for roots possessing emetic properties, various drugs bearing this name are sent to this country by merchants at intervals of a few years. Sometimes these meet with purchasers, but their ultimate destination is involved in obscurity. None of them approach ipecacuanha in therapeutic value. Hence a description of their appearance in the crude state may prove useful.

The plants from which these Poayas are derived belong chiefly to the natural orders *Rubiaceæ* and *Violaceæ*, and one to the *Polygalaceæ*.* Those which have been identified in English commerce are three in number, viz.: (1) *Psychotria emetica*, (2) *Richardsonia scabra*, and (3) *Ionidium Ipecacuanha*.

Several other spurious ipecacuanhas, more or less resembling these three, have at intervals been imported into Europe, but probably have not been distinguished from them, except in one or two cases, in which a microscopic examination has been made. Of these I only propose to notice those that have been met with in commerce in this country. A large number of others obtained from International exhibitions and Continental museums have been examined by Messrs. Tschirch and Ludtke, and structural details have been given in the *Archiv. der Pharm.*, 1888, p. 444, etc.

A. BLACK OR GREATER STRIATED IPECACUANHA (*Psychotria emetica*, Mutis.). — This is so-called from its black epidermis. The root is slightly larger than Rio ipecacuanha and strongly constricted at intervals of about an inch, more or less, the intermediate portions being cylindrical and striated longitudinally. Internally the cortical portion is thick in proportion to the woody column, and presents a horny appearance, and sometimes a purplish tint. A decoction of the root gives evidence of the presence of a reducing sugar,† but not of starch. According to Mr. F. Ransom it contains traces (·016 p.c.) of emetine, or of an alkaloid giving the same reactions. The woody column is dense, and not visibly porous.

B. LESSER STRIATED IPECACUANHA (*Richardsonia species*).—This drug externally has also a black colour and striated appearance, and constrictions at intervals like the greater striated ipecacuanha, but it presents marked differences internally. The cortical portion is often of a dark violet tint, and is full of starch, which can readily be detected in the cold decoction by iodine, and the woody column is seen to be distinctly porous when viewed under an ordinary lens. Professor Planchon refers it provisionally to the genus *Richardsonia*.* Examined by F. Ransom it was found to contain ·027 of emetine.†

C. UNDULATED IPECACUANHA (*Richardsonia scabra*).—Externally the root is of a greyish brown colour, and differs from ipecacuanha in not having raised rings. It is, however, marked with deep constrictions, often on alternate sides, which gives the root a somewhat undulated or falsely annulated appearance. In transverse section the root is seen to be white and starchy, and sometimes has a faint violet tint, and the woody column is yellow and porous. It has been stated to contain emetine, but the statement needs confirmation.

D. (1) WHITE IPECACUANHA, IONIDIUM IPECACUANHA.—This drug differs from the foregoing in its pale yellowish-brown colour and much branched character. The woody column is large, yellow and porous, and the cortical portion is thin, so that the root is more woody in character than *Richardsonia*, but it has transverse fissures and constrictions like the latter. It does not contain starch (Moeller, 'Lehrbuch für Pharmacognosie,' p. 313).

D. (2) A root, supposed to be that of *Ionidium Ipecacuanha*, entered the London market in 1884, and was examined by Mr. W. Kirkby, who pointed out that it differed from the root of that plant in having large, wedge-shaped groups of sclerenchymatous cells in the cortical portion, and more or less broad medullary rays in the woody column (*Pharm. Journ.*, [3], xvi., 126).

E. FALSE INDIAN IPECACUANHA.—Some years ago a quantity of a small root said to be imported from Southern India was offered in the London market as ipecacuanha.‡ It differs from true ipecacuanha in colour, which is of a pale reddish-brown, but it presents a ringed appearance.

A transverse section, however, shows that the hard, woody central column so characteristic of ipecacuanha is absent, and that the root has a monocotyledonous structure. Its rhizomatous character—for the rings indicate the remains of leaf bases—its slightly acrid taste, and the small starch grains present in its tissue, show that it probably belongs to the *Araceæ*. It has been referred to *Cryptocoryne spiralis* and to *Lagenandra lancifolia*, but I have not been able to identify it with either of these species as represented in the Kew Herbarium.

The following key to the microscopical structure of the commercial ipecacuanhas may perhaps prove useful to pharmacists. It is based upon a paper on this subject by Tschirch and Ludtke in the *Archiv. der Pharmacie*, 1883, p. 441. Several of the varieties mentioned by these authors have not been met with in English commerce. On the other hand, some are now added which have appeared in English commerce, but do not seem to occur in their list.

I. Woody column containing chiefly tracheids, but no vessels.

A. *Root bark containing starch and raphides.*

1. Parenchyma of bark uniform = *Rio Ipecacuanha.*

2. Parenchyma of bark forming two layers = *Carthagena Ipecacuanha.*

B. *Root bark containing no starch, but sugar.*

Woody centre, not visibly porous = *Greater Striated Ipecacuanha.*

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* The name "Poaya verdadeira," or "Poaya de botica," or "Poaya preta," is applied to *Cephaëlis Ipecacuanha*, Rich.; "Poaya branca" to *Richardsonia scabra*, DC., and *Ionidium Ipecacuanha*, Vent.; "Poaya do campo" to *Borreria Poaya*, DC., and *Polygala Poaya*, Mart.; "Poaya da praia" to *Borreria ferruginea*, DC., *Machaionia Brasiliensis*, Willd., and *Ionidium ipecacuanha*, Vent.; "Poaya do rio" to *Machaionia Brasiliensis*, Willd.; "Poaya de hasta comprida" to *Borreria emetica*, Mart., 'Syst. Mat. Med. Bras.,' pp. 92—94.

† *Pharm. Journ.*, [3], xviii., 788.

* *Journ. de Pharm.*, xvi. (1872), p. 400; xvii., p. 19.

† *Pharm. Journ.*, [3], xviii., 788.

‡ *Pharm. Journ.*, [3], xviii., 628. 'Pharmacographia Indica,' vol. iii., p. 548.

II. Woody cylinder containing vessels, wood-cells, and medullary rays.

A. *Root-bark containing starch.*

1. Medullary rays composed of a single row of cells, woody centre visibly porous = *Lesser Striated Ipecacuanha.*

2. Medullary rays forming two or three rows of cells = *Undulated Ipecacuanha.*

B. *Root bark containing inulin.*

1. Medullary rays of a single row of cells, no starch, sphæraphides in the bark = *White Ipecacuanha* (*a*).

2. Bark contains stone cells.

3. Medullary rays broad = *White Ipecacuanha* (*b*).

III. Rhizome having a monocotyledonous structure, brown pigment cells in parenchyma, acicular raphides and starch present = *False Indian Ipecacuanha.*

It should be remarked, in conclusion, that although it is comparatively easy to identify any of the spurious ipecacuanhas by their microscopical structure and external characters as seen under a good lens, it is by no means so easy to detect the presence of the spurious roots in powder, since in several of them starch and acicular raphides are present, and the starches can only be determined by careful and repeated examinations and measurements. It may be hoped, therefore, that a process for obtaining emetine in a pure state will soon be devised, so that it may be possible to obtain a standard for genuine powder. Until then chemists will do well to purchase ipecacuanha root containing as little stem as possible, and to powder it themselves. In this way only is it possible at present to personally guarantee satisfactory preparations.

## DEËMETINISED IPECACUANHA.

BY F. C. J. BIRD.

Ipecacuanha deprived of its emetine appears to have been first suggested as a remedy in dysentery by Surgeon Major Harris, of Simla, who, in a letter to the *Lancet* (Aug. 30, 1890), pointed out that the deëmetinised root answered equally as well as ordinary ipecacuanha in the treatment of that disease, whilst it possessed the great advantage of avoiding the extreme nausea and depression hitherto inseparable from the administration of the drug. So distressing are these effects, remarks the same writer, that it is difficult to adequately conceive the fearful feeling of depression caused by 30-grain doses, and patients who have had previous attacks of dysentery justly look forward with dread to a further experience of the same remedy.

Since the appearance of the letter alluded to, other investigators have taken the matter up and published more or less conflicting results. Indeed, in the hands of Surgeon Captain Walsh, the deëmetinised preparation was found to be of such little value that he attributed the antidysenteric action of ipecacuanha entirely to the emetine contained in it. Quite recently, however, Drs. A. A. Kanthack and A. Caddy have contributed a very interesting report to the *Practitioner* (June, 1893), in which they clearly proved deëmetinised ipecacuanha to be of the greatest value in the treatment of dysentery, and the discordant conclusions of different observers to have arisen from the imperfect methods by which the removal of the emetine had been attempted. They found the various samples of the preparation which they were able to obtain to be of very varying efficacy, different processes having probably been followed in their production. They included in their investigation samples procured from six different sources (three Indian, two English, and one German), and in addition to physiological trial, they estimated the percentage of emetine and extractive soluble in alcohol in each. The emetine varied from traces to 1·2 per cent., whilst the yield of alcoholic extractive was from 2·5 to 11·3 per cent. The antidysenteric value was in direct proportion to the amount of alcohol-soluble substances present, provided that the emetine had been completely removed or existed in very minute quantity. The sample which gave the best results in the hands of the authors of the paper was of German origin, and showed on analysis traces of emetine with 10·3 per cent. extractive soluble in alcohol. They stated further that "this manufacturer alone had succeeded in removing as much of the emetine as could be expected without appreciably disturbing the other constituents of the root." Allusion was made to this report in the *Pharmaceutical Journal* of June 3 last, by a writer in the "Month," who, whilst remarking the want of details of the processes by which the samples employed by Drs. Kanthack and Caddy were prepared, indicated the desirability of a satisfactory method of extracting the emetine without affecting the other constituents.

Surgeon Major Warden, in 1891, deëmetinised ipecacuanha by percolation with alcohol acidulated with acetic acid, and other solvents that have been suggested to me as giving good results are alcohol and ammoniated chloroform. In the light of Drs. Kanthack and Caddy's analyses, the two first may be at once dismissed as unsuitable, removing as they do the antidysenteric principle in the alcoholic extract. Further, it appeared desirable to avoid the use of alkali if possible, so that the natural state of combination of the constituents of the root might remain unaltered. Twenty grammes of Rio ipecacuanha in No. 80 powder were therefore extracted in a Dunstan and Short's apparatus with plain chloroform, first cold and then boiling. The operation was a tedious one, and although the bulk of the alkaloid was removed the residual powder, when dried with milk of lime, digested with chloroform, and evaporated, gave a distinct precipitate with dilute acetic acid and Mayer's reagent. The chloroform removed from the above quantity of root ·573 gramme extract, equal to 2·86 per cent., and the extract obtained by afterwards percolating the residue with strong alcohol weighed 1·951 gramme, equal to 9·75 per cent. Seeing that the nearly complete removal of the emetine is so important, chloroform alone as a solvent cannot be recommended.

Another experiment was made, using ammoniated chloroform prepared as in Ransom's assay process by agitation with liq. ammon. fort. in a separator. In this case extraction was effected very readily, and the residual powder, when treated as before, gave a scarcely perceptible cloudiness with "Mayer." The extract was, however, much darker in colour than that from plain chloroform. Dried in a water oven it weighed ·720 gramme, equal to 3·6 per cent.

The residue in the percolator, after drying, was extracted with strong alcohol and the solvent evaporated. This extract weighed 1·803 gramme, equal to 9·01 per cent.

The ammoniated chloroformic solution from another 20 grammes of root was washed several times with dilute sulphuric acid to remove the emetine and then with distilled water. On evaporating the chloroform an extract remained weighing ·312 gramme, equal to 1·56 per cent. It gave no reaction either for sulphates or alkaloid.

This extract dissolved almost entirely on treatment with warm alcohol. The solution filtered and evaporated to dryness left a residue weighing ·302 gramme, equal to 1·51 per cent., thus showing a loss of ·05 per cent. due to matter insoluble in alcohol.

The alcoholic residue having been dissolved in a sufficient quantity of chloroform was returned to the 20 grammes of powder from which it had been obtained, the whole uniformly mixed, and the chloroform allowed to evaporate. The product was a pale brown powder, containing but a trace of emetine, and yielding 10·52 per cent. of its weight to alcohol. A decoction of it gave a green coloration with ferric chloride, indistinguishable from that afforded by an equal quantity of the ordinary drug when similarly tested, thus indicating the presence of ipecacuanhic acid. The foregoing details summarised are as follows:—

*From* 20 *grammes root.*

| | Per cent. |
|---|---|
| Emetine in root before extraction ...... | 1·73 |
| (*a*) Extracted by ammon. chloroform... | 3·6 |
| Portion of (*a*) soluble in alcohol ......... | 1·51 |
| Extracted by alcohol ........................ | 9·01 |
| Total alcoholic extract ...... | 10·52 |

These figures agree closely with those obtained from the German sample of deëmetinised ipecacuanha approved of by Drs. Kanthack and Caddy, and considered by them to be the best. I therefore suggest that a satisfactory process for removing the emetine from ipecacuanha without appreciably disturbing its other constituents consists in percolating the root in fine powder with ammoniated chloroform until completely exhausted of alkaloid, washing out the emetine from this with dilute sulphuric acid, returning the washed chloroform to the powdered root, mixing uniformly, and finally drying the product either by exposure to air or at a gentle heat.

It would be useful to ascertain to what extent that portion of the chloroformic extract other than alkaloid possesses antidysenteric properties, but as this is a point which cannot at present be decided by chemical investigation, I hope shortly to have the chloroformic extract tried and reported upon by a medical friend.

Little is known of the particular constituent of ipecacuanha to which its antidysenteric action is due. Some have attributed it to ipecacuanha-tannic acid, but I think this supposition admits of considerable doubt.

The isolation and identification of the antidysenteric principle offers an excellent opportunity for useful and interesting research.

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The PRESIDENT said he thought the closing remark in Mr. Holmes' paper with reference to powdered ipecacuanha was rather uncalled for. He felt sure that if the retail pharmacist were willing to pay a fair price there were some, if not many, wholesale houses who would supply him with a genuine article. The advice given was for the chemist to powder it himself, and he was perfectly sure he would have to do it himself, for the modern apprentice would certainly refuse to do it.

Mr. CONROY agreed with the President that the concluding remark by Mr. Holmes to which he had alluded had better have been omitted, for genuine powdered ipecacuanha could always be obtained from good houses. He understood Mr. Holmes to say that the nature of the emetine obtained from the real root was not identical with that obtained from the Carthaginian root, but he did not know whether any proof of that statement was advanced. If it were he should be glad to know it, for it was not an easy point to settle.

Dr. B. H. PAUL said he had lately had occasion to examine some samples of ipecacuanha for the purpose of ascertaining the amount of so-called emetine in them. At the outset he was impressed with the defective nature of most of the methods recommended for the determination of emetine, and endeavoured in the first place to devise one by which better results could be obtained. He had not proceeded very far before it became evident that the alkaloid in ipecacuanha, to which the name emetine had been given, is by no means an independent, homogeneous chemical substance, but consists of two or more distinct alkaloids. Emetine is described as being a perfectly amorphous substance, incapable of crystallisation, and as generally obtained, either by means of chloroform or ether, from Brazilian ipecacuanha, it is always in that form; a solution with either of those solvents drying up to a perfectly transparent varnish. But when the alkaloid was sufficiently purified it could be separated into two portions, one of which was distinctly crystalline. He had with him a small quantity of these crystals, which he would hand round. So long as it was mixed with the amorphous base, there was no sign of crystallisation at all, but was the resinous transparent mass usually met with. It was not until the separation was effected to a considerable extent, which was a tedious matter, effected by continual fractional precipitation, that you got this base distinctly crystallising. But the hydrochloride of the amorphous base was a distinctly crystallisable salt, which was very soluble in water, though it would crystallise from a watery solution much in the same way as hydrochloride of morphine. With regard to the amount of alkaloid in ipecacuanha, the fact that there were two distinct substances present rendered it difficult to determine the value of ipecacuanha on the basis of the alkaloid present, until something was known of the therapeutic action of the two different alkaloids. He hoped before long to have worked out some descriptions of the characteristics of these two or three bases which he had already separated, and to get them therapeutically examined, so as to learn which was the efficacious medicinal agent and what were the characters belonging to it. Altogether the knowledge of the therapeutics of ipecacuanha was very deficient, and this was well illustrated by what had been written lately about deëmetinised ipecacuanha. The reports from Indian physicians were in direct conflict with one another; some saying that the deëmetinised ipecacuanha was no better than sawdust, and others that it was very efficacious. Mr. Martindale had been kind enough to obtain for him a sample of the so-called deëmetinised ipecacuanha, supplied by the German house referred to by Dr. Kanthack, and on submitting it to analysis he found it contained nearly ·5 per cent. of the alkaloid corresponding to the ordinary alkaloid from ipecacuanha. The difference between the root and the stem attaching to what was called woody ipecacuanha appeared to him to be a result of the different relative proportion between the woody core and the bark. In the stem of ipecacuanha there was an extremely thin bark, the whole mass almost consisting of woody core, whereas in the true root there was a comparatively slender woody core and a very thick bark. He had good reason to believe that the seat of the alkaloid was entirely in the bark, and consequently it was easy to understand that woody ipecacuanha containing a large proportion of stem would contain much less alkaloid than the true root.

Mr. COLLIER said Mr. Bird's paper was very interesting to him. Patients were occasionally brought into Guy's Hospital from the neighbouring tanneries suffering from a severe form of disease, acquired by handling the skins of diseased animals. It was characterised by a pustule which had to be excised, and ipecacuanha in powder was then applied to the surface, and also administered internally. This was found extremely successful in nearly all cases. Experiments had been made which showed that the ipecacuanha powder had the effect of checking the growth of the particular anthrax bacillus, but a solution of emetine in acetic acid had no such effect; a solution of tannic acid was also tried with the same result. It appeared therefore that ipecacuanha in powder certainly did stop the progress of anthrax, but emetine and tannic acid did not. What the active principle in this case was they did not know There seemed to be something in ipecacuanha which had this power, because the root, without emetine, seemed to have been more successful in India in cases of dysentery than when it was present.

**Mr. Druce** remarked on the curious connection between two such different diseases as anthrax and dysentery; both were due to a bacillus to which ipecacuanha appeared to be fatal.

**Mr. Bird** thought attention had not been given sufficiently to the resins contained in ipecacuanha to the extent of nearly 0·5 per cent. He was rather surprised at Dr. Paul's analysis of the German sample containing ·5 of alkaloid, which was given in Drs. Kanthack and Caddy's account as being minimal, and it did not give one a very high idea of the reliability of German preparations. He regretted that time had not allowed of his examining the chloroform extract farther, but he hoped to do so on some future occasion.

**Mr. Strother** said some few years ago a sample of powdered ipecacuanha was offered to the house he was then in which appeared to be of a very high character, but the price was such as to lead to suspicion. After a good deal of trouble the source from which it was obtained was ascertained, and it was found to be a perfectly pure root, but it had been brought on the deck of a vessel where it got covered with sea water and full of worms. When dried and powdered it produced a very good article in appearance. He thought therefore that Mr. Holmes was quite right in suggesting that chemists should see the root from which their powders were produced.

**Mr. Ransom** wished to add one word on the part of Mr. Holmes. It was not the emetine which differed in the Carthagena and Rio root, but the other crystalline body which Dr. Paul had separated. He did not suppose the emetine to be different.

The Conference then adjourned for luncheon.

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## THE DETERMINATION OF THE DIASTASIC ACTION ON STARCH.

BY D. B. DOTT, F.R.S.E.

The action of diastase on starch is employed analytically for two purposes: (1) the determination of diastase (or rather of diastasic power, as the molecular weight of diastase is unknown) and (2) the determination of starch. For the former purpose it is most usual to allow a known weight of the diastasic solution to act on a known amount of starch paste at a certain temperature until the mixture ceases to give a blue colour with iodine; while for the second purpose it is customary after a similar operation to determine, by means of Fehling's solution, the amount of sugar formed, it having been ascertained that for a particular temperature the proportions of sugar and dextrin are practically constant. The work of C. O'Sullivan in this department is specially well known. He found that by the action of diastase on starch solution at the temperature of 63° C. the starch was apparently entirely converted into maltose and dextrin, according to the equation—

$$C_{18}H_{30}O_{15}+H_2O=C_6H_{10}O_5+C_{12}H_{22}O_{11}.$$

The same proportions are formed at temperatures near 63°, but for much lower or higher temperatures the equation varies. Wherefore it might fairly be assumed that by acting on starch solution with diastasic solution at 60°–65° for a certain time the diastase strength would be correctly estimated by determining the amount of maltose formed. Two objections occur to the use of the iodine method: (1) it would be difficult to make sure that the starch solution was homogeneous throughout, and so long as any particles remained unconverted by the diastase the blue colour would be developed by iodine; (2) that the end reaction with iodine is not very sharp, the blue colour passing to violet and the latter changing to red-brown, which in turn gradually disappears. On the other hand, the reaction of maltose with Fehling's solution is well defined, so that, *ceteris paribus*, the determination of the quantity of maltose formed would seem the best way of determining diastase.

The experiments next described may help to elucidate the question.

1. The starch solution was in this, as in other cases, prepared by heating 20 grammes of arrowroot with 800 c.c. of water, and diluting to 1 litre. The starch is probably only in a state of quasi solution, not in true solution; the same holding good of other colloid bodies. The malt extract solution was prepared by dissolving and diluting 5 grammes of extract to 100 c.c.; 5 c.c. of this solution were allowed to react with 400 c.c. of the starch solution for half an hour at 55°–58° C., 10 c.c. of strong soda solution being then added, and the whole diluted to 500 c.c. This was then added to 10 c.c. of boiling Fehling's solution, and the amount required to completely reduce noted; 21·5 c.c. were required.

2. The same experiment was repeated, using the same starch solution. The amount required to reduce was again found to be 21·5 c.c.

3. The same experiment was performed, but in place of starch solution, which had been heated just sufficiently to gelatinise, the starch solution was boiled for forty minutes. The amount of extract solution required to reduce was 39 0 c.c.

4. In this experiment a fresh malt extract was used, and the starch gelatinised at 93°–95° C. The test was made with the freshly prepared starch paste. Amount required to reduce the copper solution was 33·0 c.c.

5. Identical with No. 4, except that the starch solution prepared at 93°–95° was kept for forty-eight hours before use. The amount required to reduce was 42·5 c.c.

6. Malt extract solution prepared and experiment conducted as before described, and the starch solution prepared at 90°–95° C. Required to reduce Fehling's solution, 36·0 c.c.

7. Same in all respects, except that only half the quantity of extract was used in the reaction. Required to reduce, 73·5 c.c.

8. Same as experiment No. 6, but in this case the starch solution was boiled for twenty minutes. It required to reduce the Fehling, 57·0 c.c.

9. 125 c.c. of starch solution, as in No. 6, was digested at 38° C. (100° F.) with 5 c.c. of the extract solution, and the point noted when it ceased to give any distinct colour with iodine. Time required was thirty-four minutes.

10. Same as No. 9, except that the starch solution of No. 8 experiment was employed. Time required was thirty-three minutes.

11. 125 c.c. of starch solution was digested with 5 c.c. of the extract solution at about 57° C. until no reaction was given by iodine. Time required was fifteen minutes.

12. Same experiment as No. 11, but digestion was conducted at a temperature of 36°–38° C. Time required was about thirty minutes.

Other experiments were tried, but it would only complicate the question to give further details. The experiments No. 1 and No. 2 show that when the same starch solution is employed, the results obtained by estimating the maltose are constant. The experiments Nos. 2, 3, 6, and 8 show that serious variations are caused in the amounts of maltose indicated, by the use of starch solutions prepared in different ways; the general rule being that when the starch solution has been well boiled, the amount of maltose indicated is much less than when the starch solution has been prepared at a temperature just under boiling. It may be noted here that the starch solution, even when fully boiling, did not attain the temperature of 100°, but only 98° (uncorrected). The experiments Nos. 6 and 7 show that the mass of diastasic matter employed does not appreciably affect the result (within limits at least) when excess of starch is present. The experiments Nos. 9 and 10 indicate that the iodine method gives practically concurrent results, whether the starch has been gelatinised at the higher or lower temperature. These results would seem to show that a slightly boiled starch solution favours the formation of maltose, while a thoroughly boiled solution favours the formation of dextrin. The experiments 11 and 12 confirm what has been previously stated as to the more rapid hydrolysis of the starch at the higher temperature, and show the importance of giving the conditions of experiment, when stating the diastasic value of a malt extract.

The general conclusions are:—

1. That the diastasic value cannot be accurately determined by the amount of maltose formed, unless the starch solution is always prepared in the same way.
2. That there would be great difficulty in fixing a standard method for the preparation of starch solution, such as would ensure a constant result with the same proportion of diastase.
3. That as the method of determining diastase by testing for unaltered starch and erythro-dextrin with iodine is not appreciably affected by the manner in which the starch has been gelatinised, that process must be regarded as the best at present known.
4. That by the action of malt extract on starch solution (2 per cent.) at 40° C., with 1 part of extract to 5 parts of arrowroot, the mixture should cease to give a distinct coloration with iodine after thirty minutes.

This result was obtained with the malt extract used in experiments 11 and 12, and is not an exceptional result for a good extract. In a recently published article* the writer states that he had never found a liquid malt extract of any diastasic value. This does not accord with my experience, as I have on several occasions examined a liquid extract which had been kept for a considerable time, and yet maintained the diastasic power given above as being indicated by a good extract of malt.

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**Mr. Grierson** said he had listened with much interest to this paper, and if he had gathered its tenour aright, Mr. Dott appeared to have altered his mind as to the best method of determining the diastasic action of malt extract. Last year, when he read a paper on this subject, he questioned the reliability of the iodine method, and considered that the best method was to determine the amount of maltose formed, but now he seemed to intimate that the iodine method was the most reliable. He said that thirty minutes was the time required for malt extract to convert its own weight of starch, but with good malt extracts he considered ten minutes was quite sufficient, and he had examined many in which the process was accomplished in five minutes. He saw no difficulty in getting an homogeneous starch solution when working with small quantities such as were used in these experiments. But the kind of starch was most important, and with arrowroot starch a good malt extract ought to convert its own weight in not more than ten minutes. He could corroborate the author's statement that there were many fluid malts in the market which were very active.

The **President** said he regretted Mr. Dott was not present to give further information on this interesting subject.

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* *Pharm. Journ.*, [3], xxiii., 981.

## THE PURITY OF LITHIUM SALTS.

### BY H. BOWDEN.

### *I.—On Lithium Carbonate.*

In lithium salts the lithium may be determined by a nearly similar method in all cases.

The method in general adhered to was as follows:—

To a solution of the salt about eight times its weight of pure crystallised sodium phosphate was added and sufficient caustic soda solution to render the whole decidedly alkaline, and the whole evaporated to dryness on a water-bath. Sufficient water was then added to dissolve the soluble salts, and the whole gently heated and filtered after allowing to stand for twelve hours. The precipitate was washed with a mixture of equal volumes of ammonia and water, and the filtrate and first two washings evaporated to dryness and treated with water as before; any precipitate which falls is added to the bulk. After washing well with ammonia and water, the precipitate is dried at 100° till constant, and is then $Li_3PO_4$. This method is based in general on those proposed by Mayer and by Merling (*Zeitschrif. für Analyt. Chem.*, 1880, 563).

The amount of carbon dioxide was determined by the loss of weight of the samples when treated with an acid. The apparatus used was one made by Mr. Hoseason, of Owens College, and is described in another paper.

Owing to lack of time, only three samples could be determined.

Sample $\alpha$:—

·4854 gramme $Li_2CO_3$ gave ·5072 gramme $Li_3PO_4$.
·3920 gramme $Li_2CO_3$ evolved ·2328 gramme $CO_2$.

| | Theory. | Found. |
|---|---|---|
| Li per cent. ......... | 18·93 | 18·89 |
| $CO_2$ per cent. ......... | 59·45 | 59·38 |

The percentage of lithium found gives $Li_2CO_3$, 99·78 per cent.

Sample $\beta$:—

·6535 gramme $Li_2CO_3$ gave ·6815 gramme $Li_3PO_4$.
·2350 gramme gave a loss in $CO_2$ of ·1391 gramme.

| | Theory. | Found. |
|---|---|---|
| Li per cent. ......... | 18·93 | 18·87 |
| $CO_2$ per cent. ......... | 59·45 | 59·14 |

The percentage of lithium found gives $Li_2CO_3$, 99·68 per cent.

Sample $\gamma$:—

·5723 gramme $Li_2CO_3$ gave ·588 gramme $Li_3PO_4$.
·4235 gramme $Li_2CO_3$ lost ·2513 gramme $CO_2$.

| | Theory. | Found. |
|---|---|---|
| Li per cent. ......... | 18·93 | 18·59 |
| $CO_2$ per cent. ......... | 59·45 | 59·33 |

The percentage of lithium found gives $Li_2CO_3$, 98·2 per cent.

In these analyses the sample was simply dissolved in HCl or $H_2SO_4$, and then the method described at the beginning could be applied.

None of these samples gave a precipitate with ammonium oxalate, therefore calcium was absent.

### *II.—On Lithium Citrate.*

In this salt the lithium may be determined by simply dissolving in water and applying the method at the beginning of the paper.

Only two samples were analysed.

Sample $\alpha$:—

·341 gramme lithium citrate gave ·139 gramme $Li_3PO_4$.

| | Theory. | Found. |
|---|---|---|
| Li per cent. ............ | 7·41 | 7·36 |

The percentage of lithium found gives—

$Li_3C_6H_5O_7, 4H_2O$, 99·32 per cent.

Sample *β*:—

·5875 gramme lithium citrate gave ·2323 gramme $Li_3PO_4$.

| | Theory. | Found. |
|---|---|---|
| Li per cent. ............ | 7·41 | 7·15 |

The percentage of lithium found gives—

$Li_3C_6H_5O_7$, $4H_2O$, 96·49 per cent.

My thanks are due to Mr. Hoseason for the donation of several of the specimens analysed.

The above analyses, owing to want of time, are necessarily incomplete, and unrepresentative on account of their fewness; but the methods give an idea as to the process to be followed.

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The **President** said there seemed no doubt that the samples analysed were chemically pure, and the discrepancies found were undoubtedly due to the water of crystallisation, which the author did not appear to have taken into account.

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Read by Mr. Naylor.

### NOTE ON LITHIUM NITRATE.

BY D. B. DOTT, F.R.S.E.

It was not my intention to contribute a note on this subject at the present time, as I had not yet carried out a complete series of experiments. The solubility of the salt does not seem to have been determined or the exact form of the crystals. Seeing, however, that a paper on lithium salts, by Mr. H. Bowden, was announced for this meeting of Conference, it appeared desirable to communicate this short note.

In the new edition of Watts' 'Dictionary' the formula for hydrated lithium nitrate is given as $LiNO_3{\cdot}5H_2O$, and the salt is said to be obtained by crystallisation below 10°, on the authority of Troost. Dittmar, in his 'Chemical Analysis,' also states that the hydrated salt crystallises below 10°, and is a very deliquescent salt, having the formula $LiNO_3{\cdot}2\frac{1}{2}H_2O$.

I have found that the hydrated nitrate crystallises readily even at 18° C. in long prismatic crystals. These were removed from the mother liquor and dried by pressure in thick blotting paper, then dried in air bath at 110° C.

1·264 gramme lost ·574 gramme = 45·41 per cent.

Of a second quantity of crystals separately dried, ·779 gramme lost ·3475 gramme = 44·4 per cent.

$LiNO_3{\cdot}3H_2O$ requires 43·90 per cent. $H_2O$.

$(LiNO_3)_2{\cdot}5H_2O$ requires 39·47 per cent. $H_2O$.

These results are distinctly in favour of the formula $LiNO_3{\cdot}3H_2O$. The formula given in Watts' 'Dictionary' is evidently an error, the formula $(LiNO_3)_2{\cdot}5H_2O$ being intended, which is the same as that given by Dittmar, but more properly stated. Even allowing for the difficulty of obtaining a deliquescent salt free from adherent moisture, the fact of the crystallised lithium nitrate being a simple tri-hydrate appears most probable.

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Mr. **Symons** said he thought it was quite time this subject was removed from the Blue List. It seemed to be assumed that lithium carbonate of commerce was impure, but every year he examined some scores of specimens, and they almost invariably came out at least 99 per cent. He had not seen a single adulterated sample within the last two years.

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### AFRICAN COPAIBA.

BY JOHN C. UMNEY, F.C.S.

I have already called attention to the principal general characters of this oleoresin as imported from the Niger basin in a preliminary note (*Pharm. Journ.*, [3], xxii., 449), and compared two samples from that source with specimens of South American origin. The results may be briefly summarised thus:—

The African oleoresin is slightly fluorescent, possesses an aromatic piperaceous smell, and has a specific gravity of 0·985 to 1·000 at 15° C. It deposits crystals on standing, and yields on distillation with steam about 40 per cent. of volatile oil.

The oleoresin does not lose its fluidity when heated in a sealed tube to 220° C., a property which distinguishes it from gurgun balsam.

The object of this additional paper is to lay before you the results of a more extended examination of the volatile oil and crystalline and other resins briefly mentioned in that note, and a comparison of them with those obtained from South American copaiba.

#### *Volatile Oil.*

The average yield of volatile oil obtained by distillation with steam from the samples of African copaiba examined was 39 per cent. The oil was of a pale yellow colour, had a specific gravity of ·9185 at 16° C., and a rotation of + 20° 42 with a tube 20 c.m. long at 16° C. It is soluble in its own weight of petroleum ether, in 3 parts of ether, 7 of glacial acetic acid, but is not completely soluble in 50 parts of rectified spirit or absolute alcohol. One hundred grammes of the oil was dried over chloride of calcium, and fractionally distilled with the following result:—

| | | |
|---|---|---|
| Below 260° C. ........................ | Nil. | |
| 260°–265° C. ........................ | 62·3 | grammes. |
| 265°–267° C. ........................ | 9·4 | " |
| 267°–270° C. ........................ | 7·4 | " |
| 270°–273° C. ........................ | 5·0 | " |
| Residue ........................ | 15·9 | " |

The unsuccessful attempts to obtain a crystalline hydrochloride by passing dry hydrochloric acid gas through the oil have been recorded in the previous note, the oil only becoming wine-red and letting fall a non-crystalline deposit. No crystalline product could be obtained, moreover, by passing chlorine through the oil immersed in a freezing mixture.

The dry oil yielded on fractionation over metallic sodium a blue oil boiling at 260°, and agreeing with that obtained by Brix (*Jahresbericht*, 1881, p. 1028) from the Maracaibo variety. It may be noted that this blue oil can only be obtained from the perfectly dry oil, several attempts on the moist oil resulting in failure.

Distilled with bichromate of potash and sulphuric acid a bluish green oil is obtained at 265°, the thermometer falling rapidly.

The original oil reduces rapidly and powerfully a solution of gold chloride in chloroform containing 1 per cent. of absolute alcohol, and the "iodine absorption" in sixteen hours is 251·8.

The fraction boiling at 264° C. was heated for twenty-four hours in the manner described by Wallach (Abst. "Sesquiterpenes," *Pharm. Journ.*, November 12, p. 383) with glacial acetic acid, sulphuric acid, and water, and the dark resulting liquid subsequently distilled in a current of steam. From no fraction, however, on cooling could a crystalline hydrate be obtained. From the fraction of South American copaiba oil, boiling at about 260°, a small quantity of a crystalline hydrate was obtained, agreeing in properties with the sesquiterpene hydrate obtained by the previously mentioned worker. No crystalline halogen compounds could be obtained direct from that fraction of the oil.

To determine whether any similarity in physiological action exists between the oils from the African oleoresin and those hitherto imported from South America I have submitted them to E. Hurry Fenwick, Esq., F.R.C.S., for therapeutic experiments.

This eminent specialist has kindly placed at my service his reports* on picked cases which he has

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* I regret that the details of the reports preclude their publication in a pharmaceutical paper.

*Comparison of Essential Oils.*

| Properties and Tests. | African. | Maracaibo. | Para. |
|---|---|---|---|
| Percentage of Oil. | 39 p. c. | 42 per cent. | A, 80·2 per cent.<br>B, 64·3 per cent. |
| Specific Gravity. | 0·9180. | 0·9052. | 0·9060. |
| Rotatory Power. | +20° 42′ | −34° 18′ | −28° 55′ |
| Solubility at 15° in absolute alcohol. | not soluble 1 in 50. | 1 in 1. | 1 in 1. |
| In petroleum ether. | 1 in 1. | 1 in 1. | 1 in 1. |
| In ether ·720. | 1 in 3. | 1 in 3. | 1 in 2¼. |
| In ether ·735. | 1 in 3. | 1 in 3. | 1 in 2¼. |
| In rectified spirit. | not soluble 1 in 50. | 1 in 19. | not soluble 1 in 20. |
| In glacial acetic acid. | 1 in 7. | 1 in 5. | 1 in 3½. |
| Range of boiling point. | 260°–273° C. | 245°–255° C. | 252°–260° C. |
| Behaviour to dry hydrochloric acid gas in freezing mixture. | Becomes wine-red, turbid, deposits after a time, but no crystals. | Becomes wine-red, turbid, deposits after a time, but no crystals. | Becomes wine-red, turbid, deposits after a time, but no crystals. |
| Digested for 6 hours with metallic sodium and fractionated. | Blue oil, permanent. | Blue fluorescence only. | 262° C., falling to 230°C., green oil. |
| Behaviour to chloroformic gold chloride solution with 1 per cent. absolute alcohol. | Reduces immediately, deposits metallic gold. | Becomes green, no deposit after 1 hour. | Becomes green only, no deposit after 1 hour. |
| Iodine absorption in 16 hours. | 251·8. | 257·9. | 233. |
| Distilled with bichromate of potash and sulphuric acid. | Bluish-green, 265°–267° C. | Bluish oil, rapidly becoming brown (257° C. falling). | Blue colour fades on standing 1 hour exposed to air (252° C. falling). |

treated with the oil in capsules each containing 10 minims. He briefly summarises his remarks thus:—"The oil possesses undoubted therapeutic powers, all the patients, with one exception, acknowledging much benefit from its exhibition. I am told by patients that it is less nauseous to take, repeats less, but is less potent in its effects than the copaiba oil at present in the market (South American). I have used it in prostratic inflammation, fresh and chronic urethritis, stricture, and pyelitis."

### *Resins.*

Reference has been made in the previous communication to the crystalline substance deposited from the crude oleoresin, which by recrystallisation from petroleum ether was obtained almost colourless. The crystals are distinctly acid to litmus, electrical by friction, and melt at 124° C. The lead salt of this acid was obtained as a dense white precipitate by the addition of alcoholic solution of lead acetate to the solution of the acid in the same solvent, but all attempts to crystallise it were unsuccessful. The same difficulty presented itself in the case of the silver salt, but the potassium as well as the sodium compound was obtained in the form of feathery needle-shaped crystals. These properties are similar in many respects to those possessed by the oxycopaivic acid, separated by Fehling from a deposit from the Para variety of the oleoresin.

The residue left after the distillation of the essential oil from which the crystalline deposit had been previously separated, amounting to nearly 60 per cent. of the original oleoresin, was boiled with caustic soda and water. A considerable portion of the resin, amounting to 13 per cent., was not saponified, whilst of a sample of resin obtained from a South American oleoresin only 3 per cent. was unsaponifiable. The solution of the sodium salts of the saponifiable resins was concentrated and set aside, and produced after a short time a small quantity of needle-shaped crystals.

The crystals were separated, washed with water, and dried over sulphuric acid, and proved to be the sodium salt of a resin, differing in several respects from that mentioned above. It is much less strongly acid, and melts somewhat indefinitely at about 150° C. It dissolves with difficulty in absolute alcohol, and forms crystalline sodium and potassium salts, although itself crystallised only with difficulty.

The unsaponifiable portion was readily separated into two distinct resins, one readily soluble in cold petroleum ether, rather darker than canada balsam, and constituting about 1·76 per cent. of the total resin, the other brittle, insoluble in cold petroleum ether, but readily soluble in chloroform, amounting to 0·6 per cent.

From these experiments it will be seen that in many respects the so-called African copaiba corresponds with that imported from South America, and points to the possibility of its being derived from one of the Copaifera which are known to exist in tropical Africa.

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The PRESIDENT said it came as rather a new light to him that any of the copaibas were not brought from tropical America.

Mr. DRUCE thought they had been found in tropical Africa.

Mr. J. RUTHERFORD HILL said he was rather interested in the question of the crystals. The other day a chemist who had been preparing liquor copaibæ brought him about 10 grains of crystals which he said had separated from about 40 ounces of the liquid. They had not been examined, but he suggested that possibly they were a potassium salt of some resin or acid present in the copaiba, and this communication seemed rather to bear that out.

The PRESIDENT said the next two papers would be taken as read, as the figures, without which they would hardly be intelligible, as they were descriptive of new forms of apparatus, were in the hands of the engraver, but they would appear in the Journal in due course.

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## A CHEAP AND USEFUL FORM OF APPARATUS FOR THE GRAVIMETRIC DETERMINATION OF $CO_2$.

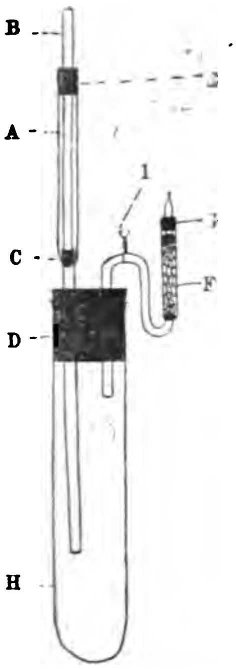
BY J. H. HOSEASON,

*Assistant Lecturer on Pharmacy and Materia Medica in The Owens College, Manchester.*

The chief desiderata of a $CO_2$ apparatus are that it shall be as light as is compatible with its efficiency, and that it shall be cheap and easily constructed.

The apparatus which I am about to describe may be made by anyone with ordinary skill from a broken test-tube or two, a few pieces of glass tubing, a very short piece of indiarubber tubing, and two or three corks. The annexed diagram, together with my description, will render the method of making and the working tolerably clear.

A is a straight tube enlarged at its upper end (easily made from two pieces of glass tubing by joining). In the upper end of A works a glass rod B, which is fitted at its bottom end with a piece of indiarubber tube C. By pushing B gently down the indiarubber tube closes the orifice of A at its contracted portion. A one-holed cork, E, is fitted in the top of A, through which the rod B passes.



F is a tube made somewhat like A and then bent into an S shape; the wider portion is fitted with a one-holed cork G, which is fitted with a piece of glass tubing drawn out to a point. The wider portion of F is packed first with a piece of cotton-wool, then with small pieces of dried calcium chloride, and with some more cotton-wool.

A and F are next fitted into the two-holed cork D, which may then be fitted into the test-tube H.

*To work the apparatus.*—The carbonate is weighed *nto H* and a little water added. Then the cork E is ised and B pressed well down. The acid ($H_2SO_4$, 1 o 2 will do) is introduced into the upper end of A. is then replaced. C now forms a perfect stopper, d no acid can get into H. The apparatus being now tted up, the corks are well pushed in, and a piece of wisted brass wire, I, is fastened to F at its upper nd. The apparatus is then suspended by I from the am of the balance and weighed. B is carefully slid , and the acid flows down the lower end of A on to e carbonate in H. The $CO_2$ passes out of the tube and is dried by the $CaCl_2$. After letting down a tle acid C is always pushed tightly in again. After the carbonate is dissolved, C is slid up a little, and is lifted up and air is drawn through by sucking at e tube in G. C and E are replaced and the contents H gently warmed for a few seconds, and air again drawn through. This may be repeated; the loss in weight gives the $CO_2$ evolved.

This apparatus only weighs about 10 to 15 grammes, and is thus a great deal lighter than those commonly used. The whole may be constructed for a cost of about threepence. Using good corks the instrument is perfectly accurate, and gives as good results as the most expensive forms of apparatus.

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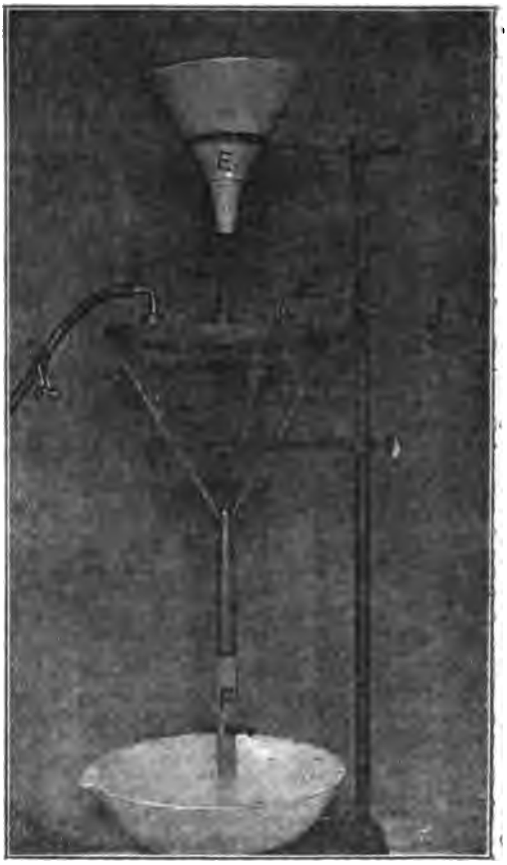
## A WASH-FUNNEL FOR OXIDISABLE PRECIPITATES.

BY J. A. FORRET.

In the *Pharmaceutical Journal* of September 19, 1891, I described a wash-bottle for washing readily-oxidisable precipitates, which piece of apparatus answers perfectly for precipitating oxidisable salts produced by double decomposition. I required, however, a more rapid and thorough elimination of the soluble salt than is obtainable by that means, and have found the funnel arrangement now described suitable for that purpose.



The funnel A is fitted with a perforated metal cone, and covered with a circular piece of wood carrying three glass tubes (B, C, and D), to which are attached india-rubber tubes furnished with spring clips. The wooden cover has also a glazed aperture as large as the diameter of the funnel will admit, to enable the operator to see the contents of the funnel. To the stem of A is fitted a piece of india-rubber tubing (F), into the other end of which a short glass tube is inserted; underneath is placed a beaker or basin of convenient size containing water, under the surface of which the glass tube dips. Into the tube D, the stem of a second funnel (E) is inserted; both funnels are conveniently supported in the rings of a retort stand.

The apparatus is used in the following manner: a piece of fine calico is placed inside the metal cone, and the wooden top cemented to the funnel A, by means of almond meal made into a stiff lute with water, to which a little glycerin has been added. The tube D is closed, and a current of coal-gas, carbonic anhydride, or other suitable gas is passed through the funnel by the tubes B and C, to displace atmospheric air. The precipitate to be treated is poured into the funnel E, and, by means of the clip at D, rapidly transferred to the funnel A. When the bulk of the water has passed through the funnel the tube F is closed by a clip, and the funnel A filled with boiled water through the funnel E. After the lapse of a few minutes the water is run off and the operation repeated till the precipitate is practically free from soluble salt. The tube C is now closed, and the precipitate allowed to drain.

It is desirable to maintain a gentle current of gas while the washing is being carried through; and when the tube C is closed the resulting pressure guards against the entrance of atmospheric air through any flaw in the connections.

Ferrous carbonate is the only salt I have had occasion to treat in this way, the wash-bottle referred to being used to precipitate the carbonate. With some slight modification of the funnel A, however, I believe the above arrangement could be conveniently used both for precipitating and washing such unstable salts as ferrous carbonate, ferrous phosphate, etc.

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### *The Formulary Committee.*

Mr. W. G. **Cross** moved the re-appointment of the present members of the Formulary Committee of the British Pharmaceutical Conference, viz., Messrs. Martindale, Naylor, Abraham, Greenish, Groves, Maben, Martin, Ransom, Reynolds, Symes, and R. Wright.

Mr. **Burden** seconded the motion.

Mr. **Collier** said he had much pleasure in supporting the motion. The book was very serviceable, and was much appreciated by medical men. As pharmacist to one of the largest hospitals in London, he had brought it under the notice of the committee entrusted with the formation of the 'Hospital Pharmacopœia,' which included not only the specialties employed there, but the whole of the preparations in the British Pharmaceutical Conference Formulary, so that it was made familiar to the whole of the students, numbering five or six hundred.

The resolution was carried unanimously.

### *Place of Meeting for* 1894.

The **President** said the next business was to select a place of meeting for next year, and he could not but feel that any town which invited the Conference next year would be placed in a somewhat unfortunate position in coming after Nottingham. They could not expect to receive the same lavish hospitality elsewhere, and he trusted that whatever town it might be the friends there would not feel called upon to emulate what had been done on this occasion, which it would be impossible to expect in a place which might not be one fourth the size.

Mr. **Druce** said it was rather a daring thing for any town to come forward and invite the Conference to visit it after the experience of this meeting. Oxford was a small town, and a poor town, and the pharmacists there were fewer and poorer than in many other places; but communications had passed between the Conference officers and Oxford, the suggestion being that as the British Association would visit Oxford next year the Conference should do so also. To put the matter plainly, however, if the Conference came to Oxford, the members must understand that it would be at their own expense. He did not think they could ask their brethren there to dip very deeply into their pockets, though he had no doubt they would give their assistance, and would be glad to welcome the Conference. He thought there was quite enough of interest in the town and university to prevent the necessity of any long excursion, and although he should be very fully occupied, not only in connection with the meeting of the British Association, but also with the University Extension Scheme and certain examinations, and should not be able to give as much time as he should like, he would be very glad to do all he possibly could.

Mr. **Conroy** asked if it was intended to hold the meeting at the same time as that of the British Association.

The **President** said that must be left for future consideration, with a view to meeting the convenience of their friends at Oxford, if it was decided to go there.

Mr. **Butler** thought it would be a great mistake to meet at the same time as the British Association. He protested against the British Pharmaceutical Conference being attached to the tail of the British Association. The success of the present meeting was almost unique, and they owed it not only to the munificence of the gentlemen connected with the pharmacy and town of Nottingham, but also to the fact that it was not held at the same time as the Britsh Association.

Mr. **Druce** said it would be impossible for Oxford to entertain the Conference at the same time as the Association.

Mr. **Payne** (Belfast) said it was decided last year that the Conference should not in future meet at the same time, or of necessity at the same place as the British Association. He understood the hotel accommodation at Oxford was rather limited, and they should certainly not go there when it was full of other visitors. He found that no less than one hundred and sixty gentlemen had signed the attendance book at this meeting, and there were probably a good many who had not yet signed; this number was above the average for the past ten years. In 1891, the last occasion on which the Conference and British Association met at the same time and place, the number was only one hundred and twelve, a proof to his mind that the change was an advantage to the Pharmaceutical Conference.

Mr. **Druce** having explained that in all probability Oxford would be pretty well occupied until about the end of August with the University Extension movement and the British Association,

Mr. **Wells** asked if any invitation had been received from any other quarter.

The **President** said no other invitation had been received for next year. There was an invitation for the following year from Bournemouth, which would be entirely independent of the British Association.

Mr. **Kemp** (Horncastle) suggested that it should be left to the Executive Committee to decide the place of meeting after careful consideration.

The **President** said the Executive had been in communication with Oxford, and he thought would be in favour of going there.

Mr. **Kemp** (Manchester) said he would propose that the matter be left to the Executive Committee.

The **President** said the Executive Committee was a comparatively small body, and it would be much better for the meeting itself to decide.

Mr. **Gerrard** said the Executive Committee felt gratified at the confidence reposed in it, but it would be much better to settle the matter now. There was no invitation from any other quarter, and he felt that they could not do better than go to Oxford. They did not expect their brethren there to put their hands in their pockets or provide them with board and lodging. They were quite prepared to pay their own expenses, and were willing to go wherever they were welcome on that footing.

Mr. C. Symes then moved that the Conference meet in Oxford next year at the end of August or beginning of September, the exact date to be fixed by the Committee.

Mr. Conroy seconded the motion.

Mr. Grose, in supporting it, said the manner in which each successive town tried to vie with its predecessor in the magnificence of its entertainment had, he feared, led to certain difficulties which he hoped would be removed by its being made perfectly plain that the members of the Conference had no wish to cast a pecuniary burden on the town and neighbourhood which they visited.

The resolution was then put and carried unanimously.

### *Presentation from the Bell and Hills' Fund.*

The President said he had great pleasure in offering, on behalf of the Conference, to the chemists of Nottingham, as a small memento of the kindly way in which they had received the Conference, the books provided by the Bell and Hills' Fund. He would ask Mr. Fitzhugh to accept the volumes, one of which, the 'Pharmacographia,' would in process of time become of great value, not only from its intrinsic merit as a text-book to which they all referred, but as being unattainable in the ordinary course of trade.

Mr. Fitzhugh said it afforded him great pleasure as the representative of the local association to receive these books, and though it would not be necessary to look at them in order to recall the pleasant gatherings they had had, it would be a great pleasure to do so. If the members from a distance had only felt as much pleasure in being there as they had in receiving them he was quite sure they would never look back on their visit to Nottingham with regret. It had been a source of great satisfaction to him that nearly every chemist in the town had responded heartily to the suggestion to invite the Conference. The place of next meeting had been settled, and as to the time, he should be very glad if it could be arranged, as on the present occasion, to precede the meeting of the British Association. It had been a great pleasure to him to work with the chemists of Nottingham in preparing for this meeting, and the thanks of all were due to Mr. Bolton and Mr. Gill, the indefatigable secretaries. He did not mention the names of other members of the Committee because they had all worked most earnestly and amicably; there had not been a dissentient voice from beginning to end.

### *Election of Officers.*

The following officers were unanimously elected for the ensuing year:—

*President*—N. H. Martin, Newcastle-on-Tyne.

*Vice-Presidents*—Michael Carteighe, London; W. Hayes, Dublin; R. H. Davies, London; G. T. Prior, Oxford.

*Treasurer*—John Moss, London.

*Hon. General Secretaries*—W. A. H. Naylor, London; F. Ransom, Hitchin.

*Hon. Local Secretary*—H. Matthews, Oxford.

*Other Members of the Executive Committee*—C. A. Bolton, Nottingham; Peter Boa, Edinburgh; A. W. Gerrard, London; G. C. Druce, Oxford; J. Hodgkin, London; E. M. Holmes, London; J. C. C. Payne, Belfast; E. H. Farr, Uckfield; R. Wright, Buxton.

*Auditors*—John Wilford, Nottingham; W. Clayton, Oxford.

Mr. Reeve said he should like, before the Conference closed, to express on behalf of the Pharmaceutical Society of Australasia his thanks for the kind invitation he had received to attend the meetings, and to congratulate the President on the success of the Conference. In Australia a very deep interest was taken in the proceedings of the Conference. They had watched its progress for many years, many were subscribers to to it, and they read the literature it published with much pleasure and profit. Through watching the progress of pharmacy in Great Britain they had been able to bring about a very satisfactory state of things in Victoria. They could not yet boast of illustrious names in the pharmaceutical arena, names known all over the civilised world, but they hoped to do some day; perhaps, while he was speaking, a budding Redwood was already born, or if not they might hope that he shortly would be. The Conference had been to him a feast of reason and a flow of soul, and he felt deeply grateful for the privilege of being present.

### *New Members.*

The following gentlemen were duly nominated and elected as members of the Conference:—H. N. Davidge, London; C. Tyrer, F.C.S., London; A. J. Symons, New Barnet; W. Mager, Queenstown, South Africa; W. Sharp, Newcastle-on-Tyne; — Cunningham, Dublin; Reuben Widdowson, Nottingham; W. H. Kemp, Horncastle; Ernest Parry, B.Sc., London.

### *Votes of Thanks.*

Mr. J. Rutherford Hill moved:—

> "That the best thanks of the meeting be accorded to his Worship, the Mayor of Nottingham, for the use of the Borough Council Chamber and the Castle Museum during the visit of the Conference."

Very few words were needed to commend this resolution to the unanimous acceptance of the meeting, but he could not help making one general observation. It seemed to him that the whole details of this meeting had been thought out in a singularly perfect way, and that every probable requirement had been amply provided for. This remark applied especially to the use of the Council Chamber and the Museum. He had read the interesting history of that castle before coming to Nottingham, and was much pleased to make acquaintance with it. It had evidently been used for a variety of purposes, many of them of a warlike and some of a doubtful nature, but all would agree that the Corporation of Nottingham had acted very wisely in devoting it to the purpose for which it was now used. He had been at a great many receptions, but never enjoyed one more than on Monday evening.

Mr. Burden seconded the resolution. He said it was a great privilege to live in days when the public were not excluded from visiting ancient buildings, collections of works of art, and places of historic interest.

The resolution was carried by acclamation.

Mr. Fitzhugh, on behalf of the Mayor, said he was very glad to do all he could to further the objects of the Conference, and he only regretted that he could not be present on Monday evening. When he (Mr. Fitzhugh) first asked for the use of the room the Mayor told him to do just as he pleased with that building and the Museum, and to use them as he liked. He was quite sure the Mayor would appreciate this vote of thanks.

Mr. J. Laidlaw Ewing moved:—

> "That the cordial thanks of the non-resident members of the Conference be given to the Local Committee, and especially to Mr. Fitzhugh, the Chairman; Mr. Bolton, the Local Secretary; and Mr. Gill, the Assistant Secretary, for their kind and most successful efforts in organising the present meeting."

Their excellent friend, Mr. Fitzhugh, had received them with very great kindness and cordiality, and they were deeply indebted to him and his estimable lady for all the attention they had shown. They appreciated his position in the town not only as a prominent pharmacist but as one who had filled the honourable office of Mayor of that ancient borough. A local secretary required business tact, foresight, and energy, and in Mr. Bolton these qualities were united in a remarkable degree. To Mr. Gill also they were indebted for his unvarying courtesy and kindness. They had received unbounded hospitality in Nottingham, they had seen the beautiful country surrounding it, and some of those stately English homes which were the pride of the country, and he was quite sure that none of them would soon forget their visit.

Mr. **Conroy** very warmly seconded the resolution, which was carried unanimously.

Mr. C. A. **Bolton** thanked the members very cordially for this expression of thanks for what had been done by the Committee with whom he had had the pleasure of working. A great deal had been said about what a secretary should be, but the Secretary and Committee were very much what the leader and chairman was. They had been specially favoured in having Mr. Fitzhugh as Chairman; he was a man who, when he had anything of this kind in hand, would say "This is the way," and as he went forward the Committee followed him, and all the more readily, as several of them had been trained under him. They had been very much favoured by the weather, which had gone a great way to making the meeting so successful. He might say that there had been no desire to excel anybody else, but simply to give the Conference a genuine Nottingham welcome, and they had been amply repaid for their efforts by the kind appreciation of the members.

Mr. **Gill** also acknowledged the vote of thanks.

The **President** then announced that a cablegram had just been received from Chicago in these terms:—"American Pharmaceutical Association sends heartiest greetings.—Remington."

Mr. J. C. C. **Payne**, J.P., moved:—

> "That the hearty thanks of the Conference be accorded to the President for the able and courteous manner in which he has conducted the business of the meeting."

The President of this year was one whom many had looked forward to meeting with some trepidation, and probably they would have been very glad to get a look at the inside of the bag he was in the habit of carrying to Bloomsbury Square on certain occasions, and examine the botanical specimens he brought up from his own garden in Norwich. Long before he had the pleasure of his personal acquaintance he had heard of his black bag and its contents, but he soon found that he was a very genial man, who, while he wished to examine the students fairly, had no desire to pluck them unnecessarily. In their younger days many were inclined to think that a knowledge of botany was quite unnecessary for a chemist and druggist, but most of them had formed a different opinion now, and he believed all would agree that it was a necessity for a well-educated pharmacist. It gave him great pleasure to propose this resolution.

Mr. **Gerrard** seconded the resolution very heartily. He had been for some years a colleague of Mr. Corder's on the Board of Examiners, and had found him to be a man of warm sympathies, and a thoroughly typical pharmacist. No one could have better represented pharmacy in the chair, and he had done his work with zeal, ability, and impartiality.

The resolution having been put by Mr. Payne and carried unanimously,

The **President** briefly thanked the meeting for the kindness and courtesy which he had met with on all hands, and for the attention which had been given to the proceedings.

## Obituary.

Notice has been received of the death of the following:—

On the 17th of August, G. B. Shaw, Chemist and Druggist, Battersea, late of Pendlebury. (Aged 47).

On the 24th of August, Henry Thompson, Chemist and Druggist, Coatham, Yorks. (Aged 79).

On the 28th of August, Hugh Jones, Chemist and Druggist, Penygroes. (Aged 49).

On the 29th of August, John Richard Hall, Pharmaceutical Chemist, Canterbury. (Aged 70).

On the 31st of August, Thomas Mathias, Chemist and Druggist, Saundersfoot. (Aged 54).

On the 2nd of September, John Smith, Chemist and Druggist, Lincoln. (Aged 51).

On the 3rd of September, George Robert Walton, Chemist and Druggist, Richmond, Yorks. (Aged 73).

## BOOKS, ETC., RECEIVED.

**The Pharmacopœia of the United States of America.** Seventh Decennial Revision (1890). Philadelphia: P. Blakiston, Son and Company. Pp. 603. From the Committee of Revision.

**Manual of Bacteriology for Practitioners and Students.** By Dr. S. L. Schenk. Translated by W. R. Dawson, B.A., M.D. London: Longmans, Green and Co. Pp. i-xiv, 1 to 310. 10*s*. nett. From the Publishers.

**Register of the Institute of Chemistry of Great Britain and Ireland**, and regulations for admission to membership. 1s. From the Secretary.

**Indigestion, Gout, Corpulency, and Constipation, clearly explained, treated, and dieted.** By Thomas Dutton, M.D. Third Edition, Enlarged and Revised. Pp. i-xi, 1 to 220. London: Henry Kimpton. From the Publisher.

**Rivers Pollution Prevention Act, 1893.** Circulars addressed to the County Councils and urban and rural sanitary authorities, by the Local Government Board. From the Secretary.

**British Columbia Pharmaceutical Association.** Report of Proceedings of the Third Annual Meeting. From the Secretary.

**Sur les Végétaux qui produisent le Beurre et le Pain d' O'Dika.** Par M. le Dr. Édouard Heckel. From the Author.

**Report on the Health, Sanitary Condition, etc., of the Borough of Hastings**, for the Quarter ending June 30, 1893. From the Urban Sanitary Authority.

**Wattle Bark.** Report of the Board of Inquiry. Melbourne: Robt. S. Brain. 6*d*. From Baron von Mueller.

**Guy's Hospital Reports for 1892.** Edited by W. Hale White, M.D., and W. H. A. Jacobson, M.A., M. Ch. Vol. xlix. London: J. and A. Churchill. From the Editors.

**Missouri State Pharmaceutical Association.** Report of Proceedings of the Fifteenth Annual Meeting. From the Secretary.

**Schweizerischer Apotheker-Verein.** Festschrift zur Erinnerung an die Fünfzigjährige Stiftungsfeier in Zurich. Pp. 209. From the Secretary.

**Tabulated List and Synopsis of Materia Medica.** By C. Stephan, Pharmacist, Dresden. London: Thomas Christy and Co. From the Publisher.

**University College, Nottingham.** Prospectus for the Thirteenth Session, 1893-4. Nottingham: John Sands. From the Secretary.

*A Caution.*—A correspondent desires to warn his fellow chemists and druggists against a young woman whom he suspects of lifting empty syphons from his syphon stand, and then presenting them at the counter and asking for the return of the deposit claimed to have been paid.

**Communications, Letters**, etc., received from Messrs. Cruickshank, Dott, Eardley, Elborne, Gill, Griffith, Hill, Ingham, Nicholson, Peck, Rawson, Reynolds, Thompson.

## PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

### SEVENTH DECENNIAL REVISION, 1890.

(*Continued from page* 204.)

In the following references to the official articles of the materia medica derived from the vegetable and animal kingdoms, those only are mentioned which are new, or in regard to which some alteration of importance has been introduced. It may be stated that as a general rule the descriptions of drugs are much more precise than in the Pharmacopœia of 1880; tests for identification are given more frequently, and in the statement of characters, as well as in the directions for testing, the use of the term "about" is to be understood as meaning an allowable variation of 2 per cent. either way from the data given. The statement of specific gravities relates to a temperature of 15° C. unless otherwise specified. Many of the changes introduced into the last edition of the German Pharmacopœia have been adopted, and generally the observations published in regard to the natural history and chemistry of drugs since 1880, have received attention from the Committee of revision. In the description of tests for identification and for the detection of impurities, admixtures, etc., it is not stated that the standards of character and purity, so indicated, are to be regarded as authoritative standards. But judging from the care which has been bestowed upon this part of the work of revision, and from the caution displayed in adopting methods of assay for determining the amount of particular constituents of drugs, it may be reasonably inferred that, in regard to the medicinal use of drugs and pharmaceutical preparations, the standards of character and purity implied by the definitions, descriptions, and tests of the Pharmacopœia are to be strictly observed and maintained in the practice of pharmacy.

ACACIA.—The botanical source of gum arabic is now described as *Acacia Senegal*, Wildenow, instead of *Acacia Verek*, Guillemin et Perrottet, and other species of *Acacia*. Complete solubility in water is given among the characters, and, in regard to the powder, absence of starch is to be ascertained by its not giving a blue colour with iodine solution; absence of dextrin by its not giving a red colour with the same reagent.

ADEPS.—The specific gravity is now given as 0·932 instead of 0·938, the melting point 38° to 40° C. instead of at or near 35° C. B.P. 37·8° C. The test for absence of water has been modified by stating that lard, when melted, should not separate an aqueous layer. In addition to the tests given in 1880 the absence of more than a trace of free fat acids is to be ascertained by adding one drop of phenolphthalein solution to 10 grammes of lard dissolved in chloroform and mixed with 10 Cc. of alcohol. This solution is not to require more than 0·2 Cc. of normal potassium hydrate solution to produce a pink colour after strong shaking. Cotton-seed fat is to be tested for with an alcoholic solution of silver nitrate, and absence of more than about 5 per cent. ascertained.

ADEPS LANÆ HYDROSUS.—A mixture of wool fat with 30 per cent. of water, as in the B.P. The melting point of "about 40° C." is the minimum given in the B.P. for anhydrous wool fat, and is higher than that at which the better kind of wool fat melts (35°-36° C). The permissible amount of ash is fixed at 0·3 per cent., and the ash is not to have an alkaline reaction.

ALOE.—In the U.S.P. 1880 the inspissated juice of the leaves of *Aloe Socotrina*, Lamarck, was the only official kind. Now that kind is referred to *Aloe Perryi* (Baker), and the produce of *Aloe vera* (Linné) Webb, has been added under the name of Barbados aloes. For distinguishing between this or Socotrine aloes, and Natal aloes the blue coloration of a sulphuric acid solution of the latter, when nitric acid vapour is blown over its surface, is given as characteristic (*Ph. J.*, [3], xxi., 205).

AMYGDALA AMARA and AMYGDALA DULCIS are now respectively referred to the varieties *amara* and *dulcis* of *Prunus Amygdalus*, De Candolle.

AMYLUM is now defined as the fecula of the seed of *Zea Mays*, Linné. In addition to the tests of U.S.P. 1880, starch is not to yield more than 1 per cent. of ash.

AQUA.—Natural water, the degree of purity of which is more precisely defined than in the U.S.P. 1880 or in the B.P., by the statement that a litre is not to contain more than 0·5 gramme of salts, and that the residue should not carbonise nor evolve ammoniacal or acid vapours when ignited. Neither nitrates nor nitrites should be present. Definite limits for the admissible amounts of sulphates, chlorides, and organic or oxidisable material, are given, together with descriptions of the methods of testing for those impurities.

ASAFŒTIDA.—This drug is now referred to *Ferula fœtida* (Bunge) Regel.

ASPIDIUM.—The sources from which male fern is obtained are now described as *Dryopteris Filix-mas*, Schott, and *Dryopteris marginalis*, Asa Gray.

ASPIDOSPERMA.—The bark of *Aspidosperma Quebracho-blanco*, Schlechtendal; described as flat pieces about 1 to 3 Cm. thick, outer surface yellowish-grey or brownish, deeply fissured; inner surface yellowish-brown or reddish-brown, distinctly striate; fracture displaying two sharply defined strata of about equal thickness, both marked with numerous whitish dots and striæ arranged in tangential lines; the fracture of the outer lighter coloured layer rather coarsely granular, and that of the darker coloured inner layer short-splintery.

BALSAMUM PERUVIANUM.—Now referred to *Toluifera Pereiræ* (Royle) Baillon. In addition to the carbon disulphide test for gurgun balsam and the test for essential oils, the presence of appreciable quantities of storax, turpentine, copaiba, etc., are to be tested for by agitating with benzin, in which case the clear liquid poured off should be colourless or only faintly yellow, and deposit no sediment on standing.

BALSAMUM TOLUTANUM.—Now referred to *Toluifera Balsamum*, Linné. To the characters are added complete solubility in chloroform and in solutions of fixed alkalies, and almost complete solubility in ether.

CALUMBA.—The drug is now referred to *Jateorhiza palmata* (Lamarck) Miers.

CAMPHORA.—Defined as a stearopten having the nature of a ketone. The specific gravity altered to 0·995.

CANTHARIS.—Spanish flies are to be thoroughly dried at a temperature of 40° C. before being bottled.

Carbo Animalis.—An additional test is given for ascertaining whether carbonisation has been complete. In the preparation of purified animal charcoal double the proportion of hydrochloric acid is to be used, and the charcoal is to be twice boiled with the acid in a less diluted state than the U.S.P. 1880 directs. The residue left on incineration is not to exceed 4 per cent.

Cardamomum.—This drug is now referred to *Elettaria repens* (Sonnérat), Baillon.

Caryophyllus.—Now referred to *Eugenia aromatica* (Linné), O. Kuntze.

Catechu.—The portion undissolved by ten parts by weight of alcohol is not to exceed 15 per cent.; the ash is not to be more than 6 per cent.

Cera Flava.—Specific gravity 0·955–0·967. Melting point 63°–64° C. The action of various solvents is defined. The presence of fats, fat acid, or Japan wax, is to be tested for by boiling with a 15 per cent. solution of sodium hydrate, and maintaining the volume of liquid; the wax should separate on cooling, leaving a clear liquid in which no precipitate should be formed on acidifying with hydrochloric acid. Soap is to be tested for by boiling the wax with water and acidifying. Five grammes heated for fifteen minutes with 25 Cc. sulphuric acid to 160° C. is not to give indication of paraffin by the separation of a solid wax-like body when the mixture is diluted with water. An acrolein odour given off on ignition is mentioned as indicating presence of tallow or other fat.

Cetaceum.—The alcoholic solution is to be neutral to litmus paper, and stearic acid is to be tested for by boiling with dry sodium carbonate and alcohol, and adding acetic acid to the filtered solution, which should not give a precipitate, though it may become turbid.

Chirata.—This drug is now referred to *Swertia Chirata*, Hamilton.

Chrysarobinum.—Now defined as the "more or less impure" neutral principle extracted from Goa powder. The melting point is given as 151° C., eleven degrees lower than in the U.S.P. 1880. It is to be almost completely dissolved by 150 parts of boiling alcohol. Mention of chrysophanic acid is now entirely omitted.

Cinchona.—Is now somewhat more precisely defined as the bark of *Cinchona Calisaya*, Weddell; *Cinchona officinalis*, Linné; or of hybrids of these and of other species of *Cinchona* yielding, when assayed by a prescribed process, not less than 5 per cent. of total alkaloids, and at least 2·5 per cent. of quinine. The removal of *Cinchona flava* from the official materia medica is fully justified by the general worthless character of that bark, but the present official description "quills" involves the disadvantage of excluding from pharmaceutical use, without any apparent reason, a large quantity of bark of excellent quality which is imported in the form of shavings or chips.

Cinchona Rubra.—The very low standard of at least 2 per cent. of quinine adopted in 1880 has now been increased to "not less than 5 per cent." of the alkaloids peculiar to this bark, but now without any indication of the proportion of quinine. The very great variation of red bark in this respect has not received sufficient consideration if it be intended that quinine should be a uniform constituent of the bark. In this particular the directions of the U.S.P. 1890 appear to be even less satisfactory than those of the B.P.

Cinnamomum.—In the U.S.P. 1880 cinnamon was defined as the produce of *Cinnamomum zeylanicum*, Breyne, or of other undetermined species grown in China. In the U.S.P. 1890 three distinct kinds are made official. I. Cinnamomum zeylanicum, which is to be used for making Pulvis Aromaticus and Tinctura Cinnamomi. II. Cinnamomum Cassia (Chinese cinnamon), which is to be used in the preparation of Tinctura Cardamomi Composita, Tinct. Catechu Co., and Tinct. Lavendulæ Co., and lastly, III., Cinnamomum Saigonicum (Saigon cinnamon), from an undetermined species, but the use to which this latter kind is to be applied is not mentioned.

Coca.—Included in the U.S.P. 1880 under the name of Erythroxylon. The description of the leaves now given would include both the varieties met with in commerce.

Convallaria.—The rhizome and roots of *Convallaria majalis*, Linné.

Crocus.—The moisture in saffron is not to exceed 14 per cent., and, after drying at 100°, the amount of ash should not be more than 7·5 per cent. Picric acid and some other coal-tar colours are to be tested for by shaking with benzin, which should not acquire a yellow colour.

Cusso.—Included in the U.S.P. 1880 under the name of Brayera, now referred to *Hagenia abyssinica* (Bruce), Gmelin.

Elastica.—The prepared milk-juice of various species of *Hevea*, known in commerce as Para rubber.

Ergota.—Ergot is to be only moderately dried and kept in a closed vessel with occasional addition of a few drops of chloroform to prevent development of insects. Unfit for use when more than a year old.

Eriodictyon.—The leaves of *Eriodictyon glutinosum*, Bentham.

Fœniculum.—Now referred to *Fœniculum capillaceum*, Gilibert.

Glycyrrhiza.—It is mentioned that the drug derived from the variety *Glandulifera* (Waldstein et Kittaibel), Regel et Herder (so-called Russian liquorice), which is now included as official, usually consists of roots or root branches 1 to 4 Cm. thick, 15 to 30 Cm. long, frequently deprived of the corky layer, the wood rather soft, and usually more or less cleft.

Guarana.—This drug is now referred to *Paullinia Cupana*, Kunth.

Illicium.—Star anise is now referred to *Illicium verum*, Hooker filius. Warning is given not to mistake the poisonous fruit of *I. religiosum* for star anise.

Ipecacuanha.—The quality of ipecacuanha, when sound and free from mouldiness, is stated to be "proportionate to the thickness of the bark and the thinness of the ligneous portion."

Jalapa.—Now referred to *Ipomœa Jalapa*, Nuttall.

Lappa.—Now referred to *Arctium Lappa*, Linné, and some other species of *Arctium*.

Limonis Cortex.—The spongy inner layer usually present in the segments is to be removed before use.

Linum.—Ground linseed is to be free from starch, and the filtered infusion, made with boiling water, should not, when cold, give a blue colour with iodine solution.

Lupulinum.—The allowable amount of ash is increased from 8 to 10 per cent.

Lycopodium is not to yield more than 5 per cent. of ash.

Manna.—The filtered solution of five parts, heated with 100 parts of alcohol to boiling, should rapidly deposit separate crystals of mannite.

Matico.—This drug is now referred to *Piper angustifolium*, Ruiz et Pavon.

Mel.—A mixture of recent honey, with 2 parts water, is to have a specific gravity not less than 1·100, corresponding to a specific gravity of 1·375 for the original honey. In clarifying honey it is to be mixed with 2 per cent. of washed paper pulp reduced to shreds, heated on a water-bath as long as scum rises, and the strained liquid mixed with 5 per cent. of glycerin.

Moschus is not to yield more than 8 per cent. of a greyish ash.

Myrrha.—This drug is now referred to *Commiphora Myrrha* (Nees) Engler.

Oleum Adipis.—The specific gravity is altered to ·910–·920. It is to be tested for cotton seed oil with alcoholic solution of silver nitrate, and for paraffin oil by saponification.

Oleum Amygdalæ Amaræ.—Boiling point about 180° C. Optically inactive. Freedom from hydrocyanic acid is to be ascertained. Absence of most other volatile oils and of nitrobenzol is to be ascertained by shaking with cold saturated solution of sodium bisulphite. On heating the mixture for a few minutes on a water-bath the odour should disappear, and a nearly clear solution be formed without separation of oily drops. A further test is given for ascertaining the absence of the artificial oil containing chlorinated products.

Oleum Amygdalæ Expressum.—The presence of fixed oils of apricot, peach kernels, sesamum, cotton seed, or poppy seed, is to be tested for by shaking 2 Cc. with 1 Cc. of fuming nitric acid, when a whitish, not red or brownish, mixture should be formed, separating after some hours into a solid white mass and a scarcely coloured liquid. A further test for olive, arachis, and other fixed oils by saponification is also given.

Oleum Anisi.—Illicium, given as an alternative source of this oil in 1880, is now excluded as a source of this oil. Specific gravity 0·980–0·990 at 17° C. Absence of volatile oils containing phenols is to be ascertained by adding a drop of ferric chloride solution, when the oil should not assume a blue or brownish colour. When dropped into water without agitation the oil should not produce a milky turbidity, indicative of the presence of alcohol.

Oleum Aurantii Corticis.—The fresh peel of the bitter orange, *Citrus vulgaris*, Risso, or the sweet orange, *Citrus Aurantium*, Linné, are given as the alternative sources. Specific gravity about 0·850. Optical rotation not less than 95° to the right for 100 Mm. at 15° to 20° C. Soluble in about four times its volume of alcohol, in all proportions in absolute alcohol or carbon disulphide, and in an equal volume of glacial acetic acid.

Oleum Aurantii Florum.—Referred to *Citrus vulgaris*, Risso. Specific gravity 0·875–0·890. With saturated solution of sodium bisulphite the oil assumes a purplish-red colour.

Oleum Bergamottæ.—Specific gravity 0·880 to 0·885. Optical rotation not more than 20° to the right for 100 Mm. at 15° C.

Oleum Betulæ volatile.—Methyl salicylate obtained by distillation from the bark of *Betula lenta*, Linné; nearly identical with oil of gaultheria.

Oleum Cadinum.—A product of the dry distillation of the wood of *Juniperus Oxycedrus*, Linné; clear brown, thick liquid, with tarry odour; specific gravity 0·990, partially soluble in alcohol, completely in ether, chloroform, or carbon disulphide.

Oleum Cajeputi.—Now referred to *Melaleuca Leucadendron*. Specific gravity 0·922 to 0·929. Heated to 50° C. and gradually mixed with one-fifth of iodine, avoiding further rise of temperature, the oil deposits a mass of crystals on cooling.

Oleum Carui.—Specific gravity 0·910 to 0·920.

Oleum Caryophylli.—Specific gravity 1·060 to 1·067. Tests for ascertaining presence of carbolic acid, petroleum, etc., most fat oils, turpentine, etc., are described.

Oleum Chenopodii.—Specific gravity about 0·970.

Oleum Cinnamomi.—Defined as the oil distilled from cassia cinnamon. Specific gravity 1·055 to 1·065. The distinction formerly made under this head, between oil from Ceylon cinnamon and Chinese oil of cassia, is now omitted. Tests for ascertaining presence of oil of cloves, carbolic acid, petroleum, or colophony are described. The oil is to be soluble in an equal volume of alcohol, and to form a crystalline mass with a saturated solution of sodium bisulphite.

Oleum Copaiba.—Specific gravity 0·890 to 0·910, soluble in ten volumes alcohol instead of an equal weight, as stated in the U.S.P. 1880.

Oleum Eucalypti.—Defined as the produce of *Eucalyptus globulus*, Labillardière, *Ecalyptus oleosa*, F. v. Mueller, and some other species of *Eucalyptus*. Specific gravity 0·915 to 0·925; soluble in all proportions in alcohol, carbon disulphide, or glacial acetic acid. The test described for recognising oil containing a considerable proportion of phellandrene by the solidification with sodium nitrite, suggests that such oil is to be rejected, but that is not stated.

Oleum Gaultheriæ.—The produce of *Gaultheria procumbens*, Linné; specific gravity 1·175 to 1·185. Slightly lævo-rotatory. Oil of wintergreen is described as being nearly identical with volatile oil of sweet birch.

Oleum Gossypii Seminis.—The dark brown colour instantly produced when this oil is brought in contact with concentrated sulphuric acid, the orange or reddish-brown colour and subsequent solidification produced by treatment with nitric acid, and the red or reddish-brown colour developed on shaking with alcoholic solution of nitrate, are given as characteristics of this oil.

Oleum Juniperi.—The produce of *Juniperus communis*, Linné. Specific gravity 0·850 to 0·890.

Oleum Lavandulæ Florum.—The produce of the fresh flowers of *Lavandula officinalis*, Chaix, is the only oil of lavender now official. Specific gravity 0·885 to 0·897.

Oleum Limonis.—Defined as the volatile oil expressed from fresh lemon peel. Specific gravity 0·858 to 0·859; optical rotation not less than 60° to the right for 100 Mm. at 15° to 20° C.

Oleum Menthæ Piperitæ.—Specific gravity 0·900 to 0·920. Tests of identification are described, also for ascertaining the absence of camphor or oil of sassafras, and for the recognition of dementholised oil.

**Oleum Menthæ Viridis.** — Specific gravity 0·930 to 0·940.

**Oleum Morrhuæ** is to be tested for free fat acids and for admixtures of other fish oils or vegetable oil.

**Oleum Myrciæ.**—Specific gravity now given as 0·975 to 0·990. Tests for oil of pimenta, oil of cloves, and carbolic acid are described.

**Oleum Myristicæ.**—Specific gravity 0·870 to 0·900.

**Oleum Olivæ** is to be tested for the presence of cotton-seed oil, sesamum oil, and other seed oils.

**Oleum Pimentæ.**—Specific gravity 1·045 to 1·055. The absence of carbolic acid is to be ascertained.

**Oleum Ricini.**—The absence of other fixed oils is to be ascertained by the tests described.

**Oleum Rosæ.**—Specific gravity 0·865 to 0·880. Tests are described for detecting the presence of oil of ginger grass or Turkish oil of geranium from *Andropogon Schœnanthus*, Linné, oil of geranium from *Pelargonium Radula* (Cavanilles) Aiton, *Pelargonium capitatum* (Linné) Aiton, and *Pelargonium odoratissimum* (Linné) Aiton.

**Oleum Rosmarini.**—The produce of the leaves of *Rosmarinus officinalis*, Linné. Specific gravity 0·895 to 0·915.

**Oleum Sabinæ.**—Specific gravity 0·910 to 0·940.

**Oleum Santali.**—Specific gravity now given as 0·970 to 0·978 (B.P. about 0·96). Lævorotatory, and thus distinguishable from the Australian and the West Indian oils, both of which have also a lower specific gravity. Tests are described for detecting the presence of cedar wood oil, castor oil, and other fat oils.

**Oleum Sassafras.**—Specific gravity 1·070 to 1·090.

**Oleum Sesami.**—Specific gravity 0·919 to 0·923. The green coloration when shaken with an equal volume of concentrated hydrochloric acid, and—after adding sugar—the subsequent development of a blue colour changing to violet and deep crimson, are described as characteristic of this oil.

**Oleum Sinapis Volatile.**—Specific gravity 1·018 to 1·029 (B.P. 1·015 to 1·020). Boiling point 148° to 150° C. (B.P. 147°·8 C.). Absence of alcohol, chloroform, carbon disulphide, petroleum, or fat oil to be ascertained by fractional distillation and by the first and last distillates having the same specific gravity. The absence of phenols is to be ascertained. The formation of thiosinamine (allyl-thiourea) by treatment with ammonia is described as a characteristic for identification, and a quantitative process for determining the amount of thiosinamine obtainable is described as a means of ascertaining the quality of the oil.

**Oleum Terebinthinæ.**—Boiling point 155° to 170° C. (B.P. 160° to 180° C.). Soluble in three times its volume of alcohol. Absence of petroleum, paraffin oil, or resin is to be ascertained by evaporating some of the oil in a capsule on a water-bath, when the residue left should be very very slight.

**Oleum Terebinthinæ Rectificatum**, to be dispensed when oil of turpentine is ordered for internal use, is to be prepared by shaking oil of turpentine with lime water and distilling the mixture until about three fourths of the oil has passed over. Specific gravity 0·855 to 0·865. Boiling point about 160° C.

**Oleum Thymi.**—Specific gravity 0·900 to 0·930. Absence of carbolic acid is to be ascertained.

**Opium** is now to be assayed by extracting with water, evaporating the filtered solution to a small bulk, adding alcohol, ether, and ammonia solution, and digesting for at least six hours. The crystals deposited are then to be collected on a filter wetted with ether, washed with water till free from adherent mother liquor, then with alcohol saturated with morphine, lastly with ether, and weighed after drying at 60° C.

In the preparation of powdered opium the drying is to be effected at a temperature not exceeding 85° C.; the amount of crystallised morphine is not to be less than 13 or more than 15 per cent., a somewhat smaller range than that adopted in 1880.

**Opium Deodoratum.**—This is the name now applied to the *Opium Denarcotisatum* of the U.S.P. 1880. The amount of morphine may vary from 13 to 15 per cent.

**Pancreatinum.**—Defined as a mixture of the enzymes naturally existing in the pancreas of warm-blooded animals, usually obtained from the fresh pancreas of the hog; a yellowish, yellowish-white, or greyish amorphous powder, odourless or having a faint peculiar, not unpleasant, odour and a somewhat meat-like taste. Slowly and almost completely soluble in water, insoluble in alcohol. Complete peptonisation of 400 Cc. of fresh cow's milk is to be effected by 0·28 gramme of pancreatin, so that no coagulation is caused by the addition of nitric acid. The peptonised milk is not to have an odour suggestive of rancidity.

**Pepsinum.**—Defined as a proteolytic ferment or enzyme obtained from the glandular layer of fresh stomachs from healthy pigs; it is to be capable of digesting not less than 3000 times its weight of freshly coagulated and disintegrated egg albumin, and is described as a fine white or yellowish-white amorphous powder, or thin, pale yellow or yellowish, transparent or translucent grains or scales, free from any offensive odour, and having a mildly acidulous or slightly saline taste, usually followed by a suggestion of bitterness. The method to be followed in testing the efficacy of pepsin is described.

Saccharated pepsin is now directed to be a mixture of milk sugar with ten per cent. of the official pepsin, and its digesting power is six times that of the preparation in the U.S.P. 1880.

**Petrolatum liquidum.**—Defined as a mixture of hydrocarbons, chiefly of the marsh gas series, obtained by distilling off the higher and more volatile portions from petroleum, and purifying the residue when it has the desired consistence. Described as a colourless or more or less yellowish, oily, transparent liquid, without odour or taste, giving off when heated a faint odour of petroleum. Specific gravity about 0·875 to 0·945. Absence of fixed oils or fats and of resin is to be ascertained by digesting with solution of sodium hydrate, when the aqueous liquid should not separate oily substance on acidification.

**Petrolatum molle.**—This is the name now given to the softer kind of petrolatum of the U.S.P. 1880. The melting point is now fixed at 40° to 45° C. (B.P. 35° to 40°·5), and it is described as having at the temperature of 60° C. a specific gravity of 0·820 to 0·840.

Petrolatum spissum.—The harder variety of Petrolatum of the U.S.P. 1880. The melting point is fixed at 45° to 51° C.

Pilocarpus.—Of the two kinds of jaborandi leaves the Rio Janeiro kind is now referred to *Pilocarpus Selloanus*, Engler, and the Pernambuco to *Pilocarpus Jaborandi*, Holmes.

Pimenta.—Now referred to *Pimenta officinalis*, Lindley.

Rhus Toxicodendron.—Now referred exclusively to *Rhus radicans*, Linné.

Saccharum is now defined as the refined sugar from *Saccharum officinarum*, Linné, and from various species or varieties of *Sorghum*; also from one or more varieties of *Beta vulgaris*, Linné.

Santonica.—Levant wormseed is now referred to *Artemisia pauciflora*, Weber.

Sassafras.—Now referred to *Sassafras variifolium* (Salisbury) O. Kuntze.

Scilla.—Now referred to *Urginea maritima* (Linné) Baker.

Scoparius.—Now referred to *Cytisus Scoparius* (Linné) Link.

Sinapis alba.—Now referred to *Brassica alba* (Linné) Hooker filius et Thompson. The seed is described as free from starch.

Sinapis nigra.—Now referred to *Brassica nigra* (Linné) Koch. Seed free from starch.

Strophanthus.—The seed of *Strophanthus hispidus*, De Candolle, deprived of its awn.

Tamarindus.—The pulp is to be tested for copper by leaving a piece of bright iron in contact with a portion diluted with water.

Taraxacum.—Now referred to *Taraxacum officinale*, Weber.

Terebenum.—Defined as consisting chiefly of pinene, with only very small proportions of terpinene and dipentene. Specific gravity about 0·862. Boiling point 156° to 160° C. It is to be free from acid, almost optically inactive, and contain only traces of resinous material.

Terebinthina.—The concrete oleoresin is now referred to *Pinus palustris*, Miller, and other species of *Pinus*.

Terpini hydras.—The hydrate of the diatomic alcohol terpin. Described as colourless, lustrous, rhombic prisms, nearly odourless, and having a slightly aromatic and somewhat bitter taste. Melting point 116° to 117° C., losing water when heated; at 258° C. anhydrous terpin distills over, solidifying to a crystalline hygroscopic mass, which melts at 102° to 105° C. Terpin hydrate dissolves in about 250 parts cold water, 32 parts boiling water, in 10 parts cold alcohol, 2 parts boiling alcohol, in 100 parts ether, 200 parts chloroform, or 1 part glacial acetic acid.

Thymol.—A product from the volatile oils of *Thymus vulgaris*, Linné; *Monarda punctata*, Linné; and *Carum Ajowan* (Roxburgh) Bentham et Hooker. Specific gravity 1·069, lighter than water when liquid. Melts at 50° to 51° C. The alcoholic solution optically inactive. The bluish green colour assumed by a solution of thymol in glacial acetic acid, on adding sulphuric and nitric acids, is given as a means of identification, and tests for ascertaining the absence of thymen, or lævogyrate pinene, paraffin, spermaceti, etc., are described.

Triticum.—Now referred to *Agropyrum repens* (Linné) Beauvois.

Viburnum Opulus.—The bark of *Viburnum Opulus*, Linné (cramp bark); the *Viburnum* of the U.S.P. 1880 (black haw) being now distinguished from it as *Viburnum prunifolium*, Linné.

Vinum Album.—Defined as a dry white wine, such as Californian Riesling, Ohio Catawba, etc., containing only traces of tannic acid, and from 10 to 14 per cent. by weight of absolute alcohol. The free acid in 50 Cc. is to be neutralised by from 3 to 5·2 Cc. normal potassium hydrate solution.

Vinum Rubrum.—A dry red wine—claret, burgundy, etc.—is recommended. The specific gravity is not to be less than 0·989 nor more than 1·010 at 15°·6 C.; the free acid in 50 Cc. is to be neutralised by 3 to 5·2 Cc. of normal potassium hydrate solution, and the amount of absolute alcohol from 10 to 14 per cent. by weight.

Xanthoxylum.—Now referred to *Xanthoxylum americanum*, Miller, and to *Xanthoxylum Clava-Herculis*, Linné.

Zea.—The styles and stigmas of *Zea Mays*, Linné. To be used for the preparation of extractum zeæ fluidum; but the formula for that preparation does not appear in the Pharmacopœia.

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## SALOL AS A MATERIAL FOR COATING PILLS.

The difficulty of securing a satisfactory coating of pills with keratin has induced Dr. G. Oeder to make trial of various other substances in its stead, and he has found that salol is well suited for the purpose. The object in view is to provide for the pills passing through the stomach without alteration and being acted upon only when they reach the intestine. Salol has already been recommended as a pill coating for this purpose by Ceppi and Yvon, but they proposed using it in the form of an ether solution. That mode of application was not found to give good results, the deposit of salol upon the pills being too friable and readily rubbed off. Dr. Oeder prefers to apply salol in a melted condition for coating pills, and the operation is carried out in an enamelled sheet iron tray, upon the bottom of which some powdered salol is melted over a spirit lamp or gas flame. The pills are then placed in the tray and rolled in the melted salol, sufficient heat being applied meanwhile to prevent solidification until the surfaces of the pills are coated with a thin layer. The heating is then discontinued and the rolling of the pills kept up for about one minute until they have sufficiently cooled. For thirty pills of average size the quantity of salol requisite is from a gramme to a gramme and a half, but if the pills are not sufficiently coated in one operation the treatment must be repeated. The pills should have a uniform translucent coating, free from cracks or bare places, and the quantity of salol on each pill need not exceed two centigrammes. Dr. Oeder states that he has succeeded in obtaining a sufficient coating with as little as five milligrammes, and even in the case of the largest sized pills the salol coating need not exceed one decigramme. In carrying out the operation the chief point to be observed is to avoid heating too much, as that would have the effect of decomposing the salol. The low melting point of salol (40°–43° C.) facilitates the operation, and if that temperature is not exceeded the substance may be repeatedly melted without undergoing alteration.—*Pharmaceutische Zeitung*, xxxviii., 527.

## PHARMACEUTICAL EDUCATION IN GREAT BRITAIN.

### LONDON.

The School of Pharmacy of the Pharmaceutical Society of Great Britain enters upon its fifty-second year of existence at the opening of the coming session. Founded in the year 1842, as a means of providing a sound education in the scientific principles on which the practice of pharmacy is based, it has been consistently developed during the past half century by the Council of the Society, so that it has at all times afforded a complete scientific curriculum, for the time being, for pharmaceutical students. There are now separate departments, each complete in itself, of Chemistry, Practical Chemistry, Botany, Materia Medica, and Pharmacy. Chemistry, including Physics in their relation to Chemistry, is taught by Professor Dunstan, assisted by Mr. E. F. Harrison, and there are two distinct courses of lectures (the second for advanced students) delivered during the session. Instruction in the Chemical Laboratories, which are open daily, is directed by Professor Attfield and Mr. F. W. Short, and here again there are both Junior and Senior Courses. The lectures on Botany, by Professor Green, deal, in the first course, with the Morphology and Anatomy of Plants, including the Vascular Cryptogams, and also embraces the leading facts connected with their Physiology and mode of life. In the second course, the phenomena of reproduction are considered in detail, together with the principles of classification and the peculiarities of the chief British Natural Orders. Classes in practical work are arranged as convenient, the study of plant histology by the aid of the microscope being a prominent feature. Materia Medica and Histology are in charge of Professor Greenish, who, in addition to lectures, conducts demonstrations in the newly-fitted Histological Laboratory, whilst the Theory and Practice of Pharmacy are taught by means of lectures and demonstrations by Mr. Joseph Ince. Systematic instruction in Dispensing and Practical Pharmacy is afforded in the Pharmaceutical Laboratory. Students who have passed the Major Examination are eligible for admission to the Research Laboratory where, under the direction of Professor Dunstan, they may obtain instruction in the methods of research and undertake special investigations. The Society's Library, Reading Rooms, and Museums are all available to students who are connected with the Society. Applications for prospectuses and further information respecting the school should be addressed to the Secretary, Mr. F. W. Short, 17, Bloomsbury Square, W.C. Students wishing to further extend their general knowledge of the various sciences may attend the lectures and laboratories at the Royal College of Science—Biology, Professor Huxley and Mr. Howes; Chemistry, Dr. Thorpe and Mr. Wynne; Physics, Professor Rücker and Mr. Boys. Evening classes in the same sciences are held at the Birkbeck Literary and Scientific Institution, King's College, the City of London College, and other similar institutions. At King's College, also, there are evening courses in General Bacteriology and the Bacteriology of Fermentation, which are well worth the attention of pharmacists. The Bacteriological Laboratory, conducted by Professor Crookshank and Dr. Hewlett, is always open, and special arrangements for study can be made at any time. Further particulars of the different classes may be obtained of Dr. Hewlett, at the College.

## PROVINCIAL.

### ABERDEEN.

Arrangements have been made by the Aberdeen and North of Scotland Society of Chemists and Druggists to have their laboratories and museum in Bridge Street open daily for practical work. Elementary Chemistry and Botany are taught at Robert Gordon's College. A class in Practical Chemistry is conducted by Mr. H. T. Jones, at the Society's rooms, and others in Materia Medica and Pharmacy are in charge of Mr. Pennie. Information concerning these classes may be obtained from the Secretary, Mr. A. Strachan, 138, Rosemount Place, Aberdeen. In connection with the Faculty of Medicine of the University of Aberdeen, classes are held in Inorganic and Organic Chemistry, Materia Medica, Botany, and Physics. The Chemical Laboratory is open daily, a Pharmacological Laboratory affords opportunities for research, there is a class for practical laboratory work in Botany twice weekly, and the Botanical and Materia Medica Museums contain extensive collections of specimens. Intending students must fill up schedules, to be obtained from the Librarian, Marischal College.

### ABERYSTWITH.

At the University College of Wales, Aberystwith. Professor Snape lectures on Chemistry, and the Chemical Laboratory is open daily. Special arrangements will be made for medical or pharmaceutical students, if required, the hours for practical work being arranged to suit the individual requirements. Application should be made to the Registrar.

### BANGOR.

Lecture courses on Chemistry (Professor Dobbie), Physics, and Botany are conducted at the University College of North Wales, Bangor, and are recognised for medical graduation in the Universities of Edinburgh and Glasgow. There is a Chemical Laboratory also, open on five days of the week, for instruction in Chemical Analysis and in the Application of Chemistry to Medicine, etc. Particulars may be obtained of the Registrar.

### BIRMINGHAM.

The Council of the Midland Pharmaceutical Association hopes to be able to arrange for a series of lectures to be delivered at the Mason College. Meanwhile, students can profitably spend their first and second years at the Midland Institute, and the third at Mason College. At the Midland Institute there are Elementary and Advanced Courses in Inorganic and Organic Chemistry (Theoretical and Practical), Experimental Physics, and Botany. At the Mason College the Chemical Lectures and Laboratory are under the control of Professor W. A. Tilden, and Botany is practically and experimentally taught by Professor Hillhouse. Materia Medica and Pharmacy are in the hands of Mr. John Barclay, and there is also a class in Chemical Physics, whilst the Herbarium, Materia Medica Museum, Pharmaceutical and Bacteriological

Laboratories are of great value in enabling students to acquire practical experience. Syllabuses may be obtained from the Secretaries of the respective institutions.

### BRADFORD.

The Calendar of the Bradford Technical College gives particulars of Evening Classes in Elementary and Advanced Inorganic Chemistry; Organic Chemistry, Theoretical and Practical; Qualitative and Quantitative Analysis; Botany, and Organic Materia Medica. The last two are conducted by Mr. William West, and are specially adapted to the requirements of pharmaceutical students. Laboratory practice may also be had at the College, and the fees are extremely moderate. Application may be made to the Secretary.

### BRIGHTON.

At the Municipal School of Science and Art, Brighton, there are several suitable classes for pharmaceutical students. Inorganic and Organic Chemistry are taught, both theoretically and practically, whilst Botany and Materia Medica are also included in the syllabus. The prospectus will be sent on application to the Secretary, Grand Parade, Brighton.

### BRISTOL.

Evening courses are conducted at University College, Bristol, in Elementary and Advanced Chemistry (Professor Young), Chemical Physics, and Botany (Professor Leipner). The Botanical Garden is open to students to aid them in their studies. Day Classes are held in Inorganic and Organic Chemistry, Experimental Physics, and Botany, the Chemical Laboratory is open daily, and there is also laboratory instruction in Physics and Botany. Materia Medica and Practical Pharmacy form part of the scheme of study in connection with the Faculty of Medicine of the College. Further information will be supplied by the Secretary of the College.

### CAMBRIDGE.

At Cambridge, Botany is taught in connection with the Science and Art Department, but Chemistry and Physics are not as yet dealt with. It is hoped that, in course of time, special classes may be organised in connection with the recently instituted Pharmaceutical Association.

### CARDIFF.

Similar courses to those at Bangor are arranged at the University College of South Wales and Monmouthshire, Cardiff. There are lectures on Inorganic and Organic Chemistry (Professor C. M. Thompson), Qualitative and Quantitative Analysis, Physics, and Botany, and the Chemical Laboratory is open daily. There are also special courses of lectures on Chemistry, Physics, Materia Medica, and Pharmacy, in connection with the Faculty of Medicine. The Registrar will furnish a copy of the syllabus on application. Evening Classes are conducted at the Borough Technical School, in Physics, Inorganic and Organic Chemistry, with laboratory practice, at merely nominal fees. Apply to the Secretary for details.

### CHESTER.

At the Chester School of Science and Art, classes are announced in Inorganic Chemistry (Theoretical and Practical), Botany, and Physics. A copy of the Prospectus will be sent on application to the Clerk to the Governing Body, Grosvenor Museum, Chester. The Materia Medica collection, belonging to the Chester Chemists' Association, is said to be of great service to students, and hopes are expressed that the departments of Chemistry and Pharmacy may show signs of improvement.

### DUNDEE.

Classes for the first Pharmaceutical Examination are held at University College, Dundee, and the Chemistry classes and laboratory instruction (Day and Evening) there provided are also suitable for pharmaceutical students. Dispensing, Materia Medica, and Practical Pharmacy are taught at the Royal Infirmary, by Mr. Wm. Mair. Particulars may be obtained of the College Secretary.

### EDINBURGH.

In the Pharmaceutical Society's Calendar (page 242) it is stated that pharmaceutical students are admitted on special terms to certain of the courses of Lectures on Botany, Chemistry, and Materia Medica, and of practical instruction in Chemistry, recognised by the University of Edinburgh, and the Royal Colleges of Physicians and Surgeons, Edinburgh. At the Heriot-Watt College there are classes in Chemistry and Physics, with laboratory instruction in both. There are also Evening Classes in Theoretical and Practical Chemistry (Professor Gibson), Physics, and Botany (Mr. J. A. Thomson), with special arrangements for medical and pharmaceutical students in Practical Chemistry. Other classes in the same subjects may be attended at the University of Edinburgh, and special pharmaceutical classes, in all the essential subjects, are conducted by Mr. William Duncan, aided by competent assistants, at the Royal Dispensary, under the control of the Board of Managers. The Pharmaceutical Society's Library, Reading Room, and Museum, are at the service of all students connected with the Society. Full details may be obtained on application at the respective institutions, or of Mr. J. Rutherford Hill, Assistant Secretary to the Pharmaceutical Society, 36, York Place, Edinburgh.

### GLASGOW.

No arrangements have been made for the coming session by the Council of the Glasgow Pharmaceutical Association, but lectures are given on Chemistry (Professor Watson), Physics, Botany, and Materia Medica at Anderson's College, and the Chemical Laboratory is open daily. Similar arrangements exist at St. Mungo's College, where there is a recently-equipped Bacteriological Laboratory, and the practical work in Botany includes work with the microscope. Day and Evening Classes are also held at the Glasgow and West of Scotland Technical College, and special arrangements are made for pharmaceutical students in connection with the courses in Inorganic and Organic Chemistry, and Laboratory Instruction, held at the Grove Street Public School.

### LEEDS.

The prospectus of the Yorkshire College, Leeds, shows that there are Day Classes in Physics (Professor Stroud); Inorganic, Organic, and Applied Chemistry

(Professor Smithells); and Elementary and Advanced Descriptive and Systematic Botany (Mr. H. Wager). In addition, courses of practical work are conducted in the Physical, Chemical, and Biological Laboratories. There are also Evening Classes in Chemistry. Particulars may be obtained of the Registrar and Secretary. The Leeds School of Science and Technology has Day Classes for Practical Chemistry and courses of Evening Lectures in Chemistry (Inorganic, Organic, and Practical), Physics (Elementary and Practical), and Botany (Elementary, Advanced, and Practical). The practical work in Botany includes section cutting, staining, and mounting, microphotography, and field excursions. The fees are very low, and further particulars may be obtained of the Secretary.

### LEICESTER.

In the prospectus of the Leicester Technical School particulars are given of Evening Classes in Inorganic, Organic, and Practical Chemistry (Mr. J. Mansell), Physics, and Botany (Mr. G. H. Storer). The fees are very low, and it is announced that special arrangements will be made for students attending the Chemical Laboratory who may be preparing for the professional examinations of the Pharmaceutical Society.

### LIVERPOOL.

At University College, Liverpool, there are Day Classes in Physics (Professor Oliver Lodge); Inorganic, Organic, and Physical Chemistry (Professor J. Campbell Brown); and Botany (Mr. R. J. Harvey Gibson), including Morphology and Classification, Histology, Comparative Physiology, etc. Laboratories are open daily in the different subjects, as well as the Museum and Herbarium, and a special composition fee is charged to pharmaceutical students attending the appropriate lecture course in Chemistry, accompanied with five months' laboratory work. Evening classes are held in Physics, Chemistry (including Qualitative Analysis), and Botany. Applications should be addressed to the Registrar.

### MANCHESTER.

Very complete arrangements are made at the Owens College, Manchester, to meet the needs of local students in pharmacy. In the prospectus of the Pharmaceutical Department, students are strongly advised to pass the Preliminary Examination in Arts before entering on the College courses, and then to attend the following lectures and practical classes to prepare for the qualifying examination:—Chemistry, Botany, Materia Medica, Pharmacy, and Pharmaceutical Chemistry, together with lectures on Pharmacy Law. For the Major course, classes are arranged in Botany and Materia Medica (lectures and practical), and laboratory courses in Organic and Pharmaceutical Chemistry. Chemistry is taught by Professors Dixon and Perkin, Botany by Professor Weiss and Mr. Hick, Materia Medica by Professor Leech and Mr. Kirkby, Pharmacy and Pharmaceutical Chemistry by Mr. Hoseason, and Pharmacy Law by Mr. Kirkby. An entrance exhibition of £10 will be offered for competition in October, 1893, to students entering for the full Pharmaceutical course (Minor and Major examinations). The subjects of the examination will be Elementary Botany and Chemistry. Candidates must give notice to the Registrar of their intention to compete on or before September 20. A scholarship of £10 and a prize of £5 will be offered at the end of the Winter Session (1893–4) for competition among students proceeding to the course for the Major examination. The awards will be made on the results of the examinations in the course for the Minor examination The College Prospectus will be sent on application to the Registrar.

### NEWCASTLE-ON-TYNE.

The North of England Pharmaceutical Association has arranged with the authorities of the Durham College of Science to conduct classes on similar lines to previous years. Professor M. C. Potter will lecture on Botany, the course being specially designed to meet the requirements of pharmaceutical students, and there will be laboratory work on the same subject, practical instruction being given in the use of the microscope in vegetable histology. Chemistry will be dealt with by Professor P. Phillips Bedson, who will have several assistants in the laboratory to supervise the work of the students, the needs of pharmacy students being again kept prominently in mind. Mr. N. H. Martin will lecture on Materia Medica and Pharmacy. Though none of the fees are high, students who are connected with the local Association will be admitted to the Chemistry lectures at a reduced fee, and they will also have the use of the Library and Museum of the Association. Application for further information should be made to the Secretary of the Durham College of Science, Barras Bridge, Newcastle-on-Tyne.

### NOTTINGHAM.

The Council of the Nottingham and Notts Chemists' Association has made arrangements for a complete three years' course of instruction, suitable for pharmaceutical students, to be given at the University College, Nottingham. During the coming session there will be a course of lectures on Pharmaceutical Chemistry by Professor Clowes, accompanied by laboratory practice; a course on Elementary Organic Chemistry by Mr. R. L. Whitely; one on Materia Medica by Dr. C. Haydon White; and a fourth, on Physics, by Professor Heaton. Pharmaceutical Botany and Practical Dispensing also receive due attention, and the curriculum is so arranged that students may take the complete course in the three years. The classes are held during the evenings, and the fees are extremely moderate. Mr. William Gill, Honorary Secretary of the Association, 207, Radford Road, Nottingham, will furnish any further information that may be required.

### SHEFFIELD.

The next session of the Sheffield School of Pharmacy, promoted and supported by the Sheffield Pharmaceutical and Chemical Society, will be inaugurated by an address from Mr. John Harrison, J.P., of Sunderland. All the classes are specially designed to advance the technical education of students in pharmacy. The lecturer on Botany and Materia Medica is Mr. J. Austen, whilst Theoretical and Practical Chemistry are taught by Mr. J. C. Platts. The fees here again are practically nominal, and students are entitled to make use of the Library and Museum belonging to the Society. The Secretary of the School will answer any inquiries addressed to New Surrey Street, Sheffield.

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, SEPTEMBER 16, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE INTERNATIONAL PHARMACEUTICAL CONGRESS.

THE reports of the proceedings at Chicago appearing in the American pharmaceutical journals which have come to hand are not very much more comprehensive than that we published last week, and they are of such a nature as to confirm the conclusion we then arrived at as to the importance of the affair. We now learn, however, from the report in the *American Druggist and Pharmaceutical Record* that the presentation of the HANBURY medal took place at the first afternoon session of the Congress. That was in fact the chief incident of that day's proceedings, after the organisation of the Congress and the appointment of officers. The original intention that the medal should be presented by the President of the Congress was not carried out, and the presentation was made by Mr. CARTEIGHE, as President of the Pharmaceutical Society of Great Britain, the medal being received by Professor REMINGTON for transmission to Professor MAISCH. We regret very much that the condition of Professor MAISCH is still such as to cause serious apprehension, but it is some gratification to learn from Professor REMINGTON'S remarks that the circumstance of the award was known to Professor MAISCH, and that an expression of appreciation of the honour conferred upon him was received by telegram. The award of the HANBURY medal is spoken of in several of the American journals as having been highly pleasing to the numerous friends and admirers of Professor MAISCH.

The other proceedings of the Congress fell far short of dealing with the imposing array of subjects drawn up under the four sectional divisions, of which a general summary was given in the Journal of the 13th of May last. The important section of history and ethics appears to have been given up altogether. The project of an international pharmacopœia is so much a part and parcel of the existence of the Congress that a discussion of it was inevitable, though little progress has been made beyond the ideal stage in which the project was left by the London Congress in 1881. The impracticable nature of the more extended scheme, which finds favour with some pharmacists was demonstrated by Mr. CARTEIGHE, who advocated a limitation to potent remedies consistent with that suggested by the late PETER SQUIRE, at the London Congress. After some discussion, in which Mr. MARTINDALE supported the adoption of a uniform international standard for strong preparations, a commission consisting of Professor REMINGTON, Mr. CARTEIGHE, and Mr. VON WALDHEIM, was appointed to take charge of the subject.

The subjects of pharmaceutical education and legislation were taken up at the third session of the Congress, and considerable diversity of opinion was expressed in the discussion of them. However, some formal resolutions were passed (see page 230) approving the principle that a compulsory curriculum of scientific and practical training is indispensably necessary for ensuring the competent qualification of persons practising pharmacy. The last session of the Congress was partly taken up with a somewhat discursive discussion of the relations of pharmacists to public sanitation, and the subject of adulteration, in which opinions were much at variance, and the matter was finally entrusted to a committee to report upon it to a future Congress. The perennial topic of patented and trade-marked specialties was also discussed, but without any definite result being arrived at. The work of the Congress was concluded by votes of thanks to the American Pharmaceutical Association, the Committee of Arrangements, the druggists of Chicago, and the Illinois State Pharmaceutical Association, for the part they have taken in connection with the Congress.

## PHARMACEUTICAL EDUCATION.

THE fifty-second session of the Society's School of Pharmacy will be opened on Monday, October 2, at 3 p.m., when the PRESIDENT is expected to distribute the prizes to the successful candidates among the students of last session, and an inaugural address will be delivered to the new comers by Dr. T. LAUDER BRUNTON, F.R.C.P., F.R.S. A few days later an address will be delivered at the re-opening of the Sheffield School of Pharmacy by Mr. JOHN HARRISON, J.P., of Sunderland, Member of the Council of the Pharmaceutical Society, and with or without similar ceremonies the educational machinery provided by provincial associations will be started afresh throughout the whole kingdom. In prospect of this we have for some time past been making enquiries as to the facilities existing in the provinces for the education of pharmaceutical students, and a summary of such information as we have been able to collect will be found at page 226. It will be seen that practically all parts of Great Britain are represented in our list and, further, that probably no place is so remote from a teaching centre, but that with an effort students may place themselves under proper guidance to obtain, during the period of pupilage, at least a ground-work of instruction in the sciences upon which their art is based. In places where a school of pharmacy, college, or medical school does not exist, there will probably be science classes conducted during the winter session, under the auspices of the Science and Art Department or of some local authority.

Of course, when special facilities are afforded for instruction from a purely pharmaceutical point of view, as in the case of Sheffield, Nottingham, Manchester, Newcastle, and other places, the advantages may be exceptionally great; but the position taken by those who claim that nothing but "pharmaceutical chemistry" or "pharmaceutical botany," whatever they may be, should be taught to pharmaceutical students, is a distinctly untenable one. The elementary training in any science cannot be too general and, if it be thorough, the fit application of the principles taught will be readily made by intelligent pupils as they daily engage in the practice of the art which they propose to follow. At the same time, when a systematic course of instruction is subsequently undergone at such an institution as the Society's School of Pharmacy, as invariably ought to be the case prior to examination, the previous non-specialisation of scientific studies will be found an advantage rather than otherwise. Again, it is frequently urged that apprentices are not able to pay the fees demanded by educational institutions, and claims for reduction are often made and conceded on their behalf. But, if pharmacy is ever to rank as an important profession, those who intend to practise it must be prepared to stand on a similar footing to those proposing to occupy other professional positions. Anything like equality in status between professional bodies is quite out of the question if eleemosynary education be accepted by candidates who seek admittance to the ranks of any of them. What is worth having is worth paying for, as a matter of policy, and the pharmaceutical student cannot afford to pay less in proportion for his professional training than the medical or legal student.

As regards future prospects, everything points to the eventual necessity of a compulsory curriculum in pharmacy. However much one would like to believe that the individualistic position, pure and simple, is the correct one, the careful consideration of facts teaches that some measure of compulsion is essential if the true position of pharmaceutical practice is to be conserved or advanced. Instances may be freely cited where men have gained leading positions without undergoing collegiate training, but they are too few to efficiently leaven the mass and induce the majority voluntarily to fit themselves for something better than they are likely immediately to attain under the too frequently prevailing conditions of trade. As we are able to show, the means of acquiring knowledge are not wanting; but examination statistics prove only too clearly that such opportunities are not utilised as they ought to be. The question arises therefore whether future progress in pharmacy is to be voluntary or the reverse. Mr. CARTEIGHE, speaking at the recent International Pharmaceutical Congress, is reported as saying that the establishment of an enforced curriculum would come either from within or without, either through the efforts of pharmacists themselves or through the public, by governmental action, and it is noteworthy that, after full discussion of the subject, as reported by the *Pharmaceutical Era*, the following recommendations were finally adopted by the Congress:—

1. No student should be admitted as apprentice by a pharmacist unless such student has passed a satisfactory preliminary examination, in such subjects of general education as may be best suited to the requirements of the several countries not yet having enforced such requirement of compulsory education, and that such a student's time of apprenticeship shall date from the time of the examination.

2. The total duration of apprenticeship should not be less than four years, including the time of attending a college or school of pharmacy.

3. Inasmuch as pharmacists have observed the inadequacy of such a method of determining the qualification for the practice of our art as consists simply of a stated examination, and believing that through no single examination, no matter how thorough nor how capable the examiner, can the status, the knowledge, practical usefulness and value of applicants for the important privilege of dispensing drugs and in compounding medicines be fairly arrived at; and further, that pharmacy no less than other scientific pursuits requires systematic, persistent, and continuous training.

Therefore, be it resolved, that this congress approves of the recognition of the principle of a compulsory curriculum; that no person should be entitled to become registered as titled or qualified pharmacist without having prosecuted a systematic course of instruction in the various branches of pharmaceutical science.

Resolved, further, that every delegate be requested to use his influence with his society for the promotion of this principle of such paramount and fundamental importance to pharmacy.

Further discussion of the point is doubtless inevitable before the principle obtains legal sanction either in this country or in the United States; but there seems little hope for the proper development of the profession of pharmacy, on either side of the Atlantic, until it is fully and freely recognised that satisfactory proof of efficient, scientific and practical training should be the indispensable condition of admissibility to the examination by which legal qualification to practise as a pharmacist is obtained. Pharmacists will do well to be the first to recognise this, and their ready acceptance of the position will go far to establish that public confidence in their ability, which has been but a slow growth in the past, and is not yet too firmly grounded.

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### COMPLIMENT TO PROFESSOR ATTFIELD.

The Schweizerische Apotheker-Verein, on the occasion of the fiftieth anniversary of its foundation, has elected Professor Attfield to its honorary membership, "in recognition of his merits in respect to the advancement of scientific pharmacy." We believe this is the twenty-second similar compliment the Professor has received within the past twenty-five years.

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### HANBURY MEDALLION AT KEW.

A medallion portrait of the late Daniel Hanbury has been presented to the museum of the Royal Gardens, Kew, by Mrs. Woolner. It is the original plaster model prepared by the late Thomas Woolner, R.A., and is said by the *Kew Bulletin* to be a faithful likeness. Surrounding the portrait the flat surface is ornamented to represent the *Liquidambar orientale*, Mill, which Hanbury proved to be the source of liquid storax, and *Ipomœa simulans*, which he discovered and showed to be the source of Tampico jalap.

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### PATHOGENIC BACTERIA IN PLANT TISSUES.

It has been shown by Lominsky that the specific organisms of anthrax and typhoid, and the *Staphylococcus pyogenes aureus*, can exist and multiply in plant tissues. Spore formation occurred when the first-named was inoculated into certain leaves and the bacteria, removed from the leaves after a stay of six weeks, maintained their virulence unimpaired, as proved by inoculating animals. Dr. H. L. Russell (*Johns Hopkins Hospital Reports*) also concludes, as the result of numerous experimental inoculations of healthy plants, that a considerable number of different species of pathogenic and non-pathogenic bacteria can withstand the action of the living plant organism for a considerable length of time. Many species were able to live in the plant for more than eighty days, and were able to spread throughout the tissues to a limited extent.

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### MEDICINE STAMP DUTY.

According to the thirty-sixth report of the Commissioners of Inland Revenue, just published, the net receipt on the sale of stamps for medicinal preparations, for the year ending March 31 last, was £220,325, being a decrease of £19,737 as compared with the receipt for the preceding twelve months.

### REPORT ON EPIDEMIC INFLUENZA.

This report to the Local Government Board, by Dr. Parsons, deals with the epidemics of 1889-90, 1891, and 1891-2, and is preceded by an introduction by the medical officer of the Board. Dr. Thorne Thorne states that the further experience obtained goes strongly to confirm the view that the disease is essentially propagated from person to person, the evidence now forthcoming tending to show that it has followed the lines of human intercourse rather than that "atmospheric causes" have constituted the prevailing factor. As the result of Dr. Klein's investigation one prominent lesson is said to seem to be indicated, viz., that the sputa of the sick are invariably charged with the micro-organism which is pathognomic of influenza, and the hope is expressed that when these sputa come to be recognised as infectious and are dealt with accordingly, the spread of the disease from person to person may be controlled. The report is very extensive and includes statistical studies and particulars of the course of the epidemics in England and Wales; the history of influenza abroad; considerations respecting the etiology of influenza; clinical features of the later epidemics; reports on outbreaks in certain institutions; the prophylaxis of the disease; and Dr. Klein's report on its clinical and pathological aspects. The book is illustrated by fourteen plates, including forty-six illustrations, mostly prepared from photographs by Mr. E. C. Bousfield. Several of these are coloured, and they form a highly instructive contribution to the etiology of influenza.

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### THE KEW HERBARIUM.

This herbarium has recently been enriched by the addition of forty-six dried specimens of ferns, collected in Sarawak, and including six new species; two hundred species of plants collected by Sintenis in Kastamuni (the ancient Paphlagonia), Asia Minor; twelve hundred dried plants collected in Kashmir; one hundred and thirty-nine specimens of Mexican plants; and one hundred and twenty-nine of the Greenland and Iceland flora.

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### TERPENELESS ESSENTIAL OILS.

In some notes on these oils, which have just been published in book form by Mr. Heinrich Haensel, of Pirna-on-the-Elbe, it is pointed out that essential oils, when freed from terpenes, all possess a higher boiling-point and specific gravity than in the crude state, or than the separated terpenes. In the case of oil of caraway, after the removal of the hydrocarbon carvene, it is stated that nothing remains but carvol, a compound of definite and constant composition. Lemon and orange oils, on the other hand, are said to exhibit a different behaviour, as they contain a number of terpenes, on the removal of which are left residues containing several compounds, the nature of which has not yet been scientifically determined. They are, however, easily soluble in dilute alcohol, and the solutions mix readily with water. On account of their freedom from readily oxidisable bodies also, their stability is said to be much greater than that of ordinary essential oils.

# The British Association for the Advancement of Science.

## SIXTY-SECOND ANNUAL MEETING.

The sixty-second annual meeting of the above Association commenced on Wednesday, September 13, at Nottingham, under the Presidency of J. S. Burdon-Sanderson, M.A., M.D., LL.D., D.C.L., F.R.S., F.R.S.E., Professor of Physiology in the University of Oxford.

### THE PRESIDENT'S ADDRESS.

We are assembled this evening as representatives of the sciences—men and women who seek to advance knowledge by scientific methods. The common ground on which we stand is that of belief in the paramount value of the end for which we are striving, of its inherent power to make men wiser, happier, and better; and our common purpose is to strengthen and encourage one another in our efforts for its attainment. We have come to learn what progress has been made in departments of knowledge which lie outside of our own special scientific interests and occupations, to widen our views, and to correct whatever misconceptions may have arisen from the necessity which limits each of us to his own field of study; and, above all, we are here for the purpose of bringing our divided energies into effectual and combined action.

Probably few of the members of the Association are fully aware of the influence which it has exercised during the last half-century and more in furthering the scientific development of this country. Wide as is the range of its activity, there has been no great question in the field of scientific inquiry which it has failed to discuss; no important line of investigation which it has not promoted; no great discovery which it has not welcomed. After more than sixty years of existence it still finds itself in the energy of middle life, looking back with satisfaction to what it has accomplished in its youth, and forward to an even more efficient future. One of the first of the national associations which exist in different countries for the advancement of science, its influence has been more felt than that of its successors because it is more wanted. The wealthiest country in the world, which has profited more—vastly more—by science than any other, England stands alone in the discredit of refusing the necessary expenditure for its development, and cares not that other nations should reap the harvest for which her own sons have laboured.

It is surely our duty not to rest satisfied with the reflection that England in the past has accomplished so much, but rather to unite and agitate in the confidence of eventual success. It is not the fault of governments, but of the nation, that the claims of science are not recognised. We have against us an overwhelming majority of the community, not merely of the ignorant, but of those who regard themselves as educated, who value science only in so far as it can be turned into money; for we are still in great measure—in greater measure than any other—a nation of shopkeepers. Let us who are of the minority—the remnant who believe that truth is in itself of supreme value, and the knowledge of it of supreme utility—do all that we can to bring public opinion to our side, so that the century which has given Young, Faraday, Lyell, Darwin, Maxwell, and Thomson to England, may before it closes see us prepared to take our part with other countries in combined action for the full development of natural knowledge.

Last year the necessity of an imperial observatory for physical science was, as no doubt many are aware, the subject of a discussion in Section A, which derived its interest from the number of leading physicists who took part in it, and especially from the presence and active participation of the distinguished man who is at the head of the National Physical Laboratory at Berlin. The equally pressing necessity for a central institution for chemistry, on a scale commensurate with the practical importance of that science, has been insisted upon in this Association and elsewhere by distinguished chemists. As regards biology I shall have a word to say in the same direction this evening. Of these three requirements it may be that the first is the most pressing. If so, let us all, whatever branch of science we represent, unite our efforts to realise it, in the assurance that if once the claim of science to liberal public support is admitted, the rest will follow.

In selecting a subject on which to address you this evening I have followed the example of my predecessors in limiting myself to matters more or less connected with my own scientific occupations, believing that in discussing what most interests myself I should have the best chance of interesting you. The circumstance that at the last meeting of the British Association in this town, Section D assumed for the first time the title which it has since held, that of the Section of Biology, suggested to me that I might take the word "biology" as my starting-point, giving you some account of its origin and first use, and of the relations which subsist between biology and other branches of natural science.

### ORIGIN AND MEANING OF THE TERM "BIOLOGY."

The word "biology," which is now so familiar as comprising the sum of the knowledge which has as yet been acquired concerning living nature, was unknown until after the beginning of the present century. The term was first employed by Treviranus, who proposed to himself as a life-task the development of a new science, the aim of which should be to study the forms and phenomena of life, its origin and the conditions and laws of its existence, and embodied what was known on these subjects in a book of seven volumes, which he entitled 'Biology, or the Philosophy of Living Nature." For its construction the material was very scanty, and was chiefly derived from the anatomists and physiologists. For botanists were entirely occupied in completing the work which Linnæus had begun, and the scope of zoology was in like manner limited to the description and classification of animals. It was a new thing to regard the study of living nature as a science by itself, worthy to occupy a place by the side of natural philosophy, and it was therefore necessary to vindicate its claim to such a position. Treviranus declined to found this claim on its useful applications to the arts of agriculture and medicine, considering that to regard any subject of study in relation to our bodily wants—in other words, to utility—was to narrow it, but dwelt rather on its value as a discipline and on its surpassing interest. He commends biology to his readers as a study which above all others, "nourishes and maintains the taste for simplicity and nobleness; which affords to the intellect ever new material for reflection, and to the imagination an inexhaustible source of attractive images."

Being himself a mathematician as well as a naturalist, he approaches the subject both from the side of natural philosophy and from that of natural history, and desires to found the new science on the fundamental distinction between living and non-living material. In discussing this distinction, he takes as his point of departure the constancy with which the activities which manifest themselves in the universe are balanced, emphasising the impossibility of excluding from that balance the vital activities of plants and animals. The difference between vital and physical processes he accordingly finds, not in the nature of the processes themselves, but in their co-ordination;

that is, in their adaptedness to a given purpose, and to the peculiar and special relation in which the organism stands to the external world. All of this is expressed in a proposition difficult to translate into English, in which he defines life as consisting in the reaction of the organism to external influences, and contrasts the uniformity of vital reactions with the variety of their exciting causes.*

The purpose which I have in view in taking you back as I have done to the beginning of the century, is not merely to commemorate the work done by the wonderfully acute writer to whom we owe the first scientific conception of the science of life as a whole, but to show that this conception, as expressed in the definition I have given you as its foundation, can still be accepted as true. It suggests the *idea of organism* as that to which all other biological ideas must relate. It also suggests, although perhaps it does not express it, that *action* is not an attribute of the organism but of its essence—that if, on the one hand, protoplasm is the basis of life, life is the basis of protoplasm. Their relations to each other are reciprocal. We think of the visible structure only in connection with the invisible process. The definition is also of value as indicating at once the two lines of inquiry into which the science has divided by the natural evolution of knowledge. These two lines may be easily educed from the general principle from which Treviranus started, according to which it is the fundamental characteristic of the organism that all that goes on in it is to the advantage of the whole. I need scarcely say that this fundamental conception of organism has at all times presented itself to the minds of those who have sought to understand the distinction between living and non-living. Without going back to the true father and founder of biology, Aristotle, we may recall with interest the language employed in relation to it by the physiologists of three hundred years ago. It was at that time expressed by the term *consensus partium*—which was defined as the concurrence of parts in action, of such a nature that each does *quod suum est*, all combining to bring about one effect "as if they had been in secret council," but at the same time *constanti quadam naturæ lege.*† Professor Huxley has made familiar to us how a century later Descartes imagined to himself a mechanism to carry out this *consensus*, based on such scanty knowledge as was then available of the structure of the nervous system. The discoveries of the early part of the present century relating to reflex action and the functions of sensory and motor nerves, served to realise in a wonderful way his anticipations as to the channels of influence, afferent and efferent, by which the *consensus* is maintained; and in recent times (as we hope to learn from Professor Horsley's lecture on the physiology of the nervous system) these channels have been investigated with extraordinary minuteness and success.

Whether with the old writers we speak about *consensus*, with Treviranus about *adaptation*, or are content to take *organism* as our point of departure, it means that, regarding a plant or an animal as an organism, we concern ourselves primarily with its activities or, to use the word which best expresses it, its energies. Now the first thing that strikes us in beginning to think about the activities of an organism is that they are naturally distinguishable into two kinds, according as we consider the action of the whole organism in its relation to the external world or to other organisms, or the action of the parts or organs in their relation to each other. The distinction to which we are thus led between the *internal* and *external* relations of plants and animals has, of course, always existed, but has only lately come into such prominence that it divides biologists more or less completely into two camps—on the one hand those who make it their aim to investigate the actions of the organism and its parts by the accepted methods of physics and chemistry, carrying this investigation as far as the conditions under which each process manifests itself will permit; on the other those who interest themselves rather in considering the place which each organism occupies, and the part which it plays in the economy of nature. It is apparent that the two lines of inquiry, although they equally relate to what the organism *does*, rather than to what it *is*, and therefore both have equal right to be included in the one great science of life, or biology, yet lead in directions which are scarcely even parallel. So marked, indeed, is the distinction, that Professor Haeckel some twenty years ago proposed to separate the study of organisms with reference to their place in nature under the designation of "œcology," defining it as comprising "the relations of the animal to its organic as well as to its inorganic environment, particularly its friendly or hostile relations to those animals or plants with which it comes into direct contact."* Whether this term expresses it or not, the distinction is a fundamental one. Whether with the œcologist we regard the organism in relation to the world, or with the physiologist as a wonderful complex of vital energies, the two branches have this in common, that both studies fix their attention, not on stuffed animals, butterflies in cases, or even microscopical sections of the animal or plant body—all of which relate to the framework of life—but on life itself.

The conception of biology which was developed by Treviranus as far as the knowledge of plants and animals which then existed rendered possible, seems to me still to express the scope of the science. I should have liked, had it been within my power, to present to you both aspects of the subject in equal fulness; but I feel that I shall best profit by the present opportunity if I derive my illustrations chiefly from the division of biology to which I am attached—that which concerns the *internal* relations of the organism, it being my object not to specialise in either direction, but, as Treviranus desired to do, to regard it as part—surely a very important part—of the great science of nature.

The origin of life, the first transition from non-living to living, is a riddle which lies outside of our scope. No seriously-minded person, however, doubts that organised nature as it now presents itself to us has become what it is by a process of gradual perfecting or advancement, brought about by the elimination of those organisms which failed to obey the fundamental principle of adaptation which Treviranus indicated. Each step, therefore, in this evolution is a reaction to external influences, the motive of which is essentially the same as that by which from moment to moment the organism governs itself. And the whole process is a necessary outcome of the fact that those organisms are most prosperous which look best after their own welfare. As in that part of biology which deals with the internal relations of the organism, the interest of the individual is in like manner the sole motive by which every energy is guided. We may take what Treviranus called *selfish* adaptation—*Zweckmässigkeit für sich selber*—as a connecting link between the two branches of biological study. Out of this relation springs another which I need not say was not recognised until after the Darwinian epoch—that, I mean, which subsists between the two evolutions, that of the race and that of the individual. Treviranus, no less distinctly than his great contemporary Lamarck, was well aware that the affinities of plants and animals must be estimated according to their developmental value, and consequently that classification must be founded on development; but it occurred to no one what the real link was between descent and development; nor was it, indeed, until several years after the publication of the 'Origin' that Haeckel enunciated that "biogenetic law," according to which the development of any individual organism is but a memory, a recapitulation by the individual of the development of the race—of the process for which Fritz Müller had coined the excellent word "phylogenesis;" and that each stage of the former is but a transitory reappearance of a bygone epoch in its ancestral history. If, therefore, we are right in regarding ontogenesis as dependent on phylogenesis the origin of the former must correspond with that of the latter; that is, on the power which the race or the organism at every stage of its existence possesses of profiting by every condition or circumstance for its own advancement.

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* 'Leben besteht in der Gleichförmigkeit der Reaktionen bei ungleichförmigen Einwirkungen der Aussenwelt.'—Treviranus, *Biologie oder Philosophie der lebenden Natur*, Göttingen, 1802, vol. i., p. 83.

† Bausner, *De Consensu Partium Humani Corporis*, Amst., 1556, Præf. ad lectorem, p. 4.

* These he identifies with "those complicated mutual relations which Darwin designates as conditions of the struggle for existence." Along with chorology—the distribution of animals—œcology constitutes what he calls *Relations-physiologie*. Haekel, 'Entwickelungsgang u. Aufgaben der Zoologie,' *Jenaische Zeitschr.*, vol. v. 1869, p. 353.

From the short summary of the connection between different parts of our science you will see that biology naturally falls into three divisions, and these are even more sharply distinguished by their methods than by their subjects; namely, ***Physiology***, of which the methods are entirely experimental; ***Morphology***, the science which deals with the forms and structure of plants and animals, and of which it may be said that the body is anatomy, the soul, development; and finally *Œcology*, which uses all the knowledge it can obtain from the other two, but chiefly rests on the exploration of the endless varied phenomena of animal and plant life as they manifest themselves under natural conditions. This last branch of biology—the science which concerns itself with the external relations of plants and animals to each other, and to the past and present conditions of their existence—is by far the most attractive. In it those qualities of mind which especially distinguish the naturalist find their highest exercise, and it represents more than any other branch of the subject what Treviranus termed the "philosophy of living nature." Notwithstanding the very general interest which several of its problems excite at the present moment I do not propose to discuss any of them, but rather to limit myself to the humbler task of showing that the fundamental idea which finds one form of expression in the world of living beings regarded as a whole—the prevalence of the best—manifests itself with equal distinctness, and plays an equally essential part in the internal relations of the organism in the great science which treats of them—Physiology.

### ORIGIN AND SCOPE OF MODERN PHYSIOLOGY.

Just as there was no true philosophy of living nature until Darwin, we may with almost equal truth say that physiology did not exist as a science before Johannes Müller. For although the sum of his numerous achievements in comparative anatomy and physiology, notwithstanding their extraordinary number and importance, could not be compared for merit and fruitfulness with the one discovery which furnished the key to so many riddles, he, no less than Darwin, by his influence on his successors was the beginner of a new era.

Müller taught in Berlin from 1833 to 1857. During that time a gradual change was in progress in the way in which biologists regarded the fundamental problem of life. Müller himself, in common with Treviranus and all the biological teachers of his time, was a vitalist, *i.e.*, he regarded what was then called the *vis vitalis*—the *Lebenskraft*—as something capable of being correlated with the physical forces; and as a necessary consequence held that phenomena should be classified or distinguished, according to the forces which produced them, as vital or physical, and that all those processes—that is groups or series of phenomena in living organisms—for which, in the then very imperfect knowledge which existed, no obvious physical explanation could be found, were sufficiently explained when they were stated to be dependent on so-called vital laws. But during the period of Müller's greatest activity times were changing, and he was changing with them. During his long career as professor at Berlin he became more and more objective in his tendencies, and exercised an influence in the same direction on the men of the next generation, teaching them that it was better and more useful to observe than to philosophise; so that, although he himself is truly regarded as the last of the vitalists—for he was a vitalist to the last—his successors were adherents of what has been very inadequately designated the mechanistic view of the phenomena of life. The change thus brought about just before the middle of this century was a revolution. It was not a substitution of one point of view for another, but simply a frank abandonment of theory for fact, of speculation for experiment. Physiologists ceased to theorise because they found something better to do. May I try to give you a sketch of this era of progress?

Great discoveries as to the structure of plants and animals had been made in the course of the previous decade, those especially which had resulted from the introduction of the microscope as an instrument of research. By its aid Schwann had been able to show that all organised structures are built up of those particles of living substance which we now call cells, and recognise as the seats and sources of every kind of vital activity. Hugo Mohl, working in another direction, had given the name "protoplasm" to a certain hyaline substance which forms the lining of the cells of plants, though no one as yet knew that it was the essential constituent of all living structures—the basis of life no less in animals than in plants. And, finally, a new branch of study—histology—founded on observations which the microscope had for the first time rendered possible, had come into existence. Bowman, one of the earliest and most successful cultivators of this new science, called it physiological anatomy,[*] and justified the title by the very important inferences as to the secreting function of epithelial cells and as to the nature of muscular contraction, which he deduced from his admirable anatomical researches. From structure to function, from microscopical observation to physiological experiment, the transition was natural. Anatomy was able to answer some questions, but asked many more. Fifty years ago physiologists had microscopes but had no laboratories. English physiologists—Bowman, Paget, Sharpey—were at the same time anatomists, and in Berlin Johannes Müller, along with anatomy and physiology, taught comparative anatomy and pathology. But soon that specialisation which, however much we may regret its necessity, is an essential concomitant of progress, became more and more inevitable. The structural conditions on which the processes of life depend had become, if not known, at least accessible to investigation; but very little indeed had been ascertained of the nature of the processes themselves—so little indeed that if at this moment we could blot from the records of physiology the whole of the information which had been acquired, say in 1840, the loss would be difficult to trace—not that the previously known facts were of little value, but because every fact of moment has since been subjected to experimental verification. It is for this reason that, without any hesitation, we accord to Müller and to his successors Brücke, du Bois-Reymond, Helmholtz, who were his pupils, and Ludwig, in Germany, and to Claude Bernard* in France, the title of founders of our science. For it is the work which they began at that remarkable time (1845–55), and which is now being carried on by their pupils or their pupils' pupils in England, America, France, Germany, Denmark, Sweden, Italy, and even in that youngest contributor to the advancement of science, Japan, that physiology has been gradually built up to whatever completeness it has at present attained.

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[*] The first part of the *Physiological Anatomy* appeared in 1843. It was concluded in 1856.

What were the conditions which brought about this great advance which coincided with the middle of the century? There is but little difficulty in answering the question. I have already said that the change was not one of doctrine, but of method. There was, however, a leading idea in the minds of those who were chiefly concerned in bringing it about. That leading notion was, that however complicated may be the conditions under which vital energies manifest themselves, they can be split into processes which are identical in nature with those of the non-living world, and, as a corollary to this, that the analysing of a vital process into its physical and chemical constituents, so as to bring these constituents into measurable relation with physical or chemical standards, is the only mode of investigating them which can lead to satisfactory results.

There were several circumstances which at that time tended to make the younger physiologists (and all of the men to whom I have just referred were then young) sanguine, perhaps too sanguine, in the hope that the application of experimental methods derived from the exact sciences would afford solutions of many physiological problems. One of these was the progress which had been made in the science of chemistry, and particularly the discovery that many of the compounds which before had been regarded as special products of vital processes could be produced in the laboratory, and the more complete knowledge which had been thereby acquired of their chemical constitutions and relations. In like manner, the new school profited by the advances which had been made in physics, partly by borrowing from the physical laboratory various improved methods of observing the phenomena of living beings, but chiefly in consequence of the direct bearing of the crowning discovery of that epoch (that of the conservation of energy) on the discussions which then took place as to the relations between vital and physical forces; in connection with which it may be noted that two of those who (along with Mr. Joule and your President at the last Nottingham meeting) took a prominent part in that discovery—Helmholtz and J. R. Mayer—were physiologists as much as they were physicists. I will not attempt even to enumerate the achievements of that epoch of progress. I may, however, without risk of wearying you, indicate the lines along which research at first proceeded, and draw your attention to the contrast between then and now. At present a young observer who is zealous to engage in research finds himself provided with the most elaborate means of investigation, the chief obstacle to his success being that the problems which have been left over by his predecessors are of extreme difficulty, all of the easier questions having been worked out. There were then also difficulties, but of an entirely different kind. The work to be done was in itself easier, but the means for doing it were wanting, and every investigator had to depend on his own resources. Consequently the successful men were those who, in addition to scientific training, possessed the ingenuity to devise and the skill to carry out methods for themselves. The work by which du Bois-Reymond laid the foundation of animal electricity would not have been possible had not its author, besides being a trained physicist, known how to do as good work in a small room in the upper floor of the old University Building at Berlin as any which is now done in his splendid laboratory. Had Ludwig not possessed mechanical aptitude, in addition to scientific knowledge, he would have been unable to devise the apparatus by which he measured and recorded the variations of arterial pressure (1848), and verified the principles which Young had laid down thirty years before as to the mechanics of the circulation. Nor, lastly, could Helmholtz, had he not been a great deal more than a mere physiologist, have made those measurements of the time-relations of muscular and nervous responses to stimulation, which not only afford a solid foundation for all that has been done since in the same direction, but have served as models of physiological experiment, and as evidence that perfect work was possible and was done by capable men, even when there were no physiological laboratories.

Each of these examples relates to work done within a year or two of the middle of the century.* If it were possible to enter more fully on the scientific history of the time, we should, I think, find the clearest evidence, first, that the foundation was laid in anatomical discoveries, in which it is gratifying to remember that English anatomists (Allen Thomson, Bowman, Goodsir, Sharpey) took considerable share; secondly, that progress was rendered possible by the rapid advances which, during the previous decade, had been made in physics and chemistry, and the participation of physiology in the general awakening of the scientific spirit which these discoveries produced. I venture, however, to think that, notwithstanding the operation of these two causes, or rather combinations of causes, the development of our science would have been delayed had it not been for the exceptional endowments of the four or five young experimenters whose names I have mentioned, each of whom was capable of becoming a master in his own branch, and of guiding the future progress of inquiry.

Just as the affinities of an organism can be best learned from its development, so the scope of a science may be most easily judged of by the tendencies which it exhibits in its origin. I wish now to complete the sketch I have endeavoured to give of the way in which physiology entered on the career it has since followed for the last half century, by a few words as to the influence exercised on general physiological theory by the progress of research. We have seen that no real advance was made until it became possible to investigate the phenomena of life by methods which approached more or less closely to those of the physicist, in exactitude. The methods of investigation being physical or chemical, the organism itself naturally came to be considered as a complex of such processes, and nothing more. And in particular the idea of adaptation, which, as I have endeavoured to show, is not a consequence of organism, but its essence, was in great measure lost sight of. Not, I think, because it was any more possible than before to conceive of the organism otherwise than as a working together of parts for the good of the whole, but rather that, if I may so express it, the minds of men were so occupied with new facts that they had not time to elaborate theories. The old meaning of the term "adaptation" as the equivalent of "design" had been abandoned, and no new meaning had yet been given to it, and consequently the word "mechanism" came to be employed as the equivalent of "process," as if the constant concomitance or sequence of two events was in itself a sufficient reason for assuming a mechanical relation between them. As in daily life so also in science, the misuse of words leads to misconceptions. To assert that the link between *a* and *b* is mechanical, for no better reason than that *b* always follows *a*, is an error of statement, which is apt to lead the incautious reader or hearer to imagine that the relation between *a* and *b* is understood, when in fact its nature may be wholly unknown. Whether or not at the time which we are considering, some physiological writers showed a tendency to commit this error, I do not think that it found expression in any generally accepted theory of life. It may, however, be admitted that the rapid progress of experimental investigation led to too confident anticipations, and that to some enthusiastic minds it appeared as if we were approaching within measurable distance of the end of knowledge. Such a tendency is, I think, a natural result of every signal advance. In an eloquent Harveian oration, delivered last autumn by Dr. Bridges, it was indicated how, after Harvey's great discovery of the circulation, men were too apt to found upon it explanations of all phenomena whether of health or disease, to such an extent that the practice of medicine was even prejudicially affected by it. In respect of its scientific importance, the epoch we are considering may well be compared with that of Harvey, and may have been followed by an undue preference of the new as compared with the old, but no more permanent unfavourable results have shown themselves. As regards the science of medicine, we need only remember that it was during the years between 1845 and 1860 that Virchow made those researches by which he brought the processes of disease into immediate relation with the normal processes of cell-development and growth, and so, by making pathology a part of physiology, secured its subsequent progress and its influence on practical medicine. Similarly in physiology, the achievements of those years led on without any interruption or drawback to those of the following generation; while in general biology, the revolution in the mode of regarding the internal processes of the animal or plant organism which resulted from these achievements, prepared the way for the acceptance of the still greater revolution which the Darwinian epoch brought about in the views entertained by naturalists of the relations of plants and animals to each other and to their surroundings.

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* It is worthy of note that these five distinguished men were nearly contemporaries: Ludwig graduated in 1839, Bernard in 1843, the other three between those dates. Three survive—Helmholtz, Ludwig, du Bois-Reymond.

* The *Untersuchungen über thierische Electricität* appeared in 1848; Ludwig's researches on the circulation, which included the first description of the "kymograph" and served as the foundation of the "graphic method" in 1847; Helmholtz's research on the propagation in motor nerves in 1851.

It has been said that every science of observation begins by going out botanising, by which, I suppose, is meant that collecting and recording observations is the first thing to be done in entering on a new field of inquiry. The remark would scarcely be true of physiology, even at the earliest stage of its development, for the most elementary of its facts could scarcely be picked up as one gathers flowers in a wood. Each of the processes which go to make up the complex of life requires separate investigation, and in each case the investigation must consist in first splitting up the process into its constituent phenomena, and then determining their relation to each other, to the process of which they form part, and to the conditions under which they manifest themselves. It will, I think, be found that even in the simplest inquiry into the nature of vital processes some such order as this is followed. Thus, for example, if muscular contraction be the subject on which we seek information, it is obvious that, in order to measure its duration, the mechanical work it accomplishes, the heat wasted in doing it, the electro-motive forces which it develops, and the changes of form associated with these phenomena, special modes of observation must be used for each of them, that each measurement must be in the first instance separately made, under special conditions, and by methods specially adapted to the required purpose. In the synthetic part of the inquiry the guidance of experiment must again be sought for the purpose of discriminating between apparent and real causes, and of determining the order in which the phenomena occur. Even the simplest experimental investigations of vital processes are beset with difficulties. For, in addition to the extreme complexity of the phenomena to be examined, and the uncertainties which arise from the relative inconstancy of the conditions of all that goes on in the living organism, there is this additional drawback, that, whereas in the exact sciences experiment is guided by well-ascertained laws, here the only principle of universal application is that of adaptation, and that even this cannot, like a law of physics, be taken as a basis for deductions, but only as a summary expression of that relation between external exciting causes, and the reactions to which they give rise, which, in accordance with Treviranus' definition, is the essential character of vital activity.

(*To be continued.*)

# Proceedings of Societies in London.

## CHEMICAL SOCIETY.

### THE CONSTITUENTS OF THE INDIAN DYE STUFF KAMALA.*

BY A. G. PERKIN, F.R.S.E.

(*Concluded from page* 160.)

*Action of Acetic Anhydride on Rottlerin.*

Boiling acetic anhydride dissolves rottlerin somewhat sparingly, and if the solution be at once rapidly cooled, it crystallises out unchanged. If, on the other hand, the solution be allowed to cool gradually, nothing separates, the rottlerin being converted into a more soluble compound.

A solution of rottlerin in acetic anhydride, having been boiled for a few minutes, was evaporated in the oil-bath to a small bulk, and poured into water. The yellowish, resinous precipitate produced was collected, washed with water, and purified by two or three crystallisations from methyl alcohol.

The following analyses were made with two distinct preparations of this substance:—

0·1778 gave 0·4265 $CO_2$ and 0·0854 $H_2O$. C = 65·42; H = 5·33.

0·1582 gave 0·3785 $CO_2$ and 0·0757 $H_2O$. C = 65·25; H = 5·32.

$C_{15}H_{14}O_5$ or $C_{11}H_8O_3(C_2H_3O)_2$ requires C = 65·69; H = 5·11 per cent.

As thus obtained, this compound, probably acetylrottlerin, is a yellowish, crystalline powder, which softens at 100°, and melts at 130–135°. It is easily soluble in hot methyl alcohol and in ether, but is not dissolved by cold alkaline solutions. On boiling with alcoholic potash, it is decomposed, yielding an orange-red solution, from which, after dilution with water, acids throw down a salmon-coloured precipitate.

*Decomposition of Rottlerin with Fused Alkalis.*

To 50 grammes of potash melted with a little water and heated to 150°, 5 grammes of finely powdered rottlerin were gradually added. The brown solution which was at first formed soon began to froth, but on continued heating the froth gradually subsided, and the liquid became lighter in colour. At the end of half an hour, the mass was poured into water, the solution filtered from some resinous matter, and the filtrate acidified and extracted with ether. On evaporating the ethereal extract, a light brownish, viscid residue was obtained, having a distinct odour of acetic acid; this after some hours gradually became crystalline. It was then treated with a little boiling water, filtered, and the almost colourless, crystalline substance which separated on cooling further purified by two recrystallisations from water, using animal charcoal.

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* From the *Journal of the Chemical Society.*

The colourless, glistening needles thus obtained melted at 121°, sublimed unchanged at higher temperatures, and had all the properties of benzoic acid. As the quantity obtained was very small, it was converted into its silver salt, and analysed with the following result:—

0·0745 gave 0·0990 $CO_2$, 0·0167 $H_2O$, and 0·0354 Ag. C=36·24; H=2·49; Ag=47·51.

$C_6H_5{\cdot}COOAg$ requires C=36·68; H=2·18; Ag=47·16 per cent.

It was therefore silver benzoate.

In order to ascertain whether acetic acid was formed in this decomposition, the aqueous mother liquors were distilled with steam, the distillate neutralised with barium carbonate, filtered and evaporated to a small bulk. Silver nitrate added to this solution precipitated the silver salt, which was collected, washed with water, dried over sulphuric acid, and analysed with the following result:—

0·3593 on ignition gave 0·2328 Ag. Ag=64·79.

$CH_3{\cdot}COOAg$ requires Ag=64·66 per cent.

This substance was therefore silver acetate.

### *Oxidation of Rottlerin by Hydrogen Peroxide.*

Five grammes of rottlerin were dissolved in a litre of very dilute caustic soda, and 200 Cc. of commercial hydrogen peroxide added in small quantities at a time; this caused the orange coloured liquid gradually to become darker, until finally it acquired a blackish-brown tint; at the same time an odour of benzaldehyde was noticeable. The liquid was then gently heated, until it became pale yellow, when it was neutralised with acid, and extracted two or three times with ether. The ethereal extract, on evaporation, left a pale brown, gummy residue, having a strong odour of acetic acid and benzaldehyde, which, after standing during several hours, became partly crystalline. In order to separate the various constituents of this product, it was distilled with steam, the distillate extracted with ether, and the colourless, crystalline residue left on evaporating the ether purified from a small quantity of oily matter by crystallisation first from light petroleum and finally from water. It was thus obtained in glistening needles, melted at 121°, sublimed unchanged at higher temperatures, and had all the properties of benzoic acid. Sufficient was not obtained for analysis, as the principal product consisted of a brown, resinous, uncrystallisable substance, which was evidently similar in nature to the resin obtained during the fusion of rottlerin with caustic alkali. As stated in the introduction, the strong odour of benzaldehyde produced during the oxidation of rottlerin leaves little doubt that it is one of the first products of the action, being subsequently transformed into benzoic acid.

The aqueous liquors obtained during the purification of the benzoic acid contained large quantities of acetic acid, and as its presence seemed to admit of so little doubt, no attempts were made to obtain it in a condition suitable for analysis.

### *The Action of Nitric Acid on Rottlerin.*

When rottlerin is added to fuming nitric acid of sp. gr. 1·5, an energetic action takes place, and a brown solution is formed, which, on treatment with water, deposits a yellowish, resinous mass. Nitric acid (sp. gr. 1·42) alone, or diluted with water or acetic acid, acts less violently, but in a similar manner. From this product no definite substance could be isolated by crystallisation, but when extracted with ether, the ethereal solution evaporated, and the residue distilled with steam, a small quantity of a colourless, crystalline substance, apparently benzoic acid, was isolated. The quantity produced, however, was far too small to admit of its proper identification.

When rottlerin is acted on by warm fuming nitric acid of sp. gr. 1·5, torrents of red fumes are evolved, and if the greater part of the nitric acid is rapidly distilled off, the residue, on cooling, sets to a semi-solid, crystalline mass. This was drained on a porous plate and recrystallised from nitric acid of sp. gr. 1·42, to remove a small quantity of resinous matter adhering to it, collected, washed with water, and finally purified by crystallisation from benzene. It was found to be free from nitrogen.

Analysis gave the following result:—

0·1003 gave 0·1845 $CO_2$ and 0·0318 $H_2O$. C=50·16; H=3·52.

$C_{13}H_{10}O_9$ requires C=50·32; H=3·20 per cent.

This new substance crystallises from benzene in beautiful, thin, glittering plates, melting at 232°, and subliming at higher temperatures without undergoing decomposition. It is a strong acid, dissolving in solutions of sodium or potassium carbonates, and forming crystalline salts. From the ammonium salt, which crystallises in colourless plates, the silver salt is readily obtained, by the addition of silver nitrate, as a curdy, white precipitate, which under the microscope is seen to consist of minute, transparent needles; on ignition, it is decomposed without the production of a crystalline sublimate.

On analysis the following numbers were obtained:—

0·1869 gave 0·2066 $CO_2$, 0·0294 $H_2O$, and 0·0767 Ag. C=30·14; H=1·74; Ag=41·04.

$C_{13}H_8O_9.Ag_2$ requires C=29·77; H=1·52; Ag=41·22 per cent.

The acid is therefore bibasic. It is sparingly soluble in benzene, moderately soluble in ordinary nitric acid and acetic acid, and readily soluble in alcohol. The yield obtained is very small.

Considerable quantities of oxalic acid are also formed.

### *Action of Cold Concentrated Nitric Acid on Rottlerin.*

Finely powdered rottlerin was added in small quantities at a time to cold nitric acid of sp. gr. 1·5, care being taken to avoid any rise of temperature. After some quantity had been added, minute crystals commenced to appear in the solution, and these rapidly increased in amount until the liquid had assumed a pasty consistency. The crystalline product was then collected upon a glass wool filter, the operation being performed as quickly as possible, as if the excess of nitric acid be not at once removed, the mixture gets hot, nitrous fumes are evolved, and the yield of substance is greatly diminished. The nitric acid mother liquors were surrounded with cold water, placed under a bell jar, and the crystalline matter which gradually separated collected in a similar manner. After draining on a porous plate, the nearly colourless, crystalline mass was washed with a little ether and crystallised two or three times from alcohol with the aid of animal charcoal.

The alcoholic mother liquors from the purification of this substance were set aside for further examination.

On analysis the following numbers were obtained:—

0·1233 gave 0·2557 $CO_2$ and 0·0445 $H_2O$. C = 56·55; H = 4·01.

0·1021 gave 0·2119 $CO_2$ and 0·0387 $H_2O$. C = 56·60; H = 4·23.

$C_{17}H_{14}O_9$ requires C = 56·8; H = 3·8 per cent.

By crystallisation from alcohol, it was obtained in colourless needles melting at 282° and subliming at slightly higher temperatures, but undergoing partial decomposition. The sublimed substance also melted at 282°. It is almost insoluble in benzene, sparingly soluble in methyl alcohol and ether, more readily in alcohol and acetic acid; the analysis of the silver salt given below shows the acid to be bibasic; it dissolves in solutions of sodium and potassium carbonates yielding colourless salts. From the ammonium salt, which crystallises in colourless plates, the silver salt was obtained as a curdy, white precipitate, on adding silver nitrate.

0·2117 gave 0·2275 $CO_2$, 0·0402 $H_2O$, and 0·0773 Ag. C = 35·69; H = 2·11; Ag = 36·51.

$C_{17}H_{12}O_9Ag_2$ requires C = 35·41; H = 2·08; Ag = 37·50 per cent.

When strongly heated, this silver salt is decomposed with some violence, a portion of the acid subliming, which accounts for the somewhat low percentage of silver obtained. On dissolving it in nitric acid of sp. gr. 1·5, and rapidly evaporating the solution to a small bulk, a crystalline product was obtained which, after recrystallisation from nitric acid of sp. gr. 1·42, formed a glistening mass of thin plates melting at 232°, and subliming without undergoing decomposition. It was evidently identical with the acid of the formula $C_{13}H_{10}O_9$, obtained by the action of boiling nitric acid on rottlerin.

The alcoholic mother liquors obtained in the purification of the acid $C_{17}H_{14}O_9$, when mixed with much hot water and then cooled, deposited a small quantity of crystals, which by fractional crystallisation from alcohol were easily separated into two substances, namely, the acid $C_{17}H_{14}O_9$, melting at 282°, described above, and a new acid very soluble in alcohol. The latter was further purified by crystallisation from methyl alcohol and analysed with the following result:—

0·0885 gave 0·1818 $CO_2$ and 0·0326 $H_2O$. C = 56·02; H = 4·09.

$C_{17}H_{16}O_9$ requires C = 56·04; H = 4·39 per cent.

Various small preparations of this acid all melted at 226°, subliming at higher temperatures, undergoing partial carbonisation, but much less readily than the acid of the formula $C_{17}H_{14}O_9$. It crystallises from methyl alcohol in groups of small, colourless needles very soluble in acetic acid, moderately so in ether. Solutions of alkali carbonates dissolve it, forming colourless solutions of the corresponding salts, but the quantity obtained was too small to allow of a determination of its basicity. Boiling nitric acid of sp. gr. 1·5 converts it into the acid of the formula $C_{13}H_{10}O_9$, obtained by the action of boiling nitric acid on rottlerin. As the acid of the formula $C_{17}H_{16}O_9$ differs from that of the formula $C_{17}H_{14}O_9$ by 2H, it is evidently an earlier product of the oxidation of rottlerin, and should be converted into the latter by further treatment with cold nitric acid. It is proposed to determine by experiment whether this is the case.

### *The Resin of Low Melting Point.*

The resin of low melting point consisted of a brittle, transparent, dark-red mass melting below 100°, which resisted all attempts to obtain it in a crystalline condition. In its crude state it contained traces of wax and essential oil, the removal of which was found to be best effected in the following manner.

The powdered mass was dissolved in very dilute solution of caustic soda, the dark orange-coloured solution freed from wax and oil by repeated extraction with ether, and then treated with baryta water. After removal of a slight reddish precipitate so formed, hydrochloric acid threw down from the solution yellow flocks of the resin, which were taken up by ether; the ethereal solution was then evaporated, and the residue dried at 110° till constant. Analyses of different preparations gave the following results:—

0·1320 gave 0·3427 $CO_2$ and 0·0748 $H_2O$. C = 70·80; H = 6·29.

0·1227 gave 0·3191 $CO_2$ ($H_2O$ lost). C = 70·92.

$C_{12}H_{11}O_3$ requires C = 70·59; H = 5·88 per cent.

An examination of the above figures shows that the formula of this substance differs from that of rottlerin by $CH_2$, and though investigation proved the absence of a methoxy-group, it is still possible that it may represent a methylrottlerin.

It is very soluble in carbon bisulphide, ether, and chloroform, and moderately so in glacial acetic acid and benzene, but only sparingly in methyl alcohol, from a hot solution of which it is deposited in resinous globules. Cold concentrated sulphuric acid dissolves it, forming an orange-coloured solution from which water precipitates orange flocks of a new substance melting considerably above 100°. The behaviour of this resin when treated with solutions of the alkalis is similar to that of rottlerin, the odour of benzaldehyde being also apparent in this case. The alkaline or acid solutions of the resin are readily reduced by zinc dust, yielding a colourless compound. When it is treated with hydrogen peroxide in alkaline solution, phenomena are observed similar to those obtained with rottlerin, a small quantity of an acid similar to benzoic acid being produced, but not in quantity sufficient for identification. When acted on by cold nitric acid of sp. gr. 1·5, no crystalline product was obtained, but it was violently attacked by the boiling acid, and after evaporating the solution to a small bulk it solidified on cooling to a crystalline mass. This, after draining on a porous plate, was purified by crystallisation from ordinary nitric acid and from benzene, and analysed with the following result:—

0·1083 gave 0·1992 $CO_2$ and 0·0345 $H_2O$. C = 50·16; H = 3·53.

$C_{13}H_{10}O_9$ requires C = 50·32; H = 3·20 per cent.

The acid was thus obtained as a colourless glistening mass of thin plates, melting at 232°, subliming without undergoing decomposition, and having all the properties of the acid $C_{13}H_{20}O_5$, obtained in a similar manner from rottlerin. The acid mother liquors from the preparation of this substance were found to contain oxalic acid.

### *The Yellow Crystalline Colouring Matter.*

As previously mentioned, this substance is found to a very small extent in that portion of rottlerin which is extracted from kamala by means of cold carbon bisulphide, and from which it is readily separated by means of its comparative insolubility in benzene or toluene. It was at first thought that it might be some extraneous impurity added to it accidentally during the transport or storing, but, after careful examination, it has been found in three samples of the drug obtained from different sources, and is most probably contained in the minute, hair-like fibres which are easily observed in kamala. As there is so little of this substance it dissolves completely during the first carbon bisulphide extraction, notwithstanding its comparative insolubility, and no traces of it were ever obtained from the later extractions.

The amount present in kamala is so minute that from 1 kilogramme of this dye stuff scarcely 0·1 gramme was obtained, and as yet the quantity collected is insufficient for analysis.

It was purified by crystallisation from toluene, with the aid of animal charcoal, and was deposited from the hot solution on cooling as a beautiful glistening mass of pale-yellow needles melting at 192–193°. At higher temperatures it is carbonised, giving off a white vapour having a peculiar irritating odour similar to that which is so characteristic of rottlerin. In its behaviour with caustic alkalies, sulphuric acid, and also under the influence of reducing agents, it shows a behaviour similar to that of rottlerin, proving without doubt that these two substances are very closely allied. It differs, however, from rottlerin in its behaviour with solvents, being much less soluble in toluene, chloroform. and acetic acid. When boiled with cumene it is decomposed; solvents of very high boiling point cannot, therefore, be used in its purification.

Experiments are now being carried on with larger quantities of kamala, and it is hoped that by this means sufficient of this yellow substance will be obtained for analysis.

### *The Wax.*

This, in its crude condition, consisted of a reddish, somewhat brittle mass, coloured by traces of the resin of low melting point. It was best purified by extraction, first with small quantities of methyl alcohol, which removed the colouring matter, and crystallisation of the residue several times from acetic acid, and finally from light petroleum. Analyses of different preparations gave the following numbers :—

0·1225 gave 0·3592 $CO_2$ and 0·1405 $H_2O$. C = 79·96; H = 12·74.

0·0990 gave 0·2895 $CO_2$ and 0·1164 $H_2O$. C = 79·74; H = 13·04.

$C_{28}H_{54}O_2$ requires C = 79·62; H = 12·79 per cent.

In a third preparation, the use of acetic acid was avoided, the substance being crystallised several times from methyl alcohol.

0·1075 gave 0·3129 $CO_2$ and 0·1236 $H_2O$. C = 79·38; H = 12·76.

$C_{28}H_{54}O_2$ requires C = 79 62; H = 12 79 per cent.

This wax is a colourless, somewhat brittle mass, melting at 82° to a slightly brownish liquid, which, when strongly heated, evolves the characteristic smell of heated wax. From hot solutions of most solvents it is deposited on cooling as a gelatinous mass, which, on drying gradually, shrivels up to minute specks. From ether and light petroleum, however, it can be obtained in an indistinct crystalline form, and hot glacial acetic acid deposits it, on cooling, in microscopic, waxy plates.

The composition of this substance does not accord with that of any wax at present known, but the small quantity of pure product obtainable has not allowed of any extended investigation of its properties. It may, perhaps, consist of a slightly impure cetyl cerotinate, $C_{54}H_{108}O_2$, which melts at 82°, and requires carbon 82·23 per cent. and hydrogen 13·70 per cent. Fractional crystallisation of this kamala wax from alcohol or acetic acid did not appear to cause a separation into different products, as in all cases the various fractions melted at 82°, and, therefore, if this substance be a mixture, other methods of separation must be resorted to.

### *The Ethereal Extract of Kamala. Isorottlerin.*

The residue of kamala, which had been thoroughly extracted with carbon bisulphide, was digested with ether repeatedly, and the combined extracts evaporated to a small bulk. About six times its volume of chloroform was now added, causing the formation of a small quantity of a yellow, resinous precipitate, which was collected, the filtrate distilled down to one-third its bulk, and set aside to cool. It gradually deposited a reddish, sandy, crystalline precipitate, which was collected and washed with chloroform until the washings became colourless. The mother liquors were preserved for further examination.

For purification, the product was redissolved in ether, chloroform added, and the liquid slowly distilled down. As the evaporation proceeded, minute crystals gradually separated, and these were collected and washed with chloroform, and the operation repeated.

Isorottlerin was thus obtained as a salmon-coloured, glistening mass of crystals, which became highly electrical when powdered, and resembled rottlerin very closely in appearance. So much was this the case, that in the earlier experiments it was believed to consist of impure rottlerin and placed aside, the resin of high melting point which accompanies it being at the time only examined, but it was ultimately found that this substance was distinct from rottlerin.

Analysis gave the following numbers :—

0·1380 gave 0·3082 $CO_2$ and 0·0596 $H_2O$. C = 60·90; H = 4·79.

0·1303 gave 0·2915 $CO_2$ ($H_2O$ lost). C = 61·02.

$C_{12}H_{12}O_5$ requires C = 61·00; H = 5·08 per cent.

From a mixture of ether and chloroform, which is the best medium from which to crystallise it, it is deposited as transparent, rounded plates, melting at 198–199° and decomposing at higher temperatures, an acrid vapour being evolved. It is practically insoluble in hot benzene, carbon bisulphide, and chloroform, sparingly soluble in ether and cumene. Cold solutions of the alkali hydrates and boiling solutions of the alkali carbonates dissolve it readily, forming orange-red liquids much darker in colour than the corresponding solutions from rottlerin, from which they are also readily distinguished by the non-separation of resinous matter, even on long boiling, and the entire absence of the odour of benzaldehyde, which is always produced when alkaline solutions of rottlerin are treated in a similar manner. The addition of acid to the alkaline solution causes the precipitation of brownish-red flocks, which do not congeal to a sticky mass, as in the case of rottlerin, and apparently consists of the unchanged substance. Isorottlerin is readily reduced by zinc dust in acetic acid solution to a colourless compound, but the same change is not produced by alkaline reducing agents, the orange-red solution becoming only faintly lighter in colour. Ferric chloride gives a brownish-black coloration with isorottlerin in alcoholic solution. Cold nitric acid of sp. gr. 1·5 readily attacks it, and the brown orange-coloured solution so formed, on treatment with water, deposits a pale yellow precipitate. A solution in boiling nitric acid, when rapidly evaporated, left a crystalline residue, from which, after purification, a colourless mass of thin plates was obtained which melted at 232°, and were evidently identical with the acid of the formula $C_{13}H_{10}O_9$, obtained in a similar manner from rottlerin. Attempts to prepare the acids $C_{17}H_{14}O_9$ and $C_{17}H_{16}O_9$ by means of cold nitric acid were unsuccessful, but as these experiments could only be carried out with small quantities of material, no great importance can be attached to the want of success.

### *The Resin of High Melting Point.*

The mother liquors from the preparation of isorottlerin contained, besides traces of this substance, a large amount of resinous product very soluble in ether, but almost insoluble in carbon bisulphide. In order to isolate this resin, the residue after the evaporation of the chloroform was powdered and extracted with boiling benzene. These extracts, on cooling, deposited a gelatinous, sticky product, consisting of the resinous matter mixed with traces of isorottlerin, which was placed on one side for further treatment.

The addition of light petroleum to the filtrate threw down a pale yellow, amorphous precipitate, which was collected, well washed with light petroleum, dried, extracted with benzene, and again treated as before.

Analyses of distinct preparations gave the following numbers:—

0·1288 gave 0·3180 $CO_2$ and 0·0628 $H_2O$. C = 67·33; H = 5·41.

0·1173 gave 0·2894 $CO_2$ and 0·0577 $H_2O$. C = 67·28; H = 5·46.

$C_{13}H_{12}O_4$ requires C = 67·24; H = 5·17 per cent.

This resin is a pale straw coloured amorphous mass, very soluble in alcohol and acetic acid, moderately so in benzene and toluene. When heated in a capillary tube it commences to darken at 120°, and congeals to dark resinous globules at about 150°. Caustic and carbonated alkalis act on it much as they do on rottlerin, forming deep orange-coloured solutions, which are decomposed on boiling, evolving an odour of benzaldehyde, and are decolorised by zinc-dust. If it is dissolved in boiling nitric acid of sp. gr. 1·5 and the solution is evaporated, the residue yields crystals melting at 232°, and identical with the acid $C_{13}H_{10}O_9$.

### *The Sugar.*

As stated in the introduction, kamala evidently contains a small quantity of a sugar, perhaps originally existing in combination as a glucoside. Owing, however, to the presence in the drug of both mineral and organic substances readily soluble in boiling water, it has not been found possible up to the present to devise a satisfactory method for its purification.

On boiling kamala with water, a somewhat dark-coloured extract is obtained, which can be clarified to some extent by treatment with sulphuric acid, neutralisation with carbonate of lead, filtration, and removal of any lead from the filtrate by means of hydrogen sulphide. By carefully evaporating the liquid, a very hygroscopic, light brown, viscid mass is obtained, having a faint, treacle-like taste, a solution of which readily reduces Fehling's solution.

The experiments on this sugar are about to be repeated, starting, if possible, from an unadulterated sample of kamala.

An extended series of dyeing experiments with kamala, and also a comparison of the dyeing properties of the various colouring matters obtained from it and described here, are now being carried out in the dyeing department of the Yorkshire College.

It is my intention to continue the study of kamala, and to carefully investigate the various new products described in this paper. I am also commencing an investigation on the purplish drug called "waras" or "wurus," the fruit glands of *Flemingia gralannaria* (Zcongesta Zrhodocarpe), which I believe to contain products closely allied to rottlerin.

## Obituary.

Notice has been received of the death of the following:—

On the 27th of August, Thomas Perkins, Chemist and Druggist, Moreton-in-Marsh. (Aged 69).

On the 30th of August, William Pirie, Pharmaceutical Chemist, late of Edinburgh.

On the 9th of September, George Allen, Pharmaceutical Chemist, Ampthill. (Aged 80).

On the 9th of September, James Savage, Chemist and Druggist, late of Bradford. (Aged 44).

On the 9th of September, Benjamin Scott, Chemist and Druggist, N. Walsham. (Aged 66).

On the 12th of September, William Charrington, Chemist and Druggist, Lichfield. (Aged 62).

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Baxter, Clark, Currie, Cross, Dawson, Elborne, Hill, Kirkby, Laing, Morrison, Naylor, Parkinson, Pereira, Reynolds, Schacht, Thompson, Turner, Williams.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### "THE MONTH."

Sir,—In your article, "The Month" (September 3), there are several notes of special interest. (1) Dr. Squibb confirms the observation made by previous experimenters, that metallic sodium is not by any means the best agent for removing the last traces of water from an alcohol. The same probably holds good with ether, although the suggestion was called in question at the Newcastle meeting of the Conference. I agree with Dr. Squibb, that no one has ever yet prepared absolutely anhydrous alcohol, and it is just as unlikely that anyone has succeeded in obtaining absolute ether, *i.e.*, ether perfectly free from the last traces of alcohol and water. These facts have to be borne in mind when treating of solubilities. (2) The observation of Burls that hydrocyanic acid is formed by the action of nitric acid on sugar recalls to mind that a similar formation occurs in preparing amylic nitrite by the action of nitric acid on amyl alcohol. In this case oxalic acid is likewise formed. Whether the proportion of prussic acid formed is in any degree dangerous does not seem to have been determined. (3) It does not appear from the abstract that the cathartic acid of Gensz differs from that isolated and described (*Pharm. Journ.*, [3], xv., 749) by Dr. Stockman, while working in the laboratory of Professor Schmiedeberg. Both products are described as amorphous, slightly coloured bodies, acid in reaction, and powerfully purgative.

*Edinburgh.* D. B. DOTT.

### DISPENSING DIFFICULTY.

Sir,—The following prescription was presented to me for dispensing:—℞. chloridi antimon. ℥ij (in wide-necked bottle). For outward application as directed. I supplied antim. terchlor. in powder. The medical man who wrote the prescription, on seeing what I had supplied, told his patient that it had been wrongly dispensed. On seeing me, however, he said that he intended liq. antim. chlor., B.P., to be sent, and abused me for not doing so, which is, I consider, rather hard lines. I should feel greatly indebted to you if you would, through the medium of the correspondence column of the Journal, advise me whether I have a right to demand the doctor to act fairly, and explain the affair properly to his patient, as such a thing naturally, when communicated to the public, tends to injure one's character. J. T. W.

### A QUERY.

Sir,—In the *Pharmaceutical Journal*, vol. vii., 1847–8, page 182, there is an account of Rev. J. B. Reade's method of preparing pure potassium iodide and pure soluble Prussian blue of a very superior quality and rich blue colour. The processes he patented. Can you kindly favour me with the address of any manufacturing chemist who makes the pot. iod. and blue by "Reade's" process? Has the patent expired?

*South Hampstead.* J. S. T. W. SMITH.

## BOOKS, ETC., RECEIVED.

ST. THOMAS'S HOSPITAL REPORTS. Vol. xxi. Edited by Dr. T. D. ACLAND and Mr. BERNARD PITTS. Pp. i-xi, 1 to 531. London: J. and A. Churchill. 8s. 6d. From the Hospital.

ABSTRACT OF SANITARY REPORTS, Vol. viii., No. 34. Treasury Department, U.S. Marine Hospital Service. Washington, D.C. From the Surgeon-General.

THE CLINICAL USE OF PRISMS, AND THE DECENTERING OF LENSES. By ERNEST E. MADDOX, M.D. Second Edition. Bristol: John Wright and Co. Pp. i.-xi., 1 to 170. 4s. 6d. From the Publishers.

SCIATIC NEURITIS, ITS PATHOLOGY AND TREATMENT. By ROBERT SIMPSON, L.R.C.P., L.R.C.S. Bristol: John Wright and Co. Pp. 1—46. 1s. From the Publishers.

# PHARMACOPŒIA OF THE UNITED STATES OF AMERICA.

## SEVENTH DECENNIAL REVISION, 1890.

(*Continued from page* 225.)

With very few exceptions increased precision in defining the characters of chemical products has been substituted in the new Pharmacopœia for directions as to their preparation. The industrial specialisation of the manufacture of chemical products of all kinds has now established in that respect a further division of labour which does away with any necessity for the pharmacist to prepare morphine, quinine, or other alkaloids, potassium iodide or chlorate, phosphoric or hydrochloric acids, etc., or even to undertake the purification of such articles. This altered condition has been recognised by the Committee of revision, and at the same time attention has been directed to the complementary requirement of providing tests for the identification of chemical products and for ascertaining their freedom from objectionable impurity. In this respect the new Pharmacopœia is generally very much in advance of the present B.P. It would be inappropriate to institute a more detailed comparison on account of the revision of the one being so much more recent than that of the other, but it may be added that in the new Pharmacopœia the directions for the testing of chemical products are sufficiently complete to enable a pharmacist to give as full a personal guarantee of their nature and quality as if they were manufactured by himself.

**Acetanilide.**—The absence of aniline salts and various allied substances is to be ascertained by adding ferric chloride solution to a cold saturated solution, when the colour should not be affected.

**Acidum Benzoicum.**—The use of artificially prepared acid is recognised.

**Acidum Carbolicum.**—Correctly described as faintly acid to litmus paper. The common error is repeated that it is distinguished from creasote by the latter yielding no precipitate with albumen, whereas creasote abundantly coagulates albumen.

**Acidum Hypophosphorosum Dilutum.**—Contains 10 per cent. by weight of absolute acid. Specific gravity 1·046.

**Acidum Nitricum.**—The strength is reduced to 68 per cent. of absolute acid.

**Acidum Phosphoricum.**—The strength is increased to 85 per cent. by weight of absolute acid.

**Acidum Salicylicum.**—The use of artificially prepared acid is recognised. Described as light, fine, white, prismatic needles, or a crystalline powder. Melting point 156° to 157° C.

**Acidum Stearicum.**—The more or less impure commercial kind. Melting point not lower than 56° C., and solidifying point not lower than 54° C.

**Acidum Sulphuricum.**—The strength is reduced to 92·5 per cent. of absolute acid. Specific gravity is to be not less than 1·835.

**Acidum Sulphurosum.**—The strength is increased to 6·4 per cent. sulphur dioxide.

**Æther.**—The 74 per cent. ether is now omitted, and the official ether contains about 96 per cent. ethyl oxide. Specific gravity 0·725 to 0·728.

**Æther Aceticus.**—Contains about 98·5 per cent. ethyl acetate. Specific gravity 0·893 to 0·895. Boiling point about 76° C.

**Alcohol Absolutum.**—Not to contain more than 1 per cent. of water by weight. Specific gravity not higher than 0·797.

**Alcohol deodoratum** contains about 92·5 per cent. by weight of ethyl alcohol. Specific gravity about 0 816.

**Alcohol dilutum.**—Contains about 41 per cent. by weight of ethyl alcohol. Specific gravity about 0·936.

**Aloinum.**—Defined as the neutral principle from several varieties of aloes, chiefly Barbados aloes and Socotra or Zanzibar aloes, differing in chemical composition and physical properties according to its source. The differences between barbaloin and socaloin are stated.

**Alumen** is the potassium salt.

**Amyl nitris.**—The amount of amyl nitrite is now given as about 80 per cent. When tested in the nitrometer 0·26 Gramme should yield about 40 C.c. nitric oxide.

**Antimonium sulphuratum.**—The name "Kermes mineral" is introduced as a synonym.

**Aqua Hydrogenii dioxidi.**—Contains dioxide corresponding to about 10 volumes of available oxygen. This is one of the few chemicals for the preparation of which directions are given.

**Atropina.**—As obtained in commerce it is stated to be always accompanied by a small proportion of hyoscyamine, from which it cannot be readily separated. The precipitation of mercuric oxide from mercuric chloride, by the pure base, is given as a new test.

**Barii dioxidum.**—Introduced for the preparation of aqua hydrogenii dioxidi.

**Calx chlorata.**—The amount of available chlorine is increased to 35 per cent. The term "chloride of lime" is omitted as a synonym, and its impropriety pointed out.

**Chloroformum.**—Commercial chloroform is no longer official, and the only kind of chloroform recognised corresponds to the purified chloroform of the U.S.P. 1880. It is defined as istingcons of 99 to 99·4 per cent. by weight of absolute chloroform and 1 to 0 6 per cent. of alcohol. It is to be kept in amber coloured glass stoppered bottles in a cool and dark place.

**Cocainæ hydrochloras.**—Described as colourless transparent crystals, or a white crystalline powder without odour. The melting point is given as 123° C., which is considerably above that stated by most authorities. The formation of a yellow precipitate on adding a 5 per cent. solution of chromic acid to a 2 per cent. solution of the salt, the re-solution of the precipitate on shaking and its re-formation on adding hydrochloric acid, are given as means of identification. The blackening of a mixture of the salt with calomel when breathed upon is also given, but this reaction cannot be relied upon, as it also takes place with pilocarpine. The permanence of the pink tint produced on adding a drop of permanganate solution to a 2 per cent. solution of the salt is given as an indication of the absence of cinnamyl cocaine and other bases derived from coca.

**Creosotum** is now defined as a mixture of phenols, chiefly guaiacol and cresol, obtained from wood tar, preferably that of beech wood. Specific gravity not below 1·076. Begins to boil about 205° C., and most of it distils over between that point and 215° C.

Eucalyptol.—Specific gravity 0 930. Boiling point 176° to 177° C. Optically inactive; solidifies below 0° C. to a mass of needle-shaped crystals, which liquefy at - 1° C.

Ferri et Quininæ citras solubilis.—A scale preparation corresponding to that of the B.P., but containing only about 12 per cent. of quinine.

Ferri phosphas solubilis.—This name is now applied to the ferri phosphas of the U.S.P. 1880.

Ferri pyrophosphas solubilis.—The ferri pyrophosphas of the U.S.P. 1880.

Hydrastininæ hydrochloras.—Defined as the salt of an artificial alkaloid obtained from the colourless hydrastine.

Hyoscinæ hydrobromas.—Defined as the salt of an alkaloid ($C_{17}H_{21}NO_4$) obtained from hyoscyamus. The identification tests are not very precise, and would not distinguish the salt derived from *Scopola.*

Hyoscyaminæ hydrobromas.—Described as a yellowish white amorphous resin-like mass, or prismatic crystals, having a tobacco-like odour, particularly when damp, and an acrid, nauseous, bitter taste. Melting point 78° C. Crystallisation of the gold salt in lustrous golden yellow scales, from boiling water acidulated with hydrochloric acid, is given as the character distinguishing the hyoscyamine salt from the corresponding atropine salt.

Menthol.—Defined as a stearopten having the character of a secondary alcohol, obtained from the official oil of peppermint (from *Mentha piperita*, Smith) or from Japanese or Chinese oil of peppermint (from *Mentha arvensis*, Linné, var. *piperascens*, Holmes, and *Mentha canadensis*, Linné, var. *glabrata*, Holmes). Melting point 43° C. Boiling point 212° C.

Methyl Salicylate.—The artificial product. This is the third form of methyl salicylate that is official.

Naphtalinum.—Melting point 80° C. Boiling point 218° C.

Naphtol.—Melting point 122° C. Boiling point 286° C.

Oleatum Zinci.—The rule adopted in regard to chemical names is here departed from, and the English name given to this preparation is "oleate of zinc." That is also the case with oleatum hydrargyrii and oleatum veratrinæ.

Paraldehydum.—Defined as a polymeric form of ethylic aldehyde. Solidifies near 0° C. to a crystalline mass, which melts at 10·5. Boiling point 123° to 125° C.

Physostigminæ sulphas.—Melting point 105° C.

Pyrogallol.—Defined as a triatomic phenol obtained chiefly by the distillation of gallic acid. Melting point 131° C.

Resorcinum.—Defined as a diatomic phenol. Melting point 110° to 119° C., the higher melting point indicating a greater degree of purity.

Salol.—Defined as the salicylic ether of phenol. Melting point 42° to 43° C.

Sodii nitris.—Introduced for the preparation of spiritus ætheris nitrosi.

Sparteinæ sulphas.—Melting point of the dry salt 136 C.

Strontii Bromidum.—Soluble in 1·05 part of water at 15° C., and 0·5 at 100° C.

Strontii Iodidum.—Soluble in 0 6 part of water at 15° C., and 0 5 at 100° C.

Strontii Lactas.—Soluble in about 4 parts of water at 15° C., and less than 0·5 at 100° C.

In taking a survey of the galenical preparations, it is impossible to avoid being impressed with the admirable result of the work done by the Committee of revision. It is evident that a considerable use has been made of the best pharmaceutical work of the past ten years.

Only two vinegars are now official, those of opium and squill. Both are to be prepared with diluted acetic acid and by maceration, instead of percolation as directed in the U.S.P. 1880. With a watery fluid such as dilute acetic acid, and a drug of the nature of squill, percolation was most unsuitable.

Aqua Anisi and five other aromatic waters are now prepared by triturating the oil with precipitated calcium phosphate, adding water gradually, and filtering. This is no doubt an improvement on the old method of dropping the oil on cotton wool, or rubbing down with magnesia. Phosphate of calcium is very insoluble, and diffuses well in water, thus offering a large surface of oil for solution.

Aqua aurantii florum is not now prepared directly by distillation, but by mixing a strong distilled product with an equal volume of water.

Aqua aurantii florum fortior is a saturated solution of the volatile oil of fresh orange flowers, obtained as a bye-product in the distillation of the oil of orange flowers.

Aqua rosæ fortior is a similar product, and is used for preparing aqua rosæ in the same manner.

Aqua chloroformi is to be prepared in the manner directed in the B.P., taking care there is always an excess of chloroform present.

Aqua creosoti is to be prepared by shaking creosote with water and filtering through a wetted filter.

The cerates, which remain official, are not altered, with the exception of ceratum camphoræ, now made with white wax and oil, and ceratum cantharidis, which contains oil of turpentine.

Charta sinapis is now prepared by mixing black mustard—extracted by benzin—with a solution of indiarubber in benzin and carbon disulphide, and spreading upon paper. This is a marked advance on our B.P. method. Manufacturers of mustard plasters have always used caoutchouc as the adhesive material.

Confectio rosæ.—In this preparation stronger rosewater is now used.

Confectio sennæ.—Oil of coriander is now used in the place of the powdered seed, but coriander fruit is still retained and stated to be used in the preparation of confectio sennæ.

Decocta are now to be prepared of 5 per cent. strength when not otherwise directed by the physician. The formula of decoctum cetrariæ is correspondingly altered: that of decoctum sarsaparillæ co. remains the same as in the U.S.P. 1880.

Elixir Aromaticum, substituted for elixir aurantii, U.S.P. 1880, is prepared by mixing compound spirit of orange with deodorised alcohol, and adding syrup and water; then mixing with precipitated calcium phosphate, and filtering through a wetted filter till a clear liquid is obtained. This elixir partakes of the character of the liqueurs of the Chartreuse and Mareschino type.

Elixir Phosphori is prepared by mixing spirit of phosphorus, oil of anise, and glycerin, until they form a clear liquid, and then adding aromatic elixir to make up the required volume. From the amount and variety of organic matter in this preparation it may be doubted if it would keep well.

Thirteen plasters are now official; seventeen were contained in the U.S.P. 1880. The plasters of ammoniacum, asafœtida, galbanum, and Canada pitch have been deleted. If they were as little used in America as in this country it was wise to turn them out.

Emplastrum Ammoniaci cum Hydrargyro.—In this preparation the olive oil and sulphur are omitted, and oleate of mercury is substituted for the reduction of the mercury.

Emplastrum Belladonnæ.—Alcoholic extract of belladonna leaves is now used in place of the extract of belladonna root, and soap plaster is added. This gives a plaster of the old favourite green colour, and no doubt as regards activity is quite equal to a plaster made from root extract. The strength is one of extract in five of plaster, an amount which we venture to say is excessive. It will often give rise to belladonna rash, dryness of the throat, and dilated pupils.

Emplastrum Ferri.—Olive oil is now used instead of Canada turpentine.

Emplastrum Hydrargyri.—Oleate of mercury is used for reducing the mercury, and the olive oil and resin are omitted.

Emplastrum Picis Burgundiæ.—Olive oil is now added to the Burgundy pitch and yellow wax.

Emplastrum Plumbi.—The process is clearly detailed. Care is taken to wash out the glycerin, and to ensure by additions of water a well hydrated lead oleate.

Emulsum Ammoniaci.—The name now given to mistura ammoniaci, U.S.P. 1880.

The term emulsion is also applied to mistura amygdalæ and mistura asafœtida, U.S.P. 1880.

Emulsum Chloroformi.—The mistura chloroformi, U.S.P. 1880; it is now to be made with tragacanth and oil of almonds, and to contain only half the former amount of chloroform.

Of extracts there are thirty-three solid and eighty-seven fluid. In the formulæ for most of the solid extracts glycerin has been omitted, but when it is desired to preserve extracts in a plastic condition the addition of 10 per cent. of glycerin is recommended in the preliminary notices.

Extractum Aconiti.—Now prepared by percolating aconite with alcohol and omitting tartaric acid and glycerin.

Extractum aconiti fluidum is prepared in a similar manner.

| | |
|---|---|
| Extractum Apocyni fluidum<br>Extractum Aspidospermatis fluidum<br>Extractum Castaneæ fluidum | 10 per cent. of glycerin is to be mixed with the alcohol used for percolation. |
| Extractum Chimaphilæ fluidum<br>Extractum Chiratæ fluidum<br>Extractum Leptandræ fluidum<br>Extractum Matico fluidum<br>Extractum Sarsaparillæ fluidum | The glycerin is to be omitted. |

Extractum Colchici Radicis.—Acetic acid (35 per cent.) has been introduced.

Extractum Conii.—Acetic acid (2 per cent.) has been substituted for hydrochloric acid.

Extractum Nucis Vomicæ.—The amount of alkaloid is now fixed at 15 per cent.

Extractum Nucis Vomicæ fluidum.—The amount of alkaloid is now fixed at 1·5 Gm. in 100 C.c.

Extractum Opii is to contain 18 per cent. of morphine.

There are six glycerin preparations, several of which are new.

Glyceritum Acidi Carbolici, containing 20 per cent. carbolic acid.

Glyceritum Acidi Tannici, containing 20 per cent. tannic acid.

Glyceritum Boroglycerini, containing 31 per cent. boric acid.

Glyceritum Hydrastis, prepared by extracting hydrastis with alcohol by percolation, evaporating off the alcohol, adding water, and mixing the filtered liquid with glycerin.

The twenty-four solutions which have been retained are not materially altered.

Liquor Ferri Citratis.—The standard of this solution is now 7·5 per cent. of metallic iron.

Liquor Ferri et Ammonii Acetatis.—This is the mistura ferri et ammonii acetatis of the U.S.P. 1880; in the formula for it, aromatic elixir is now substituted for elixir of orange, and glycerin (10 per cent.) is added.

Several of the mixtures of the U.S.P. 1880 are now named emulsions, and the mixture of acetate of iron and ammonia (1880) is now classed with the solutions.

Mistura Glycyrrhizæ Composita is now to be made with syrup and mucilage of acacia.

Mistura Rhei et Sodæ.—Fluid extract of ipecacuanha and glycerin are now added.

There are fifteen formulæ for pills and three masses.

Pilulæ Catharticæ Vegetabiles consists of compound extract of colocynth, extracts of hyoscyamus, jalap, leptandra, resin of podophyllum, and oil of peppermint.

Pilulæ Antimonii Compositæ are to be made up with castor oil instead of tragacanth mucilage.

Pilulæ Ferri Carbonatis (Blaud's pills) have been substituted for the pilulæ ferri compositæ of the U.S.P. 1880.

Pilulæ Phosphori.—The proportion of acacia is considerably increased.

There are nine powders, the formulæ of which are mostly unaltered.

Pulvis Glycyrrhizæ Compositum.—Oil of fennel is substituted for powdered fennel ordered in the U.S.P. 1880.

The official spirits are twenty-five in number.

Spiritus Ætheris Nitrosi is now to be prepared by diluting ethyl nitrite, made by distilling a mixture of sodium nitrite, dilute alcohol, and sulphuric acid. It is to contain about 4 per cent. ethyl nitrite, and yield not less than eleven times its volume of nitrogen dioxide.

Spiritus Ammoniæ Aromaticus is somewhat weaker than that of the U.S.P. 1880. The specific gravity is 0·905.

Spiritus Amygdalæ Amaræ is a solution of oil of bitter almond (1 per cent.) in dilute alcohol.

Spiritus Aurantii Compositus is an alcoholic solution of the oils of orange peel, lemon, coriander, and anise.

Spiritus Glonoini is a 1 per cent. solution of nitroglycerin in alcohol.

Spiritus Phosphori, a solution of phosphorus (0·12 per cent.) in absolute alcohol.

There are thirty-one syrups in addition to simple syrup, which is now to be made with 85 per cent. of sugar, and of the specific gravity about 1·317.

Syrupus Acidi Hydriodici is now to be made by mixing a solution of potassium iodide and potassium hypophosphite with a solution of tartaric acid in alcohol, evaporating the filtrate and adding syrup.

Syrupus Altheæ.—10 per cent. (by measure) of glycerin is to be added.

Syrupus Calcii Lactophosphatis is now to be made by dissolving calcium carbonate (25 Gm.) in lactic acid (60 C.c.) diluted with water, adding phosphoric acid (36 C.c.), and triturating until the precipitate formed is redissolved, filtering, adding orange-flower water (25 C.c.), and dissolving the sugar in the clear liquid by the aid of heat.

Syrupus Ferri Iodidi is to be made by mixing a solution of ferrous iodide with syrup.

Syrupus Ferri Quininæ et Strychninæ Phosphatum is to be made by adding to a water-solution of soluble ferric phosphate (20 Gm.), phosphoric acid (48 C.c.), quinine sulphate (30 Gm.), strychnine (0·2 Gm.), filtering into glycerin (100 C.c.), and adding syrup to make 1000 C.c. The amount of strychnine in this preparation is reduced to one half that ordered in the U.S.P. 1880.

Syrupus Hypophosphitum.—A larger proportion of the calcium salt is ordered, citric acid has been omitted, and 0·2 per cent. diluted hypophosphorous acid introduced in its place.

Syrupus Hypophosphitum cum Ferro.—1 per cent. of potassium citrate has been added.

Syrupus Ipecacuanhæ is to be made by diluting fluid extract of ipecacuanha with water, adding acetic acid (1 per cent.), filtering, adding glycerin (10 per cent.), and dissolving the sugar in the mixture, suitably diluted, which may be done in a percolator.

Syrupus Lactucarii is to be prepared by triturating tincture of lactucarium with precipitated calcium phosphate, some sugar and water, then dissolving the remainder of the sugar in the filtered liquid.

Syrupus Picis Liquidæ.—10 per cent. (measure) of glycerin is now added.

Syrupus Rhei.—Spirit of cinnamon is substituted for the bruised cinnamon ordered in the U.S.P. 1880.

Syrupus Sarsaparillæ Compositus.—The formula has been entirely altered, the fluid extracts of sarsaparilla, of glycyrrhiza, and of senna, with oils of sassafras, of anise, and gaultheria, being ordered in the place of the crude drugs.

Syrupus Scillæ Compositus.—The fluid extracts of squill and of senega are substituted in the place of the crude drugs.

Syrupus Tolutanus, the balsam of tolu, is to be dissolved in five parts of alcohol, the solution incorporated with calcium phosphate and some of the sugar; after evaporating off the spirit this mixture is to be triturated with water and the rest of the sugar dissolved in the filtered liquid.

Syrupus Zingiberis.—The fluid extract is to be triturated with calcium phosphate, the alcohol evaporated off, and the trituration then continued with the requisite quantity of water, the sugar being then dissolved without heat in the filtered liquid.

The number of tinctures now official amounts to seventy-one.

Tinctura Aconiti.—The tartaric acid has been omitted.

Tinctura Aloes.—Powdered liquorice root has been substituted for extract of glycyrrhiza.

Tinctura Aloes et Myrrhæ.—10 per cent. of powdered liquorice root powder is introduced.

Tinctura Cinnamomi.—5 per cent. of glycerin is added.

Tinctura Lactucarii is to be made by percolating lactucarium (first extracted by benzin) with a mixture of glycerin, alcohol, and water.

Tinctura Opii and Tinctura Opii Deodorati. – 50 per cent. of precipitated calcium phosphate is ordered to be mixed with the powdered opium before macerating with water.

Tinctura Quillajæ—20 per cent. tincture—is to be made by adding alcohol to a decoction of quillaja sufficiently concentrated.

In making tinctura rhei, tinctura rhei aromatica, and tinctura rhei dulcis, 10 per cent. of glycerin (by measure) is to be added to the diluted spirit before percolating.

Tinctura Sanguinariæ is now to be made with the addition of 2 per cent. acetic acid.

Tinctura Strophanthus is a 5 per cent. tincture.

There are fifteen official troches.

Trochisi Ammonii Chloridi.—The proportion of tragacanth is slightly increased, and the sugar is partially replaced by 25 per cent. of extract of glycyrrhiza in fine powder.

Trochisi Cretæ.—Spirit of nutmeg is to be used instead of the preserved nutmeg ordered in the U.S.P. 1880.

Trochisi Glycyrrhizæ et Opii are to be made with powdered opium instead of extract of opium.

Trochisi Santonini.—The formula differs from that of the U.S.P. 1880, for which it is substituted in ordering 3 per cent. santonin in place of the sodium santoninate formerly used, and there is a corresponding alteration in the name of the preparation.

The ointments are now twenty-three in number.

Unguentum Acidi Carbolici.—The amount of carbolic acid is reduced to 5 per cent.

Unguentum Acidi Tannici. —The amount of tannic acid is increased to 20 per cent.

Unguentum Aquæ Rosæ (cold cream).—Sodium borate in fine powder (0·5 per cent.) is introduced, and it is to be dissolved in the rosewater before that is stirred in.

Unguentum Hydrargyri.—Mercury oleate is to be used for reducing the mercury instead of tincture of benzoin and mercurial ointment.

Unguentum Hydrargyri Oxidi Rubri.—5 per cent. of castor oil is introduced, and the oxide is first to be rubbed with that to a smooth mixture before incorporating the ointment.

Unguentum Picis Liquidæ is to be made with lard and yellow wax instead of suet.

Unguentum Stramonii.—The extract is first to be rubbed down with diluted alcohol.

Unguentum Sulphuris.—Washed sulphur is substituted in the place of sublimed sulphur.

Unguentum Veratrinæ.—The alcohol in the U.S.P. 1880 is replaced by an equal quantity of olive oil (6 per cent.).

Unguentum Zinci Oxidi.—The oxide is to be sifted on to the surface of the melted benzoated lard and incorporated by stirring.

Only eight wines are now official, in addition to white and red wine. The formulæ have undergone but little alteration, an addition of alcohol in the case of the wines of antimony, colchicum, ergot, ipecacuanha, and opium, being sufficient to make the amount of alcohol rather more than it was when the vinum album fortius of the U.S.P. 1880 was used.

Vinum Ferri Amarum is to be made with the scale citrate instead of the solution formerly used.

## OCCURRENCE OF BETAINE AND CHOLINE IN WORMSEED.

In the examination of *Artemisia gallica*, Wild., by Heckel and Schlagdenhauffen,[*] they found it to contain, besides santonin and other substances, an alkaloid the presence of which was the more remarkable since nothing of the kind had been observed in other varieties of Artemisia. Flückiger[†] suggested that the occurrence of santonin in *Artemisia gallica*, which is considered by some botanists to be a variety of *Artemisia maritima*, L., favours the botanical relation of that plant to the Asiatic *Artemisia cina*, which yields the official wormseed. The latter has since been referred also to *Artemisia maritima* as the variety *Pauciflora*. On that account it seemed remarkable that Flückiger failed to obtain from wormseed the alkaloid which was partially described by Heckel and Schlagdenhauffen.

E. Jahns[‡] has therefore made a further examination of wormseed, and he has succeeded in ascertaining the presence of bases which proved to be betaine and choline. To obtain these bases the wormseed was extracted several times with hot water and the liquor precipitated with lead acetate and soda. The filtered liquor, freed from lead by addition of sodium phosphate, evaporated to a very small bulk, and acidulated with sulphuric acid, was shaken with chloroform, which removed a resinous bitter substance and traces of santonin which had been dissolved. From the aqueous liquor, mixed with a large proportion of sulphuric acid, the bases were then precipitated by potassium bismuth iodide, the precipitate washed with dilute sulphuric acid, and the bases then separated by digestion with freshly precipitated silver carbonate and water.

The separation of the two bases was effected by treatment of their hydrochlorides with absolute alcohol, in which choline hydrochloride dissolves readily, while scarcely any betaine hydrochloride is dissolved.

Choline was identified by the characters of the base in the free state, as well as by the gold and platinum salts. The former melts at 244°-245° C., the latter crystallises from water in six-sided plates and from dilute alcohol in hydrated octahedrons.

The betaine hydrochloride was purified by repeated recrystallisation from alcohol of 80 per cent. It separated on cooling the hot saturated solution as fine prisms, often several centimetres in length. From a water solution it crystallises in monoclinic plates. The salt melts at 227°-228° C. with frothing. As a further proof of identity of the wormseed base with betaine, it was found to have in the free state all the characters of betaine, and on fusion with caustic potash it yielded trimethylamine.

The amount of betaine in wormseed is about 0·5 per cent., that of choline nearly 0·1 per cent.

The above mentioned bitter substance was not more closely examined. It was a yellowish resinous mass, sparingly soluble in boiling water, readily soluble in alcohol, ether, chloroform, or benzene. It appeared to be in some respects analogous to santonin, and probably partakes of its efficacy as an anthelmintic.

## THE STARCHES IN SUBTERRANEAN STEM DRUGS.[*]

BY ED. S. BASTIN.

In a preceding article (see *Pharm. Journ.*, [3], xxiii., 747 and 769) an account was given of the starches contained in the most important of the root drugs. In the present one it is proposed to give a similar account of those that occur in the more important of the underground stems that are employed as medicine.

In most cases several different samples of the same drug have been studied. In those cases where the drug includes the attached rootlets as well as the rhizome, no considerable differences have been observed between the starches of the rhizome and those of the roots of the same species.

As was to be expected, some subterranean stem drugs are destitute of starch, other related substances taking its place functionally. For example, none occurs in *Iris versicolor*, in *Triticum repens*, in *Polygonatum giganteum*, and in *Arnica montana*. The fleshy scales of the bulbs of *Urginea scilla* and of *Allium sativum* are also destitute of it. Other drugs, as *Cypripedium pubescens* and *Spigelia*, contain it in small proportion, while most of the remainder studied contain it in abundance. Some rhizomes, however, as that of *Geranium maculatum*, contain it abundantly in the season of rest, but are nearly destitute of it in the actively growing period.

It will be observed that some of the starches, as those of zingiber, galanga, colchicum, orris, geranium, caulophyllum, and jalap, are strongly characteristic, while the rest are much less so, but still in most instances would serve as important aids in the identification of the drugs and in detecting adulterations.

### *Aspidium.*

The specimen studied was *A. marginale*. The grains are sometimes rounded in outline, but more commonly elongated or irregular, and they are often flat or thin. The hilum is variable in position, sometimes near the centre, at others well toward the end. Rarely one or two stratification lines may be observed. Very few grains show a cross with polarised light.

### *Ginger.*

The parenchymatous tissue of ginger contains starch in great abundance. The large grains are mostly ovate but sometimes elliptical in outline and decidedly flattened. The hilum is distinct and located close to one end, and that the smaller one, where there is a difference. It is occasionally, though rarely, slightly fissured. The grains are sometimes fissured across near the middle or broken in two. Eccentric stratification lines are frequently faintly visible on the larger grains, if the light be properly manipulated. The polarisation cross is very unequal-armed.

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[*] *Comptes rendus*, 1885, 100, 804.

[†] *Archiv. der Pharm.*, 224, 10.

[‡] *Berichte der Deutschen Chem. Gesellschaft*, 26, 1493.

[*] From the *Apothecary* for June.

*Galanga.*

The grains of this starch, like those of ginger, are large and have the hilum eccentric, but here the resemblance ends. The grains are mostly long ovate in outline but frequently somewhat irregular, the hilum is located near the larger end, is commonly fissured, and from the fissure delicate branching striæ run toward the smaller end. The eccentric stratification curves are faint, but, in good light, not very difficult to detect on the larger grains.

*Calamus.*

In this drug the starch is abundant but small-grained, and the grains show no very characteristic structure. They are oblong, rounded, or more or less irregular in form, with a central or subcentral hilum and no observable stratification lines. Some grains are double and treble, and others show one or two flat surfaces. Few are large enough to show the polarising cross. This, when visible, is nearly equal-armed.

*Orris.*

Only one specimen of orris root was studied, and it was uncertain from which of the species constituting the source of this drug the specimen was derived. Whether the starches of *Iris florentina*, *I. pallida*, and *I. germanica* are all similar, or whether there are characteristic differences, are problems which remain to be investigated. The starch of the specimen studied is, however, quite characteristic. The grains are very abundant in all the soft tissues of the peeled rhizome. Most of them are elongated, rounded at one end, and tapering toward the other, which is usually truncate. Some of the grains, however, are three-lobed, with one of the lobes truncate. Other grains take somewhat irregular forms. In the typical kind, first described, the hilum is located near the larger end and surrounded by one or more stratification curves.

*Veratrum Album.*

The parenchyma of this drug is abundantly supplied with small, usually spherical or spheroidal, starch grains, having a central hilum. In the larger grains one or more stratification lines are sometimes faintly discernible. Double grains are occasionally seen, and single ones with one, or rarely more than one, fracture surface. In the few grains large enough to show the polarisation cross, that is rectangular and equal-armed.

*Veratrum Viride.*

There is such a close general resemblance between this starch and that of *Veratrum album* that it is doubtful whether the two drugs could be distinguished by the starches alone. The chief differences between them, so far as I have been able to determine from the specimens at hand, are that the hilum in *Veratrum viride* is rather more distinct, and a much larger number of grains are compound—triple, quadruple, and even sextuple grains not being infrequent. But a much larger number of specimens from different localities should be examined to determine whether these differences are constant.

*Symplocarpus.*

The grains of this starch are so minute as to appear almost structureless under a magnifying power of 875 diameters. Neither hilum nor stratification lines are discernible, and they do not show a cross by polarised light. This drug, unimportant in itself, has attention directed to it because it has been observed recently that it is sometimes substituted for *Veratrum viride.* The rhizomes are cut into quarters longitudinally, without removing the rootlets, and dried. They then bear a close general resemblance to the genuine drug. Fresh and perfect specimens are, of course, readily distinguishable from the latter by the coarser rootlets, the thicker cortex, the larger wood bundles in the cortex, and by their possession of relatively few overlapping leaf-bases at the top, as well as by the odour and taste; but in the case of fragmentary or imperfect specimens, in which many of the above characters are difficult to observe, the marked difference in the starches would afford a most convenient and certain means of discriminating between them.

*Cypripedium.*

The starch of *Cypripedium pubescens* was examined, but not that of *C. parviflorum.* The drug contains but a small proportion of starch, and this is small grained, and has no very characteristic structure. The grains are angular, flattened, with a sub-central hilum and without perceptible stratification lines. They are not infrequently double or triple. It is difficult, even in the larger grains, to observe any cross by polarised light.

*Dioscorea Villosa.*

The rhizomes contain starch in abundance throughout the parenchymatous tissues. The grains are sometimes rounded, or more commonly oblong, more or less angular or obscurely many-sided, usually simple, but sometimes double, triple, or multiple, hilum central, and rarely surrounded by one or two faint stratification lines. There is not infrequently a straight or angular fissure through the hilum, and this is surrounded like a penumbra with an area which refracts the light differently from the rest of the grain, and is usually stellate or angular in form.

(*To be continued.*)

## PRODUCTION OF OLIVE OIL IN SICILY.

Olive oil is made in Southern Sicily with hand machinery of ancient origin. The average season for grinding and pressing olives is from the last days of September to the end of November, although a large yield prolongs it into January. The United States Consul at Catania says that the olive trees grow equally well in the valleys and on the mountain sides, but olives of the lowlands are considered richer, and the oil made from them keeps its excellence for three years, while oil of the drier olives on the heights is not good after three years. The grinding and pressing are done in one room of a building, which, like all the farm buildings, is but one storey high, and usually has the earth for a floor. The olives are ground on a circular platform of solid masonry, about one metre high and two metres wide. The surface inclines towards the centre, in which stands a stout upright piece of wood. Parallel to this, and at right angles with the platform, is affixed a millstone some thirty centimetres broad and weighing about 800 kilogrammes. Into this wheel is fastened a heavy pole, to which a donkey or mule is fastened. The stone revolves very slowly, and a man with a spade is engaged in constantly turning the pulp. About 100 kilogrammes are crushed in half an hour, and the mass is then carried to the press in soft rush baskets. About fifteen of these baskets are filled and piled symmetrically in the press, with the openings of the baskets in each case uppermost. Several pieces of wood are placed on the top of the pile, and a beam, which is held in place by four heavy poles, two at each end, is let down on the whole. A large wooden screw, above the middle of the beam, is turned by a lever worked by six or eight men, and a great pressure is thus brought to bear upon the crushed olives. The oil runs freely and passes through a trough into a hogshead underneath, this hogshead being nearly filled with water, through which the impurities tend to fall to the bottom. The pulp is left under pressure about five minutes, when a couple of quarts of boiling water, thrown on the pulp, washes the exposed sides of the baskets. The screw is then unturned, and the olives are taken to the mill, to be ground a second time for half an hour, while another mass is in the press. This process is gone through three times, when the thrice-ground and thrice-preserved pulp is taken into a dark room, banked up, and left there for three days, by which time it has attained a high temperature. It is then put into the mill again, and, after being ground, is pressed a fourth and last time. The remaining pulp—which, out of every 100 kilogrammes, averages 70 kilogrammes—is sold, and sent out of Sicily, to be worked again by more powerful machinery. Formerly, it was sold to the bakers for burning in their ovens, but the bakers now buy it after the fifth pressing. In the pressing, one half of the oil is obtained under the first pressure. The remaining quantity is extracted in nearly equal quantities from the other three. The fresh oil is quite green in colour, and is taken away as soon as the hogshead becomes filled. After a careful measuring, the oil is carried, usually in goatskins turned inside out, to another room, where it is poured into earthen jars, holding about 100 litres each. The jars, when new, are red and unglazed, both inside and out; and the same kind is made to-day as was used for the oil twenty years ago. The fresh oil is kept in a jar for eight days, although it clarifies at the end of four. A warm temperature is best adapted to the clarifying and preservation of the oil, but the changes of day and night do not affect the quality. At the end of eight days the impalpable foreign matter has sifted to the bottom, and the oil is ready for the table. It is then carefully poured into another jar, and awaits the pleasure of the manufacturer. After a jar is used, it is thoroughly washed with water and vinegar.—*Journal of the Society of Arts.*

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, SEPTEMBER 23, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## JOHANN MICHAEL MAISCH.

It is with deep regret that we have to record the death of the latest recipient of the Hanbury Medal within so short a space of time since the award was made. From the first news of the illness of Professor Maisch there was but little prospect that the result would be different, as the malady he suffered from was past hope. In view of the valuable services Professor Maisch has rendered to pharmacy generally, and especially in connection with the Pharmacopœia of the United States, it is strange that it should have been mere accident which threw him into that occupation. Entanglement in the political troubles by which Germany was disturbed in 1848, compelled him to forsake an intended career and escape from his native country to seek refuge in America. There the scientific education he had received enabled him to obtain employment in a pharmaceutical establishment, and no doubt at that time placed him in a specially advantageous position. Within ten years of his arrival in America he had become a contributor to the *American Journal of Pharmacy*, and been appointed a teacher of pharmacy and materia medica, in both of which occupations he continued to be engaged up to the time of his death. His contributions to pharmaceutical literature within that period are too well known to require mention, and the recognition he received from the principal pharmaceutical bodies in all countries testifies to the esteem in which he was held. Among the honourable positions he held was that of honorary member of the Pharmaceutical Society of Great Britain, and all connected with that body will regret that he did not more fully enjoy the crowning distinction of being chosen one of the Hanbury medallists.

## THE GERMAN APOTHEKER VEREIN.

The meeting of this Association, which has just taken place at Frankfort-on-the-Main, under the Presidency of Herr **Frölich**, of Berlin, was of especial interest for several reasons. It is now twenty-two years since the body which now represents the pharmacists of united Germany was constituted in Frankfort by the amalgamation of the associations severally representing North and South Germany. Since that time various changes have been made in the organisation of the Verein with the view of adapting it to altered conditions, and quite recently a change of considerable importance has been made which has a very close relation to a project which has lately attracted some notice in this country. We have on former occasions pointed out that the proceedings at the annual meetings of the German Apotheker Verein consist chiefly in the discussion of matters affecting the practical exercise of pharmacy. That system was attended with the disadvantage that the decisions arrived at in such discussions were dependent upon the more or less accidental majorities among the members happening to be present at meetings in particular localities. The alteration now introduced, and for the first time coming into operation at the Frankfort meeting this month, restricts the power of voting to delegates regularly appointed to represent the provincial sections of the Verein according to rules laid down in the new statutes. The result is a representation—not of territory but of opinion—such that decisions as to the line of action to be taken in regard to questions affecting the general interests of the body, are made subject to the desire of the majority. There is thus a possibility of a truly representative result being arrived at, and the plan by which it is effected may afford a useful hint to those who have recently advocated the adoption of a system of territorial representation in the election of members of the Society's Council.

The meeting at Frankfort was very numerously attended, more than three hundred being present. After a cordial welcome had been offered on behalf of the municipal authorities by a member of the town council, and on behalf of the local committee by Herr **Engelhard**, the **President** delivered an opening address. In referring to the loss, by death, of **Rehe**, **Korte**, **Witte**, and others, he made a graceful reference to the great services rendered by the late **Christian Brunnengräber** in promoting the welfare of pharmacy and of the Verein. The work of the Verein during the past year was then reviewed, and various topics of interest were touched upon, amongst others the trade in specialties and the patenting of medicinal preparations, both of which gave rise to some animated discussion. In reference to these subjects Herr **Frölich** remarked that though it is impossible, and indeed undesirable, to put a stop to the trade in medicinal specialties, it is the business of pharmacists energetically to oppose the malpractices carried on with them, adding, "If we do not do so, we shall reduce ourselves to hucksters."

During the meeting an address was delivered on the subject of pharmaceutical education by Dr. **Hilger**, of Munich, and one upon methods of sterilisation by Dr. **Landmann**, of Frankfort. Reports were presented upon the statutory tariff for medicines, and upon the revision of the Arznei-book by the Committees entrusted with the consideration of those subjects. At the conclusion of the meeting Herr **Frölich** was re-elected President, and it was decided that the meeting next year should take place at Cassel.

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## A PUBLIC ANALYST'S ACCURACY.

Our attention has been directed to the official report of the public analyst for the parish of Camberwell, in which he refers to the recent unsuccessful soda water prosecution (see *ante*, page 98) in a manner that betokens a somewhat disturbed equanimity. Otherwise, it is difficult to comprehend that an individual occupying an official position should commit himself by publishing so many misstatements and perversions of facts. In the first place, the incorrect statement is made that the defendant in the case was a pharmaceutical chemist, instead of being registered as a chemist and druggist only, but this is doubtless a very small matter to a public analyst who considers the expression of opinion as to the application of the British Pharmacopœia part of his official duty. Further, it is stated that "the defence in this case consisted mainly in a statement that soda water prepared according to the British Pharmacopœia was undrinkable," and that if "such an excuse be valid in law no drug prosecution could succeed."

In this attempt to discredit the magistrate's decision the analyst conveniently ignores the fact that the magistrate distinctly challenged the authority of the B.P. in such matters, and, as we have previously shown (see *ante*, pages 93 and 110), there is no ground whatever for assuming that the authority of that work extends to dietetic articles or that it should control their composition. Time after time reports are published of cases in which public analysts, apparently none too sure of their position, produce the Pharmacopœia as evidence in support of their analyses, though it is totally irrelevant to the matter in question, and only serves to mask the real issue. We fear, however, that these worthy, but occasionally too zealous and dictatorial, servants of the public will be likely to find the B.P. more than ever a yielding staff, affording support of questionable value, if any at all. To proceed, it is not to be wondered at that Mr. **Teed** should "have grave doubts" whether any added bicarbonate of soda was present in the inculpated sample of water, seeing that he is acquainted with natural waters used for potable purposes containing more than a grain and a half of this compound to the pint. But is such a natural water likely to be used by a London manufacturer of aerated waters, and was it used in this case? It would have been a very simple matter to ascertain the actual facts before giving utterance to an extra-judicial opinion, possessing no weight, but calculated to cast a slur upon the successful defendant.

Finally, the analyst goes far out of his path to refer to the Birmingham vinegar appeal case, when Professor ATTFIELD said—what should appear self-evident to any unprejudiced person—that there is no one fluid that can claim the name of vinegar, the name being a generic term. In this analyst's report, however, the facts are somewhat distorted, for, after the remark that some prosecutions for the sale of defective vinegar have been successfully conducted, there is the following remarkable paragraph. "The British Pharmacopœia gives a rigid definition of vinegar, and yet one of the editors of this official publication endeavoured, though unsuccessfully, to persuade the Court that the definition he gave in Court, for the defence, superseded the definition given in his official capacity. This remarkable man, the Janus of the profession, gave evidence for the defence in your soda water prosecution alluded to above." Comment is here superfluous, but we would remark that, whilst the comparison, evidently intended in an objectionable sense, is—owing perhaps to ignorance of the exact meaning of the mythological reference—really a compliment, it is plainly to be seen that Mr. TEED, in losing his temper, has also forgotten his manners. We do not know whether he is a member of the Society of Public Analysts or whether that Society has yet formulated a code of ethics, but it is quite manifest that neither his accuracy nor his politeness would suffer were he placed under the restrictions of such a code.

## PROSECUTIONS AT EDINBURGH.

A NUMBER of cases of infringement of the Pharmacy Act were heard at the Edinburgh Sheriff Court on Thursday, and just as we are going to press a telegraphic report of the results has reached us. JAMES JOHNSTON (two penalties claimed), 88, Grove Street, Edinburgh, and 164, Leith Walk, Leith; ALEXANDER SIMPSON, 67, Dalry Road, Edinburgh; and ROBERT C. HUNTER, 28, West Preston Street, Edinburgh, all drysalters, were charged with keeping open shop for the sale of poison (oxalic acid), they not being registered as chemists and druggists. Also, JOHN I. MURDOCH, 49, Leith Walk, Leith, and JAMES LOGAN, at the same address—both assistants in the service of the Scottish Drug Depôt, Limited—were sued, the former for three penalties, and LOGAN for two, for selling laudanum, opium, and chloroform, they not being registered as chemists and druggists. The defendants were all found guilty of the offences charged, and fines, with costs, were inflicted in each case.

## SHEFFIELD SCHOOL OF PHARMACY.

THE ninth session of this School will be opened on Thursday, October 12, when the inaugural address to the students will be delivered by Mr. JOHN HARRISON, J.P., of Sunderland, Member of Council of the Pharmaceutical Society of Great Britain. Subsequently, the annual dinner of the Sheffield Pharmaceutical and Chemical Society will be held at the Masonic Hall, Surrey Street.

## PHARMACEUTICAL EDUCATION AT PLYMOUTH.

WE are requested by Mr. FREEMAN W. HUNT, local secretary at Plymouth, to state that the committee of the Technical School in that town has favourably considered an application, made on behalf of the local pharmacists, to establish a class in Materia Medica during the coming session. Application must be made to the Secretary of the School, and it is trusted that the class may receive a full measure of support.

## STERILISING WATER BY BOILING.

THE *British Medical Journal* quotes from *The Berliner klinische Wochenshrift* a description of the Siemens apparatus for sterilising water by boiling, which has been recently improved, the inflow of fresh water being now automatically regulated so that the temperature may always be maintained at the boiling point. The water entering the heated vessel passes through a coiled tube which is surrounded by the outflowing stream. Thus the former is appreciably heated before entering the boiler, whilst the sterilised liquid is somewhat cooled. Thirty litres per hour of sterilised water may be obtained, at a cost of less than two shillings per thousand litres for the gas consumed. Experiments with dirty water, and with water highly polluted with cholera and typhoid bacilli, yielded results in every way satisfactory, even when the temperature of the water was not raised above 80° C.

## KEW BULLETIN.

IN accordance with the principle laid down by Government, information of public interest in economic botany has been published in the *Kew Bulletin* as speedily as possible, and the articles have been necessarily printed in a disconnected form. It has therefore been decided to bring together, from time to time, the whole of the published papers relating to one particular subject, and the first volume, dealing with the subject of vegetable fibres, is now in course of preparation. This will contain, amongst other matters, the first complete account up to date of the sisal hemp industry in Yucatan and the Bahamas.

## DONATION TO A LIBRARY.

AMONG recent donations to the reference library of Tullie House, Carlisle, recorded in the *Carlisle Express* of the 9th inst., we notice that a number of works have been presented by Mr. JAMES FOSTER, a member of the Pharmaceutical Society. These include twenty volumes of the *Pharmaceutical Journal*, which record the great advances made in chemical science during a period of as many years.

# The British Association for the Advancement of Science.

## SIXTY-SECOND ANNUAL MEETING.

### THE PRESIDENT'S ADDRESS.

*(Concluded from page 236.)*

### THE SPECIFIC ENERGIES OF THE ORGANISM.

When, in 1826, J. Müller was engaged in investigating the physiology of vision and hearing, he introduced into the discussion a term, "specific energy," the use of which by Helmholtz* in his physiological writings has rendered it familiar to all students. Both writers mean by the word energy, not the "capacity of doing work," but simply *activity*, using it in its old-fashioned meaning, that of the Greek word from which it is derived. With the qualification "specific" it serves, perhaps, better than any other expression to indicate the way in which adaptation manifests itself. In this more extended sense the "specific energy" of a part or organ—whether that part be a secreting cell, a motor cell of the brain or spinal cord, or one of the photogenous cells which produce the light of the glowworm, or the protoplasmic plate which generates the discharge of the torpedo—is simply the special action which it *normally* performs, its norma or rule of action being in each instance the *interest of the organism* as a whole of which it forms part, and the exciting cause some influence outside of the excited structure, technically called a stimulus. It thus stands for a characteristic of living structures which seems to be universal. The apparent exceptions are to be found in those bodily activities which, following Bichat, we call vegetative, because they go on, so to speak, as a matter of course; but the more closely we look into them the more does it appear that they form no exception to the general rule, that every link in the chain of living action, however uniform that action may be, is a response to to an antecedent influence. Nor can it well be doubted that, as every living cell or tissue is called upon to act in the interest of the whole, the organism must be capable of influencing every part so as to regulate its action. For, although there are some instances in which the channels of this influence are as yet unknown, the tendency of recent investigations has been to diminish the number of such instances. In general there is no difficulty in determining both the nature of the central influence exercised and the relation between it and the normal function. It may help to illustrate this relation to refer to the expressive word *Aüslosung* by which it has for many years been designated by German writers. This word stands for the performance of function by the "letting off" of "specific energies." Carrying out the notion of "letting off" as expressing the link between action and reaction, we might compare the whole process to the mode of working of a repeating clock (or other similar mechanism), in which case the pressure of the finger on the button would represent the external influence or stimulus, the striking of the clock, the normal reaction. And now may I ask you to consider in detail one or two illustrations of physiological reaction—of the *letting off of specific energy?*

The repeater may serve as a good example, inasmuch as it is, in biological language, a highly differentiated structure, to which a single function is assigned. So also in the living organism, we find the best examples of specific energy where Müller found them, namely, in the most differentiated, or, as we are apt to call them, the *highest* structures. The retina, with the part of the brain which belongs to it, together constitute such a structure, and will afford us therefore the illustration we want, with this advantage for our present purpose, that the phenomena are such as we all have it in our power to observe in ourselves. In the visual apparatus the principle of *normality* of reaction is fully exemplified. In the physical sense the word "light" stands for ether vibrations, but in the sensuous or subjective sense for sensations. The swings are the stimulus, the sensations are the reaction. Between the two comes the link, the "letting off," which it is our business to understand. Here let us remember that the man who first recognised this distinction between the physical and the physiological was not a biologist, but a physicist. It was Young who first made clear (though his doctrine fell on unappreciative ears) that, although in vision the external influences which give rise to the sensation of light are infinitely varied, the responses need not be more than three in number, each being, in Müller's language, a "specific energy" of some part of the visual apparatus. We speak of the organ of vision as *highly differentiated*, an expression which carries with it the suggestion of a distinction of rank detween different vital processes. The suggestion is a true one; for it would be possible to arrange all those parts or organs of which the bodies of the *higher* animals consist in a series, placing at the lower end of the series those of which the functions are continuous, and therefore called vegetative; at the other, those highly specialised structures, as, *e.g.*, those in the brain, which in response to physical light produce physiological, that is subjective, light; or, to take another instance, the so-called motor cells of the surface of the brain, which in response to a stimulus of much greater complexity produce voluntary motion. And just as in civilised society an individual is valued according to his power of doing one thing well, so the high rank which is assigned to the structure, or rather to the "specific energy" which it represents, belongs to it by virtue of its specialisation. And if it be asked how this conformity is manifested, the answer is, by the quality, intensity, duration, and extension of the response, in all which respects vision serves as so good an example, that we can readily understand how it happened that it was in this field that the relation between response and stimulus was first clearly recognised. I need scarcely say that, however interesting it might be to follow out the lines of inquiry thus indicated, we cannot attempt it this evening. All that I can do is to mention one or two recent observations which, while they serve as illustrations, may perhaps be sufficiently novel to interest even those who are at home in the subject.

Probably everyone is acquainted with some of the familiar proofs that an object is seen for a much longer period than it is actually exposed to view; that the visual reaction lasts much longer than its cause. More precise observations teach us that this response is regulated according to laws which it has in common with all the higher functions of an organism. If, for example, the cells in the brain of the torpedo are "let off"—that is, awakened by an external stimulus—the electrical discharge, which, as in the case of vision, follows after a certain interval, lasts a certain time, first rapidly increasing to a maximum of intensity, then more slowly diminishing. In like manner, as regards the visual apparatus, we have, in the response to a sudden invasion of the eye by light, a rise and fall of a similar character. In the case of the electrical organ, and in many analogous instances, it is easy to investigate the time relations of the successive phenomena, so as to represent them graphically. Again, it is found that in many physiological reactions, the period of rising "energy" (as Helmholtz called it) is followed by a period during which the responding structure is not only inactive, but its capacity for energising is so completely lost that the same exciting cause which a moment before "let off" the characteristic response is now without effect. As regards vision, it has long been believed that these general characteristics of physiological reaction have their counterpart in the visual process, the most striking evidence being that in the contemplation of a lightning flash—or, better, of an instantaneously illuminated white disc[*]—the eye seems to receive a double stroke, indicating that, although the stimulus is single and instantaneous, the response is reduplicated. The most precise of the methods we until lately possessed for investigating the wax and wane of the visual reaction, were not only difficult to carry out but left a large margin of uncertainty. It was therefore particularly satisfactory when M. Charpentier, of Nancy, whose merits as an investigator are perhaps less known than they deserve to be, devised an experiment of extreme simplicity which enables us, not only to observe, but to measure with great facility both phases of the reaction. It is difficult to explain even the simplest apparatus without diagrams; you will, however, understand the experiment if you will imagine that you are contemplating a disc, like those ordinarily used for colour mixing; that it is divided by two radial lines which diverge from each other at an angle of 60°; that the sector which these lines enclose is white, the rest black; that the disc revolves slowly, about once in two seconds. You then see, close to the front edge of the advancing sector, a black bar, followed by a second at the same distance from itself but much fainter. Now the scientific value of the experiment consists in this, that the angular distance of the bar from the black border is in proportion to the frequency of the revolutions—the faster the wider. If, for example, when the disc makes half a revolution in a second the distance is ten degrees, this obviously means that when light bursts into the eye, the extinction happens one-eighteenth of a second after the excitation.[†]

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* *Handb. der physiologischen Optik*, 1886, p. 233. Helmholtz uses the word in the plural—the "energies of the nerves of special sense."

The fact thus demonstrated, that the visual reaction consequent on an instantaneous illumination exhibits the alternations I have described, has enabled M. Charpentier to make out another fact in relation to the visual reaction which is, I think, of equal importance. In all the instances, excepting the retina, in which the physiological response to stimulus has a definite time-limitation, and in so far resembles an explosion—in other words, in all the higher forms of specific energy, it can be shown experimentally that the process is propagated from the part first directly acted on to other contiguous parts of similar endowment. Thus in the simplest of all known phenomena of this kind, the electrical change, by which the leaf of the Dionæa plant responds to the slightest touch of its sensitive hairs, is propagated from one side of the leaf to the other, so that in the opposite lobe the response occurs after a delay which is proportional to the distance between the spot excited and the spot observed. That in the retina there is also such propagation has not only been surmised from analogy, but inferred from certain observed facts. M. Charpentier has now been able by a method which, although simple, I must not attempt to describe, not only to prove its existence, but to measure its rate of progress over the visual field.

There is another aspect of the visual response to the stimulus of light which, if I am not trespassing too long on your patience, may, I think, be interesting to consider. As the relations between the sensations of colour and the physical properties of the light which excites them, are among the most certain and invariable in the whole range of vital reactions, it is obvious that they afford as fruitful a field for physiological investigation as those in which white light is concerned. We have on one side physical facts, that is, wave-lengths or vibration-rates; on the other, facts in consciousness—namely, sensations of colour—so simple that notwithstanding their subjective character there is no difficulty in measuring either their intensity or their duration. Between these there are *lines of influence*, neither physical nor psychological, which pass from the former to the latter through the visual apparatus (retina, nerve, brain). It is these lines of influence which interest the physiologist. The structure of the visual apparatus affords us no clues to trace them by. The most important fact we know about them is that they must be at least three in number.

It has been lately assumed by some that vision, like every other specific energy, having been developed progressively, objects were seen by the most elementary forms of eye only in chiaroscuro, that afterwards some colours were distinguished, eventually all. As regards hearing it is so. The organ which, on structural grounds, we consider to represent that of hearing in animals low in the scale of organisation—as, *e.g.*, in the Ctenophora—has nothing to do with sound,[*] but confers on its possessor the power of judging of the direction of its own movements in the water in which it swims, and of guiding these movements accordingly. In the lowest vertebrates, as, *e.g.*, in the dogfish, although the auditory apparatus is much more complicated in structure, and plainly corresponds with our own, we still find the particular part which is concerned in hearing scarcely traceable. All that is provided for is that sixth sense, which the higher animals also possess, and which enables them to judge of the direction of their own movements. But a stage higher in the vertebrate series we find the special mechanisms by which we ourselves appreciate sounds beginning to appear—not supplanting or taking the place of the imperfect organ, but added to it. As regards hearing, therefore, a new function is acquired without any transformation or fusion of the old into it. We ourselves possess the sixth sense, by which we keep our balance, and which serves as the guide to our bodily movements. It resides in the part of the internal ear which is called the labyrinth. At the same time we enjoy along with it the possession of the cochlea, that more complicated apparatus by which we are able to hear sounds and to discriminate their vibration-rates.

As regards vision, evidence of this kind is wanting. There is, so far as I know, no proof that visual organs, which are so imperfect as to be incapable of distinguishing the forms of objects, may not be affected differently by their colours. Even if it could be shown that the least perfect forms of eye possess only the power of discriminating between light and darkness, the question whether in our own such a faculty exists separately from that of distinguishing colours is one which can only be settled by experiment. As in all sensations of colour the sensation of brightness is mixed, it is obvious that one of the first points to be determined is whether the latter represents a "specific energy" or merely a certain combination of specific energies which are excited by colours. The question is not whether there is such a thing as white light, but whether we possess a separate faculty by which we judge of light and shade—a question which, although we have derived our knowledge of it chiefly from physical experiment, is one of eye and brain, not of wave-lengths or vibration-rates, and is therefore essentially physiological.

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[*] The phenomenon is best seen when, in a dark room, the light of a luminous spark is thrown on to a white screen with the aid of a suitable lens.

[†] Charpentier, 'Réaction oscillatoire de la Rétine sous l'influence des excitations lumineuses,' *Archives de Physiol.*, vol. xxiv., p. 541, and *Propagation de l'action oscillatoire*, etc., p. 862.

[*] Verworn, 'Gleichgewicht u. Otolithenorgan,' *Pflüger's Archiv*, vol. l., p. 423; also Ewald's 'Researches on the Labyrinth as a Sense-Organ' (*Ueber das Endorgan des Nervus octavus*, Wiesbaden, 1892).

There is a German proverb which says, "Bei Nacht sind alle Katzen grau." The fact which this proverb expresses presents itself experimentally when a spectrum projected on a white surface is watched, while the intensity of the light is gradually diminished. As the colours fade away they become indistinguishable as such, the last seen being the primary red and green. Finally they also disappear, but a grey band of light still remains, of which the most luminous part is that which before was green.[*] Without entering into details, let us consider what this tells us of the specific energy of the visual apparatus. Whether or not the faculty by which we see grey in the dark is one which we possess in common with animals of imperfectly developed vision, there seems little doubt that there are individuals of our own species who, in the fullest sense of the expression, have no eye for colour; in whom all colour sense is absent; persons who inhabit a world of grey, seeing all things as they might have done had they and their ancestors always lived nocturnal lives. In the theory of colour vision, as it is commonly stated, no reference is made to such a faculty as we are now discussing.

Professor Hering, whose observations as to the diminished spectrum I referred to just now, who was among the first to subject the vision of the *totally* colour-blind to accurate examination, is of opinion, on that and on other grounds, that the sensation of light and shade is a specific faculty. Very recently the same view has been advocated on a wide basis by a distinguished psychologist, Professor Ebbinghaus.[†] Happily, as regards the actual experimental results relating to both these main subjects, there seems to be a complete coincidence of observation between observers who interpret them differently. Thus the recent elaborate investigations of Captain Abney[‡] (with General Festing), representing graphically the results of his measurements of the subjective values of the different parts of the diminished spectrum, as well as those of the fully illuminated spectrum as seen by the totally colour-blind, are in the closest accord with the observations of Hering, and have, moreover, been substantially confirmed in both points by the measurements of Dr. König in Helmholtz' laboratory at Berlin.[§] That observers of such eminence as the three persons whom I have mentioned, employing different methods and with a different purpose in view, and without reference to each other's work, should arrive in so complicated an inquiry at coincident results, augurs well for the speedy settlement of this long-debated question. At present the inference seems to be that such a specific energy as Hering's theory of vision postulates actually exists, and that it has for associates the colour-perceiving activities of the visual apparatus, provided that these are present; but that whenever the intensity of the illumination is below the chromatic threshold—that is, too feeble to awaken these activities—or when, as in the totally colour-blind, they are wanting, it manifests itself independently; all of which can be most easily understood on such a hypothesis as has lately been suggested in an ingenious paper by Mrs. Ladd Franklin,[*] that each of the elements of the visual apparatus is made up of a central structure for the sensation of light and darkness, with collateral appendages for the sensations of colour—it being, of course, understood that this is a mere diagrammatic representation, which serves no purposes beyond that of facilitating the conception of the relation between the several "specific energies."

### EXPERIMENTAL PSYCHOLOGY.

Resisting the temptation to pursue this subject further, I will now ask you to follow me into a region which, although closely connected with the subjects we have been considering, is beset with greater difficulties—the subject in which, under the name of Physiological or Experimental Psychology, physiologists and psychologists have of late years taken a common interest—a borderland not between fact and fancy, but between two methods of investigation of questions which are closely related, which here, though they do not overlap, at least interdigitate. It is manifest that, quite irrespectively of any foregone conclusion as to the dependence of mind on processes of which the biologist is accustomed to take cognisance, mind must be regarded as one of the "specific energies" of the organism, and should on that ground be included in the subject-matter of physiology. As, however, our science, like other sciences, is limited not merely by its subject but also by its method, it actually takes in only so much of psychology as is experimental. Thus sensation, although it is psychological, and the investigation of its relation to the special structures by which the mind keeps itself informed of what goes on in the outside world, have always been considered to be in the physiological sphere. And it is by anatomical researches relating to the minute structure and to the development of the brain, by observation of the facts of disease, and, above all, by physiological experiment, that those changes in the ganglion cells of the brain and spinal cord which are the immediate antecedents of every kind of bodily action have been traced. Between the two—that is, between sensation and the beginning of action—there is an intervening region which the physiologist has hitherto willingly resigned to psychology, feeling his incompetence to use the only instrument by which it can be explored—that of introspection. This consideration enables us to understand the course which the new study (I will not claim for it the title of a new science, regarding it as merely a part of the great science of life) has hitherto followed, and why physiologists have been unwilling to enter on it. The study of the less complicated internal relations of the organism has afforded so many difficult problems that the most difficult of all have been deferred; so that although the psycho-physical method was initiated by E. H. Weber in the middle of the present century, by investigations[†] which formed part of the work done at that epoch of discovery, and although Professor Wundt, also a physiologist, has taken a larger share in the more recent development of the new study, it is chiefly by psychologists that the researches which have given to it its importance as a new discipline have been conducted.

Although, therefore, experimental psychology has derived its methods from physical science, the result has been not so much that physiologists have become philosophers, as that philosophers have become experimental psychologists. In our own universities, in those of America, and still more in those of Germany, psychological students of mature age are to be found who are willing to place themselves in the dissecting-room side by side with beginners in anatomy, in order to acquire that exact knowledge of the framework of the organism without which no man can understand its working. Those, therefore, who are apprehensive lest the regions of mind should be invaded by the *insaniens sapientia* of the laboratory, may, I think, console themselves with the thought that the invaders are for the most part men who before they became laboratory workers had already given their allegiance to philosophy; their purpose being not to relinquish definitively, but merely to lay aside for a time, the weapons in the use of which they had been trained, in order to learn the use of ours. The motive that has encouraged them has not been any hope of finding an experimental solution of any of the ultimate problems of philosophy, but the conviction that, inasmuch as the relation between mental stimuli and the mental processes which they awaken is of the same order with the relation between every other vital process and its specific determinant, the only hope of ascertaining its nature must lie in the employment of the same methods of comparative measurement which the biologist uses for similar purposes. Not that there is necessarily anything scientific in mere measurement, but that measurement affords the only means by which it can be determined whether or not the same conformity in the relation between stimulus and reaction which we have accepted as the fundamental characteristic of life, is also to be found in mind, notwithstanding that mental processes have no known physical concomitants. The results of experimental psychology tend to show that it is so, and consequently that in so far the processes in question are as truly functions of organism as the contraction of a muscle, or as the changes produced in the retinal pigment by light.

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[*] Hering, 'Untersuch. eines total Farbenblinden,' *Pflüger's Arch.*, vol. xlix., 1891, p. 563.

[†] Ebbinghaus, 'Theorie des Farbensehens,' *Zeitschr. f. Psychol.*, vol. v., 1893, p. 145.

[‡] Abney and Festing, Colour Photometry, Part III. *Phil. Trans.*, vol. clxxxiii., A, 1891, p. 531.

[§] König, 'Ueber den Helligkeitwerth der Spectralfarben bei verschiedener absoluter Intensität,' *Beiträge zur Psychologie*, etc., 'Festschrift zu H. von Helmholtz, 70, Geburtstage,' 1891, p. 309.

[*] Christine Ladd Franklin, 'Eine neue Theorie der Lichtempfindungen,' *Zeitschr. für Psychologie*, vol. iv., 1893, p. 211; see also the Proceedings of the last Psychological Congress in London, 1892.

[†] Weber's researches were published in Wagner's *Handwörterbuch*, I think, in 1849.

I will make no attempt even to enumerate the special lines of inquiry which during the last decade have been conducted with such vigour in all parts of the world, all of them traceable to the influence of the Leipzig school; but will content myself with saying that the general purpose of these investigations has been to determine with the utmost attainable precision the nature of psychical relations. Some of these investigations begin with those simpler reactions which more or less resemble those of an automatic mechanism, proceeding to those in which the resulting action or movement is modified by the influence of auxiliary or antagonistic conditions, or changed by the simultaneous or antecedent action on the reagent of other stimuli, in all of which cases the effect can be expressed quantitatively; others lead to results which do not so readily admit of measurement. In pursuing this course of inquiry the physiologist finds himself as he proceeds more and more the *coadjutor* of the pyschologist, less and less his *director*; for whatever advantage the former may have in the mere *technique* of observation, the things with which he has to do are revealed only to introspection, and can be studied only by methods which lie outside of his sphere. I might in illustration of this refer to many recent experimental researches—such, for example, as those by which it has been sought to obtain exact data as to the physiological concomitants of pleasure and of pain, or as to the influence of weariness and recuperation, as modifiers of psychological reactions. Another outwork of the mental citadel which has been invaded by the experimental method is that of memory. Even here it can be shown that in the comparison of transitory as compared with permanent memory—as, for example, in the getting off by heart of a wholly uninteresting series of words, with subsequent oblivion and reacquisition—the labour of acquiring and reacquiring may be measured, and consequently the relation between them; and that this ratio varies according to a simple numerical law.

I think it not unlikely that the only effect of what I have said may be to suggest to some of my hearers the question, What is the use of such inquiries? Experimental psychology has, to the best of my knowledge, no technical application. The only satisfactory answer I can give is that it has exercised, and will exercise in future, a helpful influence on the science of life. Every science of observation, and each branch of it, derives from the peculiarities of its methods certain tendencies which are apt to predominate unduly. We speak of this as specialisation, and are constantly striving to resist its influence. The most successful way of doing so is by availing ourselves of the counteracting influence which two opposite tendencies mutually exercise when they are simultaneous. He that is skilled in the methods of introspection naturally (if I may be permitted to say so) looks at the same thing from an opposite point of view to that of the experimentalist. It is, therefore, good that the two should so work together that the tendency of the experimentalist to imagine the existence of mechanism where none is proved to exist—of the psychologist to approach the phenomena of mind too exclusively from the subjective side—may mutually correct and assist each other.

### PHOTOTAXIS AND CHEMIOTAXIS.

Considering that every organism must have sprung from a unicellular ancestor, some have thought that unless we are prepared to admit a deferred epigenesis of mind, we must look for psychical manifestations even among the lowest animals, and that as in the protozoon all the vital activities are blended together, mind should be present among them not merely potentially but actually, though in diminished degree.

Such a hypothesis involves ultimate questions which it is unnecessary to enter upon: it will, however, be of interest in connection with our present subject to discuss the phenomena which served as a basis for it—those which relate to what may be termed the behaviour of unicellular organisms and of individual cells, in so far as these last are capable of reacting to external influences. The observations which afford us most information are those in which the stimuli employed can be easily measured, such as electrical currents, light, or chemical agents in solution.

A single instance, or at most two, must suffice to illustrate the influence of light in directing the movements of freely moving cells, or, as it is termed, phototaxis. The rod-like purple organism called by Engelmann *Bacterium photometricum*,[*] is such a light-lover that if you place a drop of water containing these organisms under the microscope, and focus the smallest possible beam of light on a particular spot in the field, the spot acts as a light trap and becomes so crowded with the little rodlets as to acquire a deep port-wine colour. If instead of making his trap of white light, he projected on the field a microscopic spectrum, Engelmann found that the rodlets showed their preference for a spectral colour, which is absorbed when transmitted through their bodies. By the aid of a light trap of the same kind, the very well-known spindle-shaped and flagellate cell of Euglena can be shown to have a similar power of discriminating colour, but its preference is different. This familiar organism advances with its flagellum forwards, the sharp end of the spindle having a red or orange eye point. Accordingly, the light it loves is again that which is most absorbed—viz., the blue of the spectrum (line F).

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[*] Engelmann, 'Bacterium photometricum,' *Onderzoek. Physiol. Lab. Utrecht*, vol. vii., p. 200; also Ueber Licht- u. Farbenperception niederster Organismen, *Pflüger's Arch.*, vol. xxix., p. 387.

These examples may serve as an introduction to a similar one in which the directing cause of movement is not physical but chemical. The spectral light trap is used in the way already described; the organisms to be observed are not coloured, but bacteria of that common sort which twenty years ago we used to call *Bacterium termo*, and which is recognised as the ordinary determining cause of putrefaction. These organisms do not care for light, but are great oxygen-lovers. Consequently, if you illuminate with your spectrum a filament of a confervoid alga, placed in water containing bacteria, the assimilation of carbon and consequent disengagement of oxygen is most active in the part of the filament which receives the red rays (B to C). To this part, therefore, where there is a dark band of absorption, the bacteria which want oxygen are attracted in crowds. The motive which brings them together is their desire for oxygen. Let us compare other instances in which the source of attraction is food.

The plasmodia of the myxomycetes, particularly one which has been recently investigated by Mr. Arthur Lister,[*] may be taken as a typical instance of what may be called the chemical allurement of living protoplasm. In this organism, which in the active state is an expansion of labile living material, the delicacy of the reaction is comparable to that of the sense of smell in those animals in which the olfactory organs are adapted to an aquatic life. Just as, for example, the dogfish is attracted by food which it cannot see, so the plasmodium of Badhamia becomes aware, as if it smelled it, of the presence of its food—a particular kind of fungus. I have no diagram to explain this, but will ask you to imagine an expansion of living material, quite structureless, spreading itself along a wet surface; that this expansion of transparent material is bounded by an irregular coast-line; and that somewhere near the coast there has been placed a fragment of the material on which the Badhamia feeds. The presence of this bit of *Stereum* produces an excitement at the part of the plasmodium next to it. Towards this centre of activity streams of living material converge. Soon the afflux leads to an outgrowth of the plasmodium, which in a few minutes advances towards the desired fragment, envelopes, and incorporates it.

May I give you another example also derived from the physiology of plants? Very shortly after the publication of Engelmann's observations of the attraction of bacteria by oxygen, Pfeffer made the remarkable discovery that the movements of the antherozoids of ferns and of mosses are guided by impressions derived from chemical sources, by the allurement exercised upon them by certain chemical substances in solution—in one of the instances mentioned by sugar, in the other by an organic acid. The method consisted in introducing the substance to be tested, in any required strength, into a minute capillary tube closed at one end, and placing it under the microscope in water inhabited by antherozoids, which thereupon showed their predilection for the substance, or the contrary, by its effect on their movements. In accordance with the principle followed in experimental psychology, Pfeffer[†] made it his object to determine, not the relative effects of different doses, but the smallest perceptible increase of dose which the organism was able to detect, with this result—that, just as in measurements of the relation between stimulus and reaction in ourselves we find that the sensational value of a stimulus depends, not on its absolute intensity, but on the ratio between that intensity and the previous excitation, so in this simplest of vital reagents the same so-called psycho-physical law manifests itself. It is not, however, with a view to this interesting relation that I have referred to Pfeffer's discovery, but because it serves as a centre around which other phenomena, observed alike in plants and animals, have been grouped. As a general designation of reactions of this kind Pfeffer devised the term Chemotaxis, or, as we in England prefer to call it, Chemiotaxis. Pfeffer's contrivance for chemiotactic testing was borrowed from the pathologists, who have long used it for the purpose of determining the relation between a great variety of chemical compounds or products, and the colourless corpuscles of the blood. I need, I am sure, make no apology for referring to a question which, although purely pathological, is of very great biological interest—the theory of the process by which, not only in man, but also, as Metschnikoff has strikingly shown, in animals far down in the scale of development, the organism protects itself against such harmful things as, whether particulate or not, are able to penetrate its framework. Since Cohnheim's great discovery in 1867 we have known that the central phenomenon of what is termed by pathologists *inflammation* is what would now be called a chemiotactic one; for it consists in the gathering together, like that of vultures to a carcase, of those migratory cells which have their home in the blood stream and in the lymphatic system, to any point where the living tissue of the body has been injured or damaged, as if the products of disintegration which are set free where such damage occurs were attractive to them.

The fact of chemiotaxis, therefore, as a constituent phenomenon of the process of inflammation, was familiar in pathology long before it was understood. Cohnheim himself attributed it to changes in the channels along which the cells moved, and this explanation was generally accepted, though some writers, at all events, recognised its incompleteness. But no sooner was Pfeffer's discovery known than Leber,[*] who for years had been working at the subject from the pathological side, at once saw that the two processes were of similar nature. Then followed a variety of researches of great interest, by which the importance of chemiotaxis in relation to the destruction of disease-producing microphytes was proved, by that of Buchner[†] on the chemical excitability of leucocytes being among the most important. Much discussion has taken place, as many present are aware, as to the kind of wandering cells, or leucocytes, which in the first instance attack morbific microbes, and how they deal with them. The question is not by any means decided. It has, however, I venture to think, been conclusively shown that the process of destruction is a chemical one, that the destructive agent has its source in the chemiotactic cells—that is, cells which act under the orders of chemical stimuli. Two Cambridge observers, Messrs. Kanthack and Hardy,[‡] have lately shown that, in the particular instance which they have investigated, the cells which are most directly concerned in the destruction of morbific *bacilli*, although chemiotactic, do not possess the power of incorporating either bacilli or particles of any other kind. While, therefore, we must regard the relation between the process of devitalising and that of incorporating as not yet sufficiently determined, it is now no longer possible to regard the latter as essential to the former.

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[*] Lister, 'On the Plasmodium of *Badhamia utricularis*, etc.,' *Annals of Botany*, No. 5, June, 1888.

[†] Pfeffer, *Untersuch a. d. botan. Insitute z. Tübingen*, vol. i., part 3, 1884.

[*] Leber, 'Die Anhäufung der Leucocyten am Orte des Entzündungsreizes,' etc. *Die Entstehung der Entzündung*, etc., pp. 423-464, Leipzig, 1891.

[†] Buchner, 'Die chem. Reizbarkeit der Leucocyten,' etc., *Berliner klin. Woch.*, 1890, No. 17.

[‡] Kanthack and Hardy, 'On the Characters and Behaviour of the Wandering Cells of the Frog,' *Proceedings of the Royal Society*, vol. lii., p. 267.

There seems, therefore, to be very little doubt that chemiotactic cells are among the agents by which the human or animal organism protects itself against infection. There are, however, many questions connected with this action which have not yet been answered. The first of these are chemical ones—that of the nature of the attractive substance, and that of the process by which the living carriers of infection are destroyed. Another point to be determined is how far the process admits of adaptation to the particular infection which is present in each case, and to the state of liability or immunity of the infected individual. The subject is therefore of great complication. None of the points I have suggested can be settled by experiments in glass tubes such as I have described to you. These serve only as indications of the course to be followed in much more complicated and difficult investigations—when we have to do with acute diseases as they actually affect ourselves or animals of similar liabilities to ourselves, and find ourselves face to face with the question of their causes.

It is possible that many members of the Association are not aware of the unfavourable—I will not say discreditable—position that this country at present occupies in relation to the scientific study of this great subject—the causes and mode of prevention of infectious diseases. As regards administrative efficiency in matters relating to public health, England was at one time far ahead of all other countries, and still retains its superiority; but as regards scientific knowledge we are, in this subject as in others, content to borrow from our neighbours. Those who desire either to learn the methods of research or to carry out scientific inquiries have to go to Berlin, to Munich, to Breslau, or to the Pasteur Institute in Paris, to obtain what England ought long ago to have provided. For to us, from the spread of our race all over the world, the prevention of acute infectious diseases is more important than to any other nation. At the beginning of this address I urged the claims of pure science. If I could, I should feel inclined to speak even more strongly of the application of science to the discovery of the causes of acute diseases. May I express the hope that the effort which is now being made to establish in England an institution for this purpose not inferior in efficiency to those of other countries, may have the sympathy of all present? And now may I ask your attention for a few moments more to the subject that more immediately concerns us?

### CONCLUSION.

The purpose which I have had in view has been to show that there is one principle—that of adaptation—which separates biology from the exact sciences, and that in the vast field of biological inquiry the end we have is not merely, as in natural philosophy, to investigate the relation between a phenomenon and the antecedent and concomitant conditions on which it depends, but to possess this knowledge in constant reference to the interest of the organism. It may perhaps be thought that this way of putting it is too teleological, and that in taking, as it were, as my text this evening so old-fashioned a biologist as Treviranus, I am yielding to a retrogressive tendency. It is not so. What I have desired to insist on is that *organism* is a fact which encounters the biologist at every step in his investigations; that in referring it to any general biological principle, such as adaptation, we are only referring it to itself, not explaining it; that no explanation will be attainable until the conditions of its coming into existence can be subjected to experimental investigation so as to correlate them with those of processes in the non-living world.

Those who were present at the meeting of the British Association at Liverpool will remember that then, as well as at some subsequent meetings, the question whether the conditions necessary for such an inquiry could be realised was a burning one. This is no longer the case. The patient endeavours which were made about that time to obtain experimental proof of what was called *abiogenesis*, although they conduced materially to that better knowledge which we now possess of the conditions of life of bacteria, failed in the accomplishment of their purpose. The question still remains undetermined; it has, so to speak, been adjourned *sine die*. The only approach to it lies at present in the investigation of those rare instances in which, although the relations between a living organism and its environment ceases as a watch stops when it has not been wound, these relations can be re-established—the process of life re-awakened—by the application of the required stimulus.

I was also desirous to illustrate the relation between physiology and its two neighbours on either side, natural philosophy (including chemistry) and psychology. As regards the latter, I need add nothing to what has already been said. As regards the former, it may be well to notice that although physiology can never become a mere branch of applied physics or chemistry, there are parts of physiology wherein the principles of these sciences may be applied directly. Thus, in the beginning of the century, Young applied his investigations as to the movements of liquids in a system of elastic tubes, directly to the phenomena of the circulation; and a century before, Borelli successfully examined the mechanisms of locomotion and the action of muscles, without reference to any, excepting mechanical principles. Similarly, the foundation of our present knowledge of the process of nutrition was laid in the researches of Bidder and Schmidt, in 1851, by determinations of the weight and composition of the body, the daily gain of weight by food or oxygen, the daily loss by the respiratory and other discharges, all of which could be accomplished by chemical means. But in by far the greater number of physiological investigations, both methods (the physical or chemical and the physiological) must be brought to bear on the same question—to co-operate for the elucidation of the same problem. In the researches, for example, which during several years have occupied Professor Bohr, of Copenhagen, relating to the exchange of gases in respiration, he has shown that factors purely physical—namely, the partial pressures of oxygen and carbon dioxide in the blood which flows through the pulmonary capillaries—are, so to speak, interfered with in their action by the "specific energy" of the pulmonary tissue, in such a way as to render this fundamental process, which, since Lavoisier, has justly been regarded as one of the most important in physiology, much more complicated than we for a long time supposed it to be. In like manner Heidenhain has proved that the process of lymphatic absorption, which before we regarded as dependent on purely mechanical causes—*i.e.*, differences of pressure—is in great measure due to the specific energy of cells, and that in various processes of secretion the principal part is not, as we were inclined not many years ago to believe, attributable to liquid diffusion, but to the same agency. I wish that there had been time to have told you something of the discoveries which have been made in this particular field by Mr. Langley, who has made the subject of "specific energy" of secreting-cells his own. It is in investigations of this kind, of which any number of examples could be given, in which vital reactions mix themselves up with physical and chemical ones so intimately that it is difficult to draw the line between them, that the physiologist derives most aid from whatever chemical and physical training he may be fortunate enough to possess.

There is, therefore, no doubt as to the advantages which physiology derives from the exact sciences. It could scarcely be averred that they would benefit in anything like the same degree from closer association with the science of life. Nevertheless, there are some points in respect of which that science may have usefully contributed to the advancement of physics or of chemistry. The discovery of Graham as to the characters of colloid substances, and as to the diffusion of bodies in solution through membranes, would never have been made had not Graham "ploughed," so to speak, "with our heifer." The relations of certain colouring matters to oxygen and carbon dioxide would have been unknown, had no experiments been made on the respiration of animals and the assimilative process in plants; and, similarly, the vast amount of knowledge which relates to the chemical action of ferments must be claimed as of physiological origin. So also there are methods, both physical and chemical, which were originally devised for physiological purposes. Thus the method by which meteorological phenomena are continuously recorded graphically, originated from that used by Ludwig (1847) in his 'Researches on the Circulation'; the mercurial pump, invented by Lothar Meyer, was perfected in the physiological laboratories of Bonn and Leipzig; the rendering the galvanometer needle aperiodic by damping was first realised by du Bois-Reymond—in all of which cases invention was prompted by the requirements of physiological research.

Let me conclude with one more instance of a different kind, which may serve to show how, perhaps, the wonderful ingenuity of contrivance which is displayed in certain organised structures—the eye, the ear, or the organ of voice—may be of no less interest to the physicist than to the physiologist. Johannes Müller, as is well known, explained the compound eye of insects on the theory that an erect picture is formed on the convex retina by the combination of pencils of light, received from different parts of the visual field through the eyelets (ommatidia) directed to them. Years afterwards it was shown that in each eyelet an image is formed which is reversed. Consequently, the mosaic theory of Müller was for a long period discredited on the ground that an erect picture could not be made up of "upside-down" images. Lately the subject has been reinvestigated, with the result that the mosaic theory has regained its authority. Professor Exner* has proved photographically that behind each part of the insect's eye an erect picture is formed of the objects towards which it is directed. There is, therefore, no longer any difficulty in understanding how the whole field of vision is mapped out as consistently as it is imaged on our own retina, with the difference, of course, that the picture is erect. But behind this fact lies a physical question—that of the relation between the erect picture which is photographed and the optical structure of the crystal cones which produce it—a question which, although we cannot now enter upon it, is quite as interesting as the physiological one.

With this history of a theory which, after having been for thirty years disbelieved, has been reinstated by the fortunate combination of methods derived from the two sciences, I will conclude. It may serve to show how, though physiology can never become a part of natural philosophy, the questions we have to deal with are cognate. Without forgetting that every phenomenon has to be regarded with reference to its useful purpose in the organism, the aim of the physiologist is not to inquire into final causes, but to investigate processes. His question is ever How, rather than Why.

May I illustrate this by a simple, perhaps too trivial, story, which derives its interest from its having been told of the childhood of one of the greatest natural philosophers of the present century?† He was even then possessed by that insatiable curiosity which is the first quality of the investigator; and it is related of him that his habitual question was "What is the *go* of it?" and if the answer was unsatisfactory, "What is the particular go of it?" That North Country boy became Professor Clerk Maxwell. The questions he asked are those which in our various ways we are all trying to answer.

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## ADDRESS TO THE CHEMICAL SECTION.

BY PROFESSOR EMERSON REYNOLDS, M.D., SC.D., F.R.S., PRESIDENT OF THE SECTION.

At the Nottingham meeting of the British Association in 1866, Dr. H. Bence Jones addressed the Section over which I have now the honour to preside on the place of Chemical Science in Medical Education. Without dwelling on this topic to-day, it is an agreeable duty to acknowledge the foresight of my predecessor as to the direction of medical progress. Twenty-seven years ago the methods of inquiry and instruction in medicine were essentially based on the formal lines of the last generation. Dr. Bence Jones saw that modern methods of research in chemistry—and in the experimental sciences generally—must profoundly influence medicine, and he urged the need of fuller training of medical students in those sciences.

The anticipated influence is now operative as a powerful factor in the general progress of medicine and medical education; but much remains to be desired in regard to the chemical portion of that education. In the later stages of it, undue importance is still attached to the knowledge of substances rather than of principles; of products instead of the broad characters of the chemical changes in which they are formed. Without this higher class of instruction it is unreasonable to expect an intelligent perception of complex physiological and pathological processes which are chemical in character, or much real appreciation of modern pharmacological research. I have little doubt, however, that the need for this fuller chemical education will soon be so strongly felt that the necessary reform will come from within a profession which has given ample proof in recent years of its zeal in the cause of scientific progress.

In our own branch of science the work of the year has been substantial in character, if almost unmarked by discoveries of popular interest. We may probably place in the latter category the measure of success which the skill of Moissan has enabled him to attain in the artificial production of the diamond form of carbon, apparently in minute crystals similar to those recognised by Koenig, Mallard, Daubrée, and by Friedel in the supposed meteorite of Cañon de Diablo in Arizona. Members of the Section will probably have the opportunity of examining some of these artificial diamonds through the courtesy of M. Moissan, who has also, at my request, been so good as to arrange for us a demonstration of the properties of the element fluorine, which he succeeded in isolating in 1887.

Not less interesting or valuable are the studies of Dr. Perkins, on electro-magnetic rotation; of Lord Rayleigh, on the relative densities of gases; of Dewar, on chemical relations at extremely low temperatures; of Clowes, on exact measurements of flame-cap indications afforded by miners' testing lamps; of Horace Brown and Morris, on the chemistry and physiology of foliage leaves, by which they have been led to the startling conclusion that cane-sugar is the first sugar produced during the assimilation of carbon, and that starch is formed at its expense as a more stable reserve material for subsequent use of the plant; or of Cross, Bevan, and Beadle, on the interaction of alkali-cellulose and carbon bisulphide, in the course of which they have proved that a cellulose residue can act like an alcohol radical in the formation of thio-carbonates, and thus have added another to the author's valuable contributions to our knowledge of members of the complex group of celluloses.

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* Exner, *Die Physiologie der facettirten Augen von Krebsen u. Insecten*, Leipzig, 1891.

* *Life of Clerk Maxwell* (Campbell and Garnett), p. 28.

But it is now an idle task for a President of this Section to attempt a slight sketch of the works of chemical philosophers even during the short space of twelve months; they are too numerous and generally too important to be lightly treated, hence we can but apply to them a paraphrase of the ancient formula—Are they not written in the books of the chronicles we term "Jahresberichte," "Annales," or "Transactions and Abstracts," according to our nationality?

I would, however, in this connection ask your consideration for a question relating to the utilisation of the vast stores of facts laid up—some might even say buried—in the records to which reference has just been made. The need exists, and almost daily becomes greater, for facile reference to this accumulated wealth, and of such a kind that an investigator, commencing a line of inquiry with whose previous history he is not familiar, can be certain to learn *all* the facts known on the subject up to a particular date, instead of having only the partial record to be found in even the best edited of the dictionaries now available. The best and most obvious method of attaining this end is the publication of a subject-matter index of an ideally complete character. I am glad to know that the Chemical Society of London will probably provide us in the years to come with a compilation which will doubtless aim at a high standard of value as a work of reference to memoirs, and in some degree to their contents, so far as the existing indexes of the volumes of the Society's Journal supply the information. Whether this subject-matter index is published or not, the time has certainly arrived for adopting the immediately useful course of publishing monographs, analagous to those now usual in Natural Science, which shall contain all the information gained up to a particular date in the branch of chemistry with which the author is specially familiar by reason of his own work in the subject. Such monographs should include much more than any mere compilation, and would form the best material from which a complete subject-matter index might ultimately be evolved.

My attention was forcibly drawn to the need of such special records by noting the comparatively numerous cases of re-discovery and imperfect identification of derivatives of thiourea. In my laboratory, where this substance was isolated, we naturally follow with interest all work connected with it, and therefore readily detect lapses of the kind just mentioned. But when it is remembered that the distinct derivatives of thiourea now known number considerably over six hundred substances, and that their descriptions are scattered through numerous British and foreign journals, considerable excuse can be found for workers overlooking former results. The difficulty which exists in this one small department of the science I hope shortly to remove, and trust that others may be induced to provide similar works of reference to the particular branches of chemistry with which they are personally most familiar.

When we consider the drift of investigation in recent years, it is easy to recognise a distinct reaction from extreme specialisation in the prominence now given to general physico-chemical problems, and to those broad questions concerning the relations of the elements which I would venture to group under the head of "Comparative Chemistry." Together these lines of inquiry afford promise of definite information about the real nature of the seventy or more entities we term "elements," and about the mechanism of that mysterious yet definite change in matter which we call "chemical action." Now and again one or other class of investigation enables us to get some glimpse beyond the known which stimulates the imaginative faculty.

For example, a curious side-light seems to be thrown on the nature of the elements by the chemico-physical discussion of the connection existing between the constitution of certain organic compounds and the colours they exhibit. Without attempting to intervene in the interesting controversy in which Armstrong and Hartly are engaged as to the nature of the connection, we may take it as an established fact that a relation exists between the power which a dissolved chemical compound possesses of producing the colour impression within our comparatively small visual range, and the particular mode of grouping of its constituent radicals in its molecule. Further, the reality of this connection will be most freely admitted in the class of aromatic compounds; that is, in derivatives of benzene, whose constituents are so closely linked together as to exhibit quasi-elemental persistence. If then, the possession of what we call colour by a compound be connected with its constitution, may we not infer that "elements" which exhibit distinct colour, such as gold and copper, in thin layers and in their soluble compounds, are at least complexes analogous to definitely decomposable substances? This inference, while legitimate as it stands, would obviously acquire strength if we could show that anything like isomerism exists among the elements; for identity of atomic weight of any two chemically distinct elements must, by all analogy with compounds, imply dissimilarity in constitution, and, therefore, definite structure, independently of any argument derived from colour. Now, nickel and cobalt are perfectly distinct elements, as we all know, but, so far as existing evidence goes, the observed differences in their atomic weights (nickel 58·6, cobalt 58·7) are so small as to be within the range of the experimental errors to which the determinations were liable. Here, then, we seem to have the required example of something like isomerism among elements, and consequently some evidence that these substances are complexes of different orders; but in the cases of cobalt and nickel we also know that in transparent solutions of their salts, if not in thin layers of the metals themselves, they exhibit strong and distinct colours—compare the beautiful rosy tint of cobalt sulphate with the brilliant green of the corresponding salt of nickel. Therefore, in exhibiting characteristically different colours, these substances afford us some further evidence of structural differences between the matter of which they consist, and support the conclusion to which their apparent identity in atomic weight would lead us. By means of such side-lights we may gradually acquire some idea of the nature of the elements, even if we are unable to get any clue to their origin other than such as may be found in Crookes' interesting speculations.

Again, while our knowledge of the genesis of the chemical elements is as small as astronomers possess of the origin of the heavenly bodies, much suggestive work has recently been accomplished in the attempt to apply the principle of gravitation, which simply explains the relative motions of the planets, to account for the interactions of the molecules of the elements. The first step in this direction was suggested by Mendeleef in his Royal Institution lecture (May 31, 1889), wherein he proposed to apply Newton's third law of motion to chemical molecules, regarded as systems of atoms analagous to double stars. The Rev. Dr. Haughton has followed up this idea with his well-known mathematical skill, and, in a series of papers just published, has shown that the three Newtonian laws are applicable to explain the interactions of chemical molecules, "with this difference, that whereas the specific coefficient of gravity is the same for all bodies, independent of the particular kind of matter of which they are composed, the atoms have specific coefficients of attraction which vary with the nature of the atoms concerned." The laws of gravitation, with this proviso, were found to apply to all the definite cases examined, and it was shown that a chemical change of combination is equivalent to a planetary catastrophe. So far the fundamental hypothesis of 'Newtonian Chemistry' has led to conclusions which are not at variance with the facts of the science, while it gives promise of help in obtaining a solution of the great problem of the nature of chemical action.

Passing from considerations of the kind to which I have just referred, permit me to occupy the rest of the time at my disposal with a short account of a line of study in what I have already termed "comparative chemistry," which is not only of inherent interest, but seems to give us the means of filling in some details of a hitherto rather neglected chapter in the early chemical history of this earth.

The most remarkable outcome of "comparative chemistry" is the periodic law of the elements, which asserts that the properties of the elements are connected in the form of a periodic function with the masses of their atoms. Concurrently with the recognition of this principle, other investigations have been in progress, aiming at more exact definitions of the characters of the relations of the elements, and ultimately of their respective offices in nature. Among inquiries of this kind the comparative study of the elements carbon and silicon appears to me to possess the highest interest. Carbon, whether combined with hydrogen, oxygen, or nitrogen, or with all three, is the great element of organic nature, while silicon, in union with oxygen and various metals, not only forms about one-third of the solid crust of the earth, but is unquestionably the most important element of inorganic nature. The chief functions of carbon are those which are performed at comparatively low temperatures; hence carbon is essentially the element of the present epoch. On the other hand, the activities of silicon are most marked at very high temperatures; hence it is the element whose chief work in nature was performed in the distant past, when the temperature of this earth was far beyond that at which the carbon compounds of organic life could exist. Yet between these dominant elements of widely different epochs remarkably close analogies are traceable, and the characteristic differences observed in their relations with other elements are just those which enable each to play its part effectively under the conditions which promote its greatest activity.

The chemical analogies of the two tetrad elements carbon and silicon are most easily recognised in compounds which either do not contain oxygen, or which are oxygen compounds of a very simple order, and the following table will recall a few of the most important of these, as well as some which have resulted from the fine researches of Friedel, Crafts, and Ladenburg:—

*Some Silicon Analogues of Carbon Compounds.*

| | | |
|---|---|---|
| $SiH_4$ | hydrides | $CH_4$ |
| $SiCl_4$ | chlorides | $CCl_4$ |
| $Si_2Cl_6$ | | $C_2Cl_6$ |
| $SiO_2$ | oxides | $CO_2$ |
| $H_2SiO_3$ | meta acids | $H_2CO_3$ |
| $HSiHO_2$ | formic acids. | $HCHO_2$ |
| $(SiHO)_2O$ | formic anhydrides | $(CHO)_2O$? |
| $H_2Si_2O_4$ | oxalic acids | $H_2C_2O_4$ |
| $HSi(CH_3)O_2$ | acetic acids | $HC(CH_3)O_2$ |
| $HSi(C_6H_5)O_2$ | benzoic acids | $HC(C_6H_5)O_2$ |
| $SiC_8H_{19}H$ | nonyl hydrides | $C_9H_{19}H$ |
| $SiC_8H_{19}OH$ | nonyl alcohols | $C_9H_{19}OH$ |

But these silicon analogues of carbon compounds are, generally, very different from the latter in reactive power, especially in presence of oxygen and water. For example, hydride of silicon, even when pure, is very easily decomposed, and, if slightly warmed, is spontaneously inflammable in air; whereas the analogous marsh gas does not take fire in air below a red heat. Again, the chlorides of silicon are rapidly attacked by water affording silicon hydroxides and hydrochloric acid; but the analogous carbon chlorides are little affected by water even at comparatively high temperatures. Similarly, silicon-chloroform and water quickly produce silico-formic acid and anhydride along with hydrochloric acid, while ordinary chloroform can be kept in contact with water for a considerable time without material change.

Until recently no well-defined compounds of silicon were known including nitrogen; but we are now acquainted with a number of significant substances of this class.

Chemists have long been familiar with the fact that a violent reaction takes place when silicon chloride and ammonia are allowed to interact. Persoz, in 1830, assumed that the resulting white powder was an addition compound, and assigned to it the formula $SiCl_4, 6NH_3$, while Besson, as lately as 1892, gave $SiCl_4, 5NH_3$. These formulæ only express the proportions in which ammonia reacts with the chloride under different conditions, and give us no information as to the real nature of the product; hence they are almost useless. Other chemists, have, however, carefully examined the product of this reaction, but owing to peculiar difficulties in the way, have not obtained results of a very conclusive kind. It is known that the product, when strongly heated in a current of ammonia gas, affords ammonium chloride, which volatilises, and a residue, to which Schutzenberger and Colson have assigned the formula $Si_2N_3H$. This body they regard as a definite hydride of $Si_2N_3$, which latter they produced by acting on silicon at a white heat with pure nitrogen. Gattermann suggests that a nearer approach to the silicon analogue of cyanogen, $Si_2N_2$, should be obtained from the product of the action of ammonia on silicon-chloroform; but it does not appear that this suggestion has yet borne fruit. It was scarcely probable that the above-mentioned rather indefinite compounds of silicon with nitrogen were the only ones of the class obtainable, since bodies including carbon combined with nitrogen are not only numerous, but are among the most important carbon compounds known. Further investigation was therefore necessary in the interests of comparative chemistry, and for special reasons which will appear later on; but it was evident that a new point of attack must be found.

A preliminary experimental survey proved the possibility of forming numerous compounds of silicon containing nitrogen, and enabled me to select those which seemed most likely to afford definite information. For much of this kind of work silicon chloride was rather too energetic, hence I had a considerable quantity of the more manageable silicon tetrabromide prepared by Serullas' method, viz., by passing the vapour of crude bromine (containing a little chlorine) over a strongly heated mixture of silica and charcoal. In purifying this product I obtained incidentally the chloro-bromide of silicon, $SiClBr_3$, which was required in order to complete the series of possible chlorobromides of silicon.*

Silicon bromide was found to produce addition compounds very readily with many feebly basic substances containing nitrogen. But one group of bromides of this class has yet been investigated in detail, namely, the products afforded by thioureas. The typical member of this group is the perfectly definite but uncrystalline substance—

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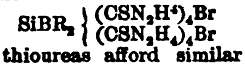
* Three years later Besson formed the same compound, and described it as new.



$$\mathrm{SiBR_2}\left\{\begin{matrix}\mathrm{(CSN_2H^4)_4Br}\\ \mathrm{(CSN_2H_4)_4Br}\end{matrix}\right.$$

Substituted thioureas afford similar bodies, the most interesting of which is the allyl compound. This is a singularly viscid liquid, which requires several days at ordinary temperatures to regain its level, when a tube containing it is inverted. But these are essentially addition compounds, and are therefore comparatively unimportant.

In most cases, however, the silicon haloids enter into very definite reaction with nitrogen compounds, especially when the latter are distinctly basic, such as aniline or any of its homologues. One of the principal products of this class of change is the beautiful typical substance on the table, which is the first well-defined crystalline compound obtained in which silicon is exclusively combined with nitrogen. Its composition is $\mathrm{Si(NHC_6H_5)_4}$.* Analogous compounds have been formed with the toluidines, naphthylamines, etc., and have been examined in considerable detail, but it suffices to mention them and proceed to point out the nature of the changes we can effect by the action of heat on the comparatively simple anilide.

*(To be continued.)*

## Provincial Transactions.

### MIDLAND PHARMACEUTICAL ASSOCIATION.

The excursion in connection with the Recreation Section of the above Association took place on Wednesday, September 13, to Solihull. During the afternoon a cricket match and other games were indulged in and, after tea at the George Hotel, a concert was held, during the course of which the President stated that in the Cricket Section 14 matches had been played during the season—6 won and 4 drawn. The Tennis Section too had had a successful season, and in the Cycling Section a number of runs had been made to places of interest all round Birmingham. The company arrived in Birmingham shortly before 11, after having spent a most enjoyable half day's outing.

### EDINBURGH PHARMACY ATHLETIC CLUB.

The second annual excursion of the Club took place on the local autumn holiday, Monday, 18th inst., to the ancient burgh of Linlithgow. About forty members and friends attended. In the forenoon a cricket match, "Ladies *v.* Gentlemen," took place in the grounds of Linlithgow Palace. Gentlemen played with left hand only and used a mallet instead of a bat. The ladies, playing a dashing innings, won by 10 runs. Dinner was served in the Town Hall, and the afternoon was devoted to boating on the Loch and rambling. After tea there was an impromptu dance, the music being supplied by Messrs. J. Brown and Buchan; and after a pleasant day's outing the company returned to town by train at 9 o'clock.

## Parliamentary and Law Proceedings.

### INLAND REVENUE PROSECUTIONS.

#### SALE OF METHYLATED SPIRIT ON SUNDAY.

At a Justice of Peace Court in Aberdeen on Wedesday, September 13, Robert Black, licensed dealer methylated spirit, Justice Street, Aberdeen, was arged, under the 1889 Revenue Act, with selling methylated spirit on Sunday. The 26th section of the Act, under which Black was charged, prohibits the sale of methylated spirit from 10 o'clock on Saturday night to 8 o'clock on Monday morning, the penalty for a breach of the law being £100. Black was charged with having sold 2 gills of the spirit to May Murdoch, outdoor worker, Chapel Lane, on Sunday, July 9, and he admitted the charge.

Mr. James Taylor, Inland Revenue officer, said it was at one time found that methylated spirit was being largely consumed on Sundays in Ireland and in the large cities in Scotland, and in 1889 an Act was passed specially to prevent its sale on Sundays. He did not think the spirit had been very largely consumed in Aberdeen, but the police authorities had informed him that it was to some extent consumed on Sundays. On the present occasion, Mr. Black sold the spirit on the very pressing representation of the woman Murdoch, who said she required it for polishing purposes, and that it had to be used very early on Monday morning. The offence was, of course, a very serious one, seeing that an Act had been passed specially to prevent the sale of the spirit. As this was the first case, however, a small penalty might be sufficient.

A fine of 30*s.*, with the alternative of seven days' imprisonment, was imposed. It is of some interest to note that the above is the first prosecution that has taken place anywhere under the Act of 1889.—*Aberdeen Evening Gazette.*

#### SALE OF METHYLATED SPIRIT WITHOUT A LICENCE.

At Alfreton Police Court, on Friday, September 15, William Henry Wilbraham, chemist, Somercotes, was summoned for selling one pint of methylated spirit without being duly licensed to do so, on July 3.

Mr. W. W. Nelson appeared to prosecute on behalf of the Inland Revenue, and he stated that the defendant was liable to a penalty not exceeding £50. The defendant kept two shops at Somercotes, one being managed by himself and the other by his nephew, Mr. Booth.

Mr. C. Brien, supervisor of Inland Revenue, said on July 3 he visited defendant's shop at Somercotes, and bought 6*d.* worth of methylated spirit. He afterwards asked Mr. Booth, who was in charge of the business, if he had a licence. Mr. Booth replied that he had not, as he was under the impression that he did not need one, he only having one gallon in the shop at a time.

Mr. Brown, Excise officer at Alfreton, said the defendant had never renewed the licence from last September. He had cautioned Mr. Booth about selling the spirit without having a licence, but it seemed he insisted on so doing. He had promised him on two occasions to either discontinue the sale of the spirit or get a licence.

Defendant pleaded guilty.

The Bench were of the opinion that it was a serious offence, and they imposed a penalty of £10 and 10*s.* 6*d.* costs.—*Nottingham Daily Express.*

## Reviews and Notices of Books.

CHEMISTRY FOR ALL. By W. JEROME HARRISON, F.G.S., and ROBERT J. BAILEY.*

In times like the present, when, through County Council grants, free technical education is being given to "all sorts and conditions of men" throughout the country, it will frequently happen that the teacher of chemistry finds himself endeavouring to quicken the perceptions of a class wofully ignorant of anything resembling scientific information or training, and whose ideas of chemistry, if they have any at all, are extremely crude, if not altogether incorrect. In such a case the text-book to be used must be one whose pages shall supply numerous easily comprehended object-lessons, written in simple, concise language, and devoid of equations, chemical arithmetic, and similar matters, which often prove disheartening and even repellent to this particular class of student. The book before us is written primarily as a guide to the Alternative First Stage in Inorganic Chemistry, recently instituted by the Department of Science and Art. It broadly illustrates, by means of familiar substances such as air, water, carbon, chalk, sugar, etc., etc., the fundamental principles which underlie chemical and physical phenomena, rather than attempts to deal at length with the chemistry of any particular group of elements and their compounds. Though a small book, a large amount of information is accurately and clearly conveyed, while the experiments may, for the most part, be easily compassed and with but little expense. Hence it should not only be of service to the student with the specific examination in view, but also supply a want frequently felt for a text-book suitable for those who are making their first steps in the domain of scientific knowledge. It may be well to note that the price list of apparatus and chemicals at the end of the book, to which the authors, in their preface, direct attention, is either very much out of date, or has been badly treated by a careless compositor, as such prices as 3*s*. per ounce for mercury, 10*d*. per ounce for ammonium chloride, 8*d*. per pound for sulphuric acid, etc., etc., will hardly allow of the average student indulging to any great extent in experimental work.

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* Harden has obtained an uncrystalline intermediate mpound $\mathrm{SiCl_2(NHC_6H_5)_2}$.

* London: Blackie and Son. Pp. i.-iv., 1 to 150. 1s. 6d.

**TABULATED LIST AND SYNOPSIS OF MATERIA MEDICA. By C. STEPHAN, Pharmacist, Dresden.***

The matter in this publication is intended to accompany a collection of drugs official in the British Pharmacopœia, of which the common names and botanical or zoological equivalents, geographical sources, natural orders, chief active principles, and official preparations are mentioned. A protest must be entered against the suggestion made in the preface, where it is stated that the list "places all the information that the student must learn by heart in a compact form, and is so arranged that it can be easily committed to memory." These words are carefully underlined in the original, and the implied advice, if followed, may lead to grave and mischievous results. As a matter of fact, such tabulated lists and synopses are of very great value, but only when compiled by each student for individual use, whilst consistently and systematically working through the chosen text-book. Just as it is one of the most equivocal kindnesses to lend lecture notes, etc., to students, so is it the least satisfactory way of acquiring knowledge to endeavour to assimilate summaries prepared by others. It is to be hoped, by the way, that nothing like a faithful representation of the present condition of pharmacy in Germany is indicated by the remark of the author of this compilation, to the effect that he was first induced to prepare a carefully arranged collection of all the official drugs of the German Pharmacopœia because "of the ever decreasing use in pharmacies of drugs in their raw and unprepared state."

## Obituary.

Notice has been received of the death of the following:—

On the 14th of September, Benjamin Ward, Chemist and Druggist, Newcastle-on-Tyne. Aged 84.

On the 18th of September, William James Bowles, Chemist and Druggist, Kensington. Mr. Bowles was a divisional secretary of the Pharmaceutical Society.

## Correspondence.

### DISPENSING DIFFICULTY.

Sir,—Since reading the letter of "J. T. W." in the Journal of September 16, I have been wondering what was the article he dispensed, as terchloride of antimony, $SbCl_3$, is far too deliquescent a body to be kept in a state of powder. This was certainly a case to consult the prescriber before dispensing.

*St. Ives.* ERNEST E. G. DENNIS.

Sir,—Referring to the "dispensing difficulty" of "J. T. W." in the Journal of September 16, I should say that liq. antim. chlor. was intended, as that is the only B.P. preparation, and should have been sent unless the prescriber was interviewed.

PHARMACEUTICAL CHEMIST.

Sir,—I am at a loss to understand how your correspondent "J. T. W." could have conceived the idea that antim. chlor. should mean antim. terchlor. Would he supply hydr. perchlor. for hydr. chlor.? Had he looked in Muter's 'Chemistry' he would have found antimonious chloride *syn*. butter of antimony. I am frequently called upon to dispense antim. chlor., and always send liq. antim. chlor. Antim. terchlor. is not in the B.P. Should the dispenser have any doubt, it would be his duty to see the prescriber before sending out such a powerful preparation as antim. terchlor.

"E. M. B."

Sir,—In reply to "J. T. W." as to his dispensing difficulty in last week's Journal, I cannot help thinking that the doctor who wrote the prescription was at fault, not only in writing a prescription in such an indefinite manner, and also in abusing the dispenser, but most of all to tell the patient that it was made up wrongly. At the same time I think "J. T. W." was a bit to blame in sending "antim. terchlor." in powder; he should have ascertained, if possible, from the person who tendered the prescription how it was to be used. Undoubtedly the doctor's intention was "liq. antim. chlor.," and his object for putting it into a wide-mouthed bottle was so that the patient could easily dip a brush into the liquid; or if antim. terchlor., the consistency of butter (which it should be), had been sent, in my opinion there could then not have been any possible blame on the side of the dispenser. Certainly the doctor ought to retract what he told the patient, and also apologise for being abusive.

"FAIR PLAY."

Sir,—Your correspondent "J. T. W." has slightly puzzled me *re* antim. chlorid. On referring to Muter's 'Chemistry' I cannot find how "J. T. W." has obtained antim. terchlor. in powder. Muter gives butter of antimony as a synonym for antimonious chloride, which would undoubtedly mean liq. antim. chlor. B.P. ASSISTANT.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Brown, Clark, Cruickshank, Foster, Harrison, Mair.

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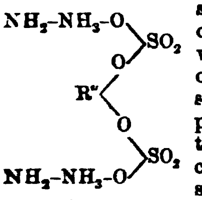
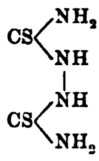
* London: Thomas Christy and Co. 2*s*.

## "THE MONTH."

**Arsenic and its Compounds.** Dr. Retgers finds that there are only two well-defined allotropic modifications of arsenic, and that they closely correspond to the two forms of phosphorus. A silvery-white hexagonal form accords with the red phosphorus, and a black variety, crystallising in regular octahedrons, corresponds with ordinary yellow phosphorus. It is suggested that there may be a third modification with crystals belonging to the monoclinic system. The brown spots formed upon the cold porcelain, in Marsh's test, are shown to consist of arsenic hydride, AsH, produced by the partial dissociation of the gaseous $AsH_3$. This is soluble in boiling xylene and may thus be distinguished from elementary arsenic, which is totally insoluble in xylene. Dr. Retgers also adduces evidence which seems to prove that a lower oxide of arsenic, probably $As_2O$, is capable of existence (*Zeit. für Anorg. Chem.*, iv., Aug.).

**Hydrazin.** F. Schrader shows that the hydrate of this compound, $N_2H_4{\cdot}H_2O$ (*Pharm. Journ.*, [3], xix., 702), decomposes sooner or later, even when enclosed in sealed tubes, ammonium hydrate being the chief product formed. He also describes a series of double sulphates with the general formula $R''SO_4{\cdot}(N_2H_4)_2{\cdot}H_2SO_4$, where R'' may represent copper, nickel, cobalt, iron, manganese, zinc, or cadmium. They contain no water of crystallisation, dissolve with difficulty, and may be prepared by simply mixing solutions of the constituent sulphates. The accompanying formula probably represents the constitution of the double salts. Double chlorides of fixed composition were only prepared with difficulty. A new compound of hydrazin was prepared by saturating the hydrate with sulphocyanic acid or by decomposing the sulphate with barium sulphocyanide. The resulting hydrazin sulphocyanide, $N_2H_4{\cdot}HSCN$, is described as a deliquescent substance, melting at 80°. On heating it for four or five hours in a sealed tube at 100°, another new compound, of urea-like constitution, was formed, hydrazin sulphocarbamide— This is described as crystallising from a hot aqueous solution, melting at 214°-215°, and possessing acid properties (*Chem. Zeit.*, xvii., Sept.).





**Oxygen Manufacture.** G. Kassner describes a method of obtaining oxygen from the air by the agency of calcium plumbate, $Ca_2PbO_4$. This compound, in a spongy porous condition, is exposed to the action of well-washed furnace gases and rapidly absorbs the carbon dioxide present, calcium carbonate and lead peroxide being formed. These products are then heated to redness and oxygen is rapidly disengaged. When most of the oxygen has been liberated, carbon dioxide begins to come over, at first mixed with oxygen, but subsequently in a pure state. The mixed gases are passed over calcium plumbate, which absorbs the carbon dioxide and allows only the pure oxygen to escape. When the carbon dioxide ceases to be evolved from the retort, a current of air is driven through and re-converts the residue into calcium plumbate, which may then be used for a subsequent operation (*Chem. Zeit.*, xvii., 1242).

**Solution of Platinum.** W. L. Dudley finds that platinum black, when moistened with dilute hydrochloric acid on a filter and exposed to the air, is gradually dissolved, platinic chloride being formed. The action seemed most rapid when the filter paper approached dryness. Platinum sponge behaved in a similar way, but the effect was not so marked. The chloride was also formed when platinum black or sponge was subjected to the action of a dried mixture of hydrochloric acid gas and air. Experiments with iridium, rhodium, ruthenium, and osmium, in a finely divided condition, yielded similar results (*Journ. Am. Chem. Soc.*, xv., 272).

**Acetone as a Tannin Solvent.** Trimble and Peacock, in a paper read at a recent meeting of the American Pharmaceutical Association, devoted special attention to the use and value of acetone as a solvent of oak tannins. By its aid they extracted from powdered nutgalls 62·24 per cent. of solids, whereas commercial ether removed 59·77 per cent. only. It is a better solvent of tannin than either alcohol or ether, and extracts it with less admixture of sugar and other carbohydrates. Its low boiling point, also, renders its recovery easy and rapid, without risk of decomposing the tannin. The process recommended as satisfactory is as follows :—The powdered oak bark is moistened with acetone, packed in a closed percolator, allowed to macerate with acetone for forty-eight hours, and then percolated until exhausted. A dark red or brown semi-solid extract is left on distilling off the solvent. On treatment of this with water and filtering, dilution of the filtrate with more water results in the precipitation of anhydrides, and, after successive agitations of the filtrate with acetic ether, the tannin thus separated is further treated with ethylic ether, and finally obtained in a nearly pure form in which it is readily and completely soluble in water.

**Chestnut Tannin.** In the consular report on the trade of Cherbourg and district for 1892, it is stated that the export of an extract from the bark of chestnut trees, used for tanning leather, is developing, having reached 150 tons to 200 tons per month, whilst on the opening of a new factory at Dinan it was expected that these figures would be doubled. It will be remembered that the tannin of the chestnut tree was found by Trimble (*Pharm. Journ.*, [3], xxiii., 4) to resemble gallo-tannic acid in all its reactions, so that the substances are probably identical.

**Vanillin from Cloves.** Professor Jorissen and E. Hairs, noting the similarity in composition between vanillin and eugenol, have examined cloves and the essential oil obtained from them to ascertain whether vanillin was one of their constituents. An ethereal tincture of cloves was prepared and treated with solution of sodium acid sulphite. This solution, being separated, was then treated with a mineral acid and the sulphurous acid thus liberated removed, after which the mixture was agitated with ether. This, on being separated and evaporated, left a residue which gave off a strong odour of vanilla. A similar, crystalline residue was obtained on subjecting oil of cloves to the same treatment. The crystals were soluble in water, especially when warm, also in alcohol and ether. They were coloured by ferric chloride, began to melt at 79°, and sublimed readily. The yield was very small, so that an extended examination was not possible, but the investigators consider that the physical and chemical characters of the product, so far as they have been ascertained, indicate its identity with vanillin (*Bull. de l'assoc. belge des chim.*, through *Bull. de pharm. de Bruxelles*, xxxvii., 231).

**German Otto of Roses.** The rose plantations established two years ago in the suburbs of Leipzig have been so successful that they have been largely extended. The trees have withstood the severe weather of the recent winters and developed most satisfactorily. It is stated that great heat is objectionable in the culture, a cool temperature and a somewhat moist condition of the atmosphere being the chief conditions of a good yield. A factory has been built in the midst of the rose fields which will consume 50,000 Kilos. of leaves daily, and is expected to produce as a minimum about 40 Kilos. of essential oil, the estimated value of which, together with that of the rose-water and pomade produced, will be from £2000 to £2500. Only the requisite quantity of flowers for immediate use will be gathered at any one time, and the roses will be but a few minutes in passing from the trees into the macerating receptacles. It is claimed that the oil produced in Saxony last year was better than the Turkish product, in delicacy, strength, and the lasting character of its perfume (*Kew Bulletin*, 80, 229).

**Glucose in Syrups.** G. H. C. Klie exhibited, at the recent meeting of the Missouri State Pharmaceutical Association, some specimens of syrups made with glucose in place of ordinary sugar, the condition of which seemed to indicate that this method possesses advantages in certain cases. Syrups of hydriodic acid and of iodide of iron were shown which had been made in March, 1892, and indicated no trace of deterioration. One sample of syrup of iodide of iron was made with glucose alone and another with fifty per cent. only of the sugar replaced by glucose. Both were purposely kept without special care, the bottles being only half filled and exposed to light. The syrups remained, however, in excellent condition, and it was suggested that the proportion of glucose might be still further reduced without affecting the permanency of the products. It was stated that the syrups could be dispensed from shop rounds like any ordinary syrup, needing no special precautions.

**Salol Suppositories.** H. Barnouvin points out that, though by the ready solubility of salol in melted cocoa butter this would seem the simplest method of preparing suppositories containing the compound, a difficulty is caused by the fact that the mixture remains fluid much below the temperature at which either of the constituents solidifies. It is therefore necessary to melt the cocoa butter with the least possible amount of heat and stir in the salol or, preferably, to make a paste of the former in a mortar and then incorporate the salol, thus producing a soft homogeneous mass which may readily be pressed into a mould (*Répertoire*, [3], v., 387).

**Salol Camphor.** This is described in the 'Extra Pharmacopœia' as a viscid liquid (salol, 3 parts, camphor, 2), but Barnouvin insists that the solid form is preferable. He shows that mixtures of salol and camphor crystallise rapidly in proportion as the quantity of salol is increased, and he suggests that 10 per cent. only of camphor should be used. The two substances are powdered, melted with a gentle heat, and left to crystallise. This occurs in about a quarter of an hour, and by repeatedly spreading upon filter paper, brilliant, dry, white crystals result and may be powdered. In this form the salol camphor is said to admit of several therapeutical applications for which the liquid form is not available (*Répertoire*, [3], v., 388).

**Syrup of Iodide of Iron.** M. Roussillon prepares this syrup from a solution which he claims to be unalterable when kept. Iodine, 16·40 Gm., iron filings, 8 Gm., and distilled water, 30 Gm., are heated together until the reaction is complete, and the solution filtered whilst hot into a vessel containing pure glycerin, 220 Gm. The filter is washed with a jet of boiling distilled water, and the mixed liquids are then warmed gently until the contents of the vessel weigh 240 Grammes. The solution is immediately poured into well-dried vials, containing when filled 18, 36, and 72 Grammes respectively, these are at once corked securely and, when cool, the corks are well paraffined. When required for use the contents of the vials are mixed with sufficient syrup to make ¼, ½, or 1 Litre of syrup of iodide of iron, according to size, and both the solution and syrup thus prepared are said to keep without change (*Journ. de pharm.*, [5], xxviii., 243).

**Cocillana.** This is the name given to a drug obtained from a species of *Guarea* (Meliaceæ), reputed to possess expectorant properties (*Am. Journ. Pharm.*, lxii., 178). A collective study of it has been made by Drs. Rusby, Coblentz, and Wilcox, on similar lines to those suggested in the *Pharmaceutical Journal* of July 2, 1892, and their reports appeared in the *Brooklyn Medical Journal* for July last. Only the thicker bark from the trunks and larger branches of the trees is collected. It yields 0·13 per cent. of a white crystalline body, having a peculiar aromatic taste, soluble in ether, chloroform, acetic ether, and glacial acetic acid, but insoluble in alkalies and, when heated with water, melting to oily globules which congeal on cooling. The melting point of the compound, which is apparently a solid hydrocarbon and requires further investigation, is 80°, and above that point it sublimes. Traces of alkaloid were indicated by Mayer's reagent, and a resin (2·36 per cent.) and fixed oil (2·50 per cent.) were also found, whilst a glucoside is also probably present. The preparations of the bark employed in the clinical investigation were a concentrated tincture, a fluid extract, and a syrup. It is claimed that, in diseases of the respiratory organs, the drug is superior to apomorphine, preferable to ipecacuanha, and safer than pilocarpine.

**Sugar-Cane Disease.** During the last few years a disease has made its appearance amongst the sugar-canes in the West Indies, which was supposed to be caused by a fungus. Specimens were sent to Kew for examination, and it is now conclusively proved that the disease is caused by one special fungus, an undescribed species of *Trichosphæria*. This has three distinct forms of fruit which are very different in general appearance. In the conidial condition, a delicate dark-coloured velvety mass appears on the surface of wounded parts of the canes; the melanconium form is indicated by minute black filaments bursting through the cuticle of old canes; whilst, in the ascigerous form, minute, black, hairy perithecia appear on dead and decayed portions of cane. Conidia obtained from a pure culture, placed on the unbroken surface of very young leaves of lateral shoots of a healthy sugar-cane plant, produced deep red blotches in five days. In fourteen days the conidial form of the fungus was perfectly developed, the mycelium having passed into the shoot and adjoining leaves, and soon afterwards the young infected shoots decayed and dropped off, the mycelium having then reached the tissues of the parent stem. The fungus causing this disease is found to develop readily on the young leaves of the bamboo. The conidia will not germinate nor the mycelium grow in a one per cent. copper sulphate solution (*Kew Bulletin*, 79, 149).

**Ferment in Fungi.** E. Bourquelot shows that numerous fungi, and particularly those that develop upon living or dead trees, contain a soluble ferment which possesses the property of splitting up various glucosides—amygdalin, salicin, coniferin—and, though he is not yet able to prove its identity with the emulsin of almonds, it acts in the same manner and upon the same compounds as the latter substance (see *ante*, p. 83). The method of extraction adopted by Bourquelot was to express the freshly gathered fungi or expose them in an atmosphere saturated with ether or chloroform vapour, thus causing an abundant exudation of liquid. In either case the fluid contains a large proportion of the principles existing in the fungi, and it can either be placed in contact with a glucoside direct, or by precipitation with alcohol a powder can be obtained which serves for use subsequently, requiring only to be dissolved in water. An alternative method is to triturate the fungi with sand and then treat with water and filter. The precipitate containing the ferment obtained from the *Polyporus sulphureus*, Bull., was found to decompose 45·7 per cent. of its own weight of amygdalin, a very pronounced odour of bitter almonds being given off and glucose formed. Similarly, coniferin was decomposed by the juice of the *Auricularia sambucina*, Mart., and salicin by the exudation from the *Polyporus fomentarius*, L., the conversion in the former case being complete, and in the other equal to 35·8 per cent. of the glucoside taken. A list of nineteen other fungi is given, in which the presence of the same ferment was proved, and it is noted that in almost every instance the species are such as are found upon living trees or old wood. Since glucosides are so frequently present in the bark, cambium, or wood of trees, it is suggested that, by the action of the ferment in the fungi, the trees may be enabled to utilise the glucosides for their nourishment, by the formation as a decomposition product of readily assimilable glucose (*Comp. rend.*, cxvii., 383).

**Micro-chemical Identification of Sulphur.** F. Emich places a minute quantity of the substance to be tested on a slide, covers it with a drop of calcium chloride solution (5 to 25 per cent.), then inverts the slide for three to five minutes over a bottle of saturated bromine water, though with some natural sulphides a longer exposure is necessary. On examining the specimen under the microscope, characteristic crystals of calcium sulphate should be visible in the drop, and Emich claims to have recognised such crystals when as little as 0·00002 Milligramme of sulphur was originally taken. Though the reaction is not a general one for sulphur when contained in organic compounds, it may be employed for sulphocyanides, sulphurea, mustard oils, ethyl sulpho cyanide, and potassium xanthate (*Zeits. anal. Chem.*, xxxii., 163).

**Inoculating Culture Tubes.** Beneke recommends that gelatin culture tubes should be inoculated by making a puncture quite at the side of the medium, close to the glass. The advantage of this method over the older plan of inoculating the mass in the middle is that the growing culture can be microscopically examined from the outside and various details made out, such as the nature of the growth, the comparative appearance of colonies near the surface and those situated more deeply, and the presence of one or more distinct organisms. If the tubes used have the opposite sides flat and parallel, such examinations will be still further facilitated (*Cent. f. Bakt.*, through *B. M. G. Epit.*, 48).

**Examining Cilia of Bacteria.** The cilia or organs by which micro-organisms effect locomotion are very difficult of detection unless stained, and the best results in this direction, up to the present time, have been obtained by the adoption of Loeffler's method, which is somewhat complicated, and must be varied according to the nature of the particular specimen under treatment. M. Nicholle and V. Morax recommend a modification of this process as affording satisfactory results. A specimen is taken from a recent gelatin culture and diluted with water. A little of the fluid is then transferred to a warm cover-glass by means of a pipette and allowed to dry, after which a drop of the following mordant is applied:—Aqueous solution of tannin (20 per cent.), 10 C.c.; cold saturated solution of ferrous sulphate, 5 C.c.; saturated solution of fuchsine in absolute alcohol, 1 C.c. The cover is next heated gently for a short time until vapours are given off, then washed carefully. This process is repeated two or three times, and the specimen washed after each application. Subsequently, staining is effected by means of Ziehl's fuchsine solution (see Squire's 'Methods and Formulæ,' p. 59), the cover is afterwards warmed once or twice for about fifteen seconds, then washed, and the specimen examined in water to ascertain if the colour is sufficiently intense. If satisfactory, the preparation may then be dried and, finally, mounted in xylol or benzol balsam (*Ann. de l'inst. Pasteur*, vii., 554).

**Incoagulable Albumin.** This culture medium for bacteria is prepared by E. Marchal by adding a solution of ferrous sulphate (1 in 1000) to a filtered solution of fresh egg albumin in distilled water. As many cubic centimetres of the iron solution are added to each litre of the albuminous solution as the latter contains parts per cent. of albumin. Thus to a 5 per cent. solution of albumin, add 5 C.c. of the ferrous sulphate solution. The salt prevents coagulation on heating, and the mixture can be at once sterilised in an oven at 115°. The medium is described as perfectly limpid, and having a slightly alkaline reaction. In use it replaces the ordinary bouillons (*Bull. Soc. Belge Micr.*, xix., 64, through *Inter. Journ. Microscopy*).

**Carmalum.** This is the name given to the most recent carmine stain for histological purposes. It has been devised by Dr. Paul Mayer, and is very easily prepared. One gramme of carminic acid is placed in a suitable vessel, together with ten grammes of ammonia alum and 200 C.c. of distilled water. The mixture is then heated nearly to boiling point, until solution is effected, and, after cooling, carefully decanted or filtered, when it is ready for use. The addition of a small crystal of thymol keeps the solution free from organic growths. It is a dark red liquid of great staining power and, like picrocarmine, will stain objects satisfactorily that have been fixed in osmic acid. It is said to tinge the protoplasm slightly as well as the nucleus (*Nat. Science*, iii., 113).

**Aniline Stains.** A general recipe for these stains, recommended by Hermann and said to serve equally well for safranine, gentian violet, eosine, fuchsine, fuchsine S, dahlia, and orange G, is as follows :—Staining substance (dry), 1 Gramme; absolute alcohol, 10 C.c.; aniline water, 90 C.c. As thus prepared anilines are said to stain very intensely and sharply. Washing out should be done in absolute alcohol, though with safranine acid alcohol may be used. The solutions require to be used fresh, as they do not keep very long (*Nat. Science*, iii., 121).

**Staining Connective Tissue.** Pharmacists who are called upon by medical practitioners and others to prepare animal tissues for microscopic examination may find Beneke's process for staining connective tissue a useful one. It is a modification of Weigert's method for staining fibrin, and by means of it Beneke claims that the connective tissues of the most diverse organs can be consistently stained. Portions of tissue that has been fixed in alcohol, having been embedded in paraffin and cut, the sections are attached to slides in the usual way and stained for ten to twenty minutes with aniline gentian violet (aniline oil, 10 parts, well shaken with water, 100 parts, then filtered, and concentrated alcoholic gentian violet solution, 5 to 10 parts, added to the filtrate). Afterwards treat for one minute with lugol solution of a port wine tint, dry with filter paper, and decolorise with aniline xylol (aniline oil, 2 parts, xylol, 3 parts). Decolorisation having been stopped at the right point, which must be judged from experience, mount the sections in xylol balsam. The fibres of the connective tissue should appear stained various shades of violet (*Centralb. f. allgem. Path.*, through *B. M. J. Epit.*, p. 40).

**Bleaching Sections.** An ingenious method of bleaching histological sections before staining is described by E. A. Minchin, and consists in placing the sections in a bottle of 80 per cent. alcohol, having a layer of potassium chlorate crystals at the bottom. A few drops of concentrated hydrochloric acid are then cautiously added and the bottle is subjected to a gentle heat. The chlorine evolved is said to bleach sections in about an hour (*Nat. Science*, iii., 121).

**Fixing Microscopic Objects on Slides.** To fix minute objects in a definite position on a glass slide J. Tempère applies to the particular part of the surface of the latter, after warming (at about 40° to 50°) to remove all traces of moisture, a drop of a medium prepared by dissolving on a water-bath 15 Grammes of white lac in 100 Grammes of absolute alcohol, and decanting off the clear liquid after standing awhile. As the alcohol evaporates from the warmed surface of the glass a hard transparent coating is left. This may be slightly softened at any time by means of a drop of oil of lavender, and after arranging the objects the heat of a spirit lamp will cause the oil to evaporate, leaving them firmly attached. Objects may be mounted on cover glasses in a similar way. A resinous mounting medium may then be employed in the usual manner. If glycerin or glycerin jelly be the mounting medium used, collodion diluted with two or three times its volume of oil of lavender may be found preferable as the fixing agent. The sections, etc., should be placed in position before the preparation dries and the oil evaporated at a temperature of about 50° (*Micrographe préparateur*, i., 81).

**Automatic Extractor.** Under this name, W. D. Horne describes a simple and ingenious apparatus which mechanically delivers a gentle stream of water upon precipitated matter on a filter, and so ensures thorough washing without special attention. The washing is done regularly too, and there is no loss of time. The water supply is contained in a wide-mouthed bottle of 250 C.c. capacity, closed by a cork through which pass two glass tubes, extending just within the bottle. One tube tapers to a moderately fine point, projecting about 3 or 4 Cm. outwardly, whilst the other is twice bent at right angles, and is sufficiently long to reach to the bottom of the bottle outside. When the bottle is inverted air enters by the long tube and bubbles up through the water, which then flows or drops from the shorter tube. The flow is best controlled by regulating the supply of air through the long tube. To convert the stream of water into an intermittent one, suspended below the bottle is a tube, somewhat like an Adams' fat extractor, containing a capillary siphon tube, the longer limb of which passes through a stopper at the bottom. It may readily be made by cutting the bottom off a test-tube (15 Mm. in diameter and 15 Cm. long) and closing one end with a rubber stopper. The siphon tube should be made of glass tubing 3 Mm. in diameter, and have its limbs 15 Cm. and 3 Cm. long respectively. From the short limb hang a piece of rubber tubing, pass the longer one through a hole in the rubber stopper, so that the siphon is quite inside the test-tube, then suspend the whole arrangement beneath the exit tube of the water bottle by means of a short piece of wire attached to the bend of the siphon tube. When the apparatus is in use, water will drop into the suspended tube until its surface rises above the bend of the siphon, and the liquid will then be discharged into the filter placed beneath. The lower end of the rubber tube should be cut diagonally to ensure complete emptying of the siphon at each delivery, and by also varying the length of this tube and regulating the dropping of water from the reservoir it is easy to so arrange that the right quantity is delivered into the filter each time, and that this shall pass completely through the filter before a further supply is delivered. Though a few supplementary washings by hand may be advisable, to get all the precipitate into the point of the filter, the mechanical washing is said to give results identical with the more tedious method (*Journ. Am. Chem. Soc.*, xv., 270).

## THE POSITION OF THE PHARMACIST.*

### BY DR. MERVEILLE.

Too frequently pharmacists imagine that they are scorned and unjustly accused by the medical profession, but there is really nothing in this fancy, in point of fact, for such conduct would be both profoundly absurd and absolutely undeserved. For my part, I respect and honour the profession of pharmacy as much as that of medicine so long as both are practised with a proper sense of duty. If this condition be not fulfilled one may well permit one's-self, without hesitation, to despise and oppose the unworthy pharmacist as much as the prevaricating doctor. As to the reason I profess these sentiments of esteem towards the pharmacist, it is very simple, though it may seem somewhat astonishing, at first sight, to certain of my readers. It is because I am attached to my profession and recognise in the medical practitioner a man whose energies are largely devoted to the service of his fellow creatures, and render him accordingly worthy of respect.

Now the pharmacist is entitled to the same esteem, for he participates in the public labours of the medical man, and is his valued and indispensable fellow worker. The doctor who is the best informed, most capable of solving a diagnostic difficulty, and most expert as a therapeutist, cannot carry on his work properly without the joint action of the pharmacist. All the good that the former may be able to do, if he is seconded by a conscientious pharmacist, will be rendered impossible if the individual entrusted with the dispensing of his prescriptions should not be scrupulously conscientious in the performance of his work. It is with the assistance of the pharmacist that the doctor neutralises the toxic symptoms in cases of poisoning, saves the life of a patient attacked with hemorrhage, and snatches from death those who are on the point of expiring. But it must not be forgotten that, if the pharmacist has not a very clear idea of his duty, the poison, hemorrhage, and death may be able to accomplish their work and he will be responsible for it.

The pharmacist who does properly understand his work has the right to be proud of his profession. It might almost be said that his position is more meritorious than that of the medical man, for it is more unpretending and less is known about his work. The practitioner who contends with disease at the bedside of the patient, and follows its progress step by step, is yet conscious of a grim satisfaction in the struggle, and enjoys his triumph when successful. The pharmacist, his fellow worker, who places in his hands the weapons of his choice, is a stranger to these pleasures, however. It is not on the part of the public but in his own conscience that he finds the cheering testimony that he has done his duty.

It is seen then that the pharmacist is not, in my opinion, simply a dealer in drugs, nor only a more or less expert chemist. The impression that I have formed of his position in society is that it is a much loftier one. But then the question arises, do pharmacists comprehend this position themselves? We leave out of account the black sheep that exist in all professions; but do the pharmacists of reputed honesty of purpose understand the great responsibility which devolves upon them? Does each one scrupulously fulfil his obligations, and these in their entirety? We must look to facts for a reply.

The pharmacist is, as has been already said, the fellow worker of the doctor in the noble work of the alleviation of disease. It is upon this idea that the whole professional life of the pharmacist should be based. It is this idea which should impel him to contribute, by the quality of his medicinal preparations, towards securing the effects desired by the medical man, without ever wishing to substitute himself for the latter or disparaging his work. It is this also which calls upon him to assure himself, by analysis, of the strength of his preparations, and endeavour to render medicines as readily assimilable as possible, whilst exercising care to scrupulously perform what the doctor directs and according to his wishes.

I will not stop to consider here the illegal practice of medicine by pharmacists, which is always an absurdity and often not far short of criminal. Nor is it necessary to speak further of the necessity of analysis and the desirability of always having the finest quality of drugs, for these are truths which no one can contest. I would prefer rather to come down to the inner life of pharmacy and show what minutiæ and doubts must be considered by the pharmacist in the performance of his duties. . . . . There is a widely extended practice in the world of pharmacy, which consists in making all kinds of preparations from fluid extracts. It is unnecessary to consider whether these products are worthy of commendation or not, for it is known perfectly well that some of them are good whilst others are simply detestable. But, from an ethical standpoint, the matter is as clear as possible—the pharmacist should make use of these extracts when the doctor prescribes them, and then only. In acting otherwise, he exposes both patient and doctor to injury, and departs entirely from his proper position. When the doctor prescribes as follows:—"Take one gramme of digitalis leaves and make two hundred grammes of infusion," the pharmacist should not take a pretended equivalent portion of fluid extract and simply dilute it with distilled water. Putting all questions of science on one side, he ought simply to do exactly what is ordered, and should never deviate from the terms of the prescription without referring to the writer of it. To act otherwise is to renounce the just consideration which ought to attach to the name of pharmacist. . . . . To sum up, the pharmacist is not simply a dealer in drugs or a chemist experimenting upon the human organism; he is the associate of the medical practitioner in the great duty of looking after the public health. Both law and common-sense have clearly defined his sphere of action, the bounds of which he should never overstep. Let him scrupulously observe the law, dispense medical prescriptions in a careful manner, show everywhere and always a disinterested, unpretending, and even unrecognised sense of duty, and he will be able to convince himself, at least, that he leads a life of utility in the service of his fellow creatures.

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* *Gazette médicale de Liège*, through the *Répertoire de pharmacie.*

## VANILLA CULTIVATION IN MEXICO.*

At the time of the conquest of Mexico, the Aztecs used the vanilla for flavouring chocolate. The Spaniards learned its use from them and introduced it into Europe. Gathered at first from the vines growing wild in the forests, its cultivation as a special industry became profitable, though just at what date there are no records to show; but we find that as early as 1760 there were *vainillales*, or vanilla plantations in the vicinity of Papantla.

A native of Eastern Mexico, this plant grows wild in the State of Veracruz, from one extremity to the other of its coast line, and from the sea beach up to the mountains of the Sierra. It is cultivated mainly in the cantons of Misantla and Papantla, in that State, the little that is produced in Oaxaca being for the most part gathered from the vines which grow wild and uncultivated in the forests.

The vanilla plant belongs to the orchid family, has a pulpy stem which grows to several yards in length, attaches itself to trees, and appears to be little dependent on the soil for nourishment. The leaves are lanceolate and pulpy, and the yellow flowers bud from the axilla formed by the leaves with the stem. The fruit is a pod from six to twelve inches long, and about half an inch in diameter at its thickest part, tapering down towards the stem, curved in its entire length, dark green in its earlier stages, and yellow when fully ripe. It is filled with minute black seeds, somewhat resembling iron filings. When prepared for market, the pod becomes reduced to about a quarter of its original thickness, is black in colour, and, it is needless to say, emits a very agreeable perfume.

Six varieties of vanilla are known in Mexico, namely, the mansa, the cimarrona, the mestiza, the pompona, the puerco, and the mono. Of these the mansa is the only one cultivated. The cimarrona, or wild vanilla, has a more pointed leaf and a thinner vine than the mansa; the pod is shorter, rounder, and thinner. The mestiza has more pointed leaves than the mansa, but less so than the cimarrona; the size of the pods is smaller than those of the mansa, and larger than those of the cimarrona. This variety is scarce, and when prepared it can hardly be distinguished from the mansa. The pompona (*siguexante* or banana vanilla, as the Totonaco Indians, who occasionally eat it, call this variety) has larger and rounder leaves, and a vine one half thicker than the mansa; the pod is double the size, and triangular in shape, resembling somewhat a badly nourished plantain; it has an extremely pleasant smell, not unlike anise, and is used in Habana by the tobacco manufacturers to mix with cigars. The puerco and mono, which grow wild and resemble the cimarrona, are not used in commerce.

There is yet another vanilla, called the tarro, or bamboo vanilla, which is considered by many as a distinct species, but is really nothing else than the mansa grown in the *tarrales* or bamboo thickets in the depths of the virgin forests, where it does not receive a sufficiency of sun and air, and produces a pod thinner and longer than the ordinary mansa.

The vanilla buyers formerly divided the prepared bean into four classes, namely:—

1. The beans or pods from six and a half inches long and upwards, short in the neck or stalk, sound and black; the beans which become split or open, provided they have the foregoing qualities, and the split does not extend more than a third of the pod. This class was again subdivided into *terciada*, which is composed of the shortest pods; *primera chica*, which contains the next in size; *primera grande*, the next; *marca menor*, the next; and *marca mayor*, the largest of all.

2. Those pods which differ from the *terciada* only in being shorter, two of them counting as one of the first class.

3. *Zacate*, or the pods of all sizes which are imperfect through being gathered before becoming properly ripe, or being over cured, *pescozuda*, *vana*, *cueruda*, and *aposcoyonada*, all names for pods in a more or less damaged condition; and *cimarrona* or wild vanilla in good or fair condition, three pods counting as one of the first class.

4. The *rezacate*, composed of the very short pods; of those split clear up to the stalk; of the badly damaged; of the very immature; and of the very much over cured, which resembles a piece of wood; of this fourth class, six pods counted as one of the first class. The quantity of this and of the second class was always very limited.

At the present day, the only distinction made is between the best class and the cimarrona and rezacate, the last two being sold at a very much lower price than the former. Both buying and selling are carried on by count.

## JAPANESE CAMPHOR TRADE.

The total purchases of foreign exporters reached 1713 tons, which is below the business of an average year. Prices ruled in favour of Japanese producers, the lowest having been 35 dols. per picul of 133⅓ lbs. in May, and the highest 63 dols. in December.

These figures represent common crude camphor, which during the year has been doctored and adulterated worse than ever, in spite of high values paid, and the strong protests of purchasers, some of whom now absolutely refuse to have dealings in camphor which has not drained in the warehouses during at least forty-eight hours.

The Formosa drug threatens Japan's monopoly, whenever work in the interior can be conducted regularly and free from the dangerous attacks of aborigines.

The camphor tree of Japan is a huge evergreen of singularly symmetrical proportions and not unlike a linden. Its blossom is a white flower, and it bears a red berry. Some of the trees are fully 15 feet in diameter, and are upwards of 300 years old.

In times gone by camphor was produced in Sumatra and Borneo, and in other parts of the East Indies, as well as in China; now, however, the crude camphor of commerce is a product of Japan and Formosa exclusively, the Formosa supplies having since the war between China and France been very small and uncertain until lately, when the industry was resumed by a German syndicate, upon concessions obtained from the Chinese Viceroy of the island, leading to increased exportation.

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* From the *Revista Financiera Mexicana*, through the *Board of Trade Journal*.

However, great difficulties remain to be surmounted before the trade can be depended on, for the trees are only found inland, where the inhabitants are aboriginal barbarians, who make matters most unpleasant for explorers.

The Formosa drug is inferior to the Japanese, the latter by reason of its greater purity, pinkish colour, and bold grain commanding in foreign countries higher prices, by some 2 per cent. or 3 per cent., in spite of its comparative abundance.

The annual export of Japan camphor averages about 5,000,000 lbs., of which about one quarter reaches the United States of America either direct or *viâ* Europe, the remainder being shipped to Europe, excepting a small quantity sent to India.

The districts in Japan famed for camphor trees are Kiushiu, Shikoku, Iga, Suruga, Isé, and Kishiu. The forests, owned by the people, are now almost denuded of timber, and very little will be left a few years hence. However, the Government forests are still very rich in camphor trees, and it has been estimated that this alone will maintain annually, during the next twenty-five years, the full average supply of crude camphor.

Formerly very little care was bestowed upon the preservation and cultivation of this valuable timber. More recently, however, not only the Government, but also the people, have been giving to this most important question the attention it long ago deserved. Numerous young trees have now been planted, and their growth is being carefully tended. Consequently, although hitherto the youngest wood from which camphor was extracted was about seventy or eighty years old, it is expected that under present scientific management the trees will give equally good results after twenty-five or thirty years.

The roots contain a much larger proportion of camphor than the trees, 10 lbs. of crude camphor out of 200 lbs. of wood-chips being thought satisfactory. The Suruga timber yields a much smaller percentage.

In a village in Kochi (Tosa) there is a group of thirteen trees about 100 years old; it has been estimated that they will produce 40,000 lbs. of crude camphor, and are worth, as they now stand, 4,000 silver dols.

It appears that the only process of extracting camphor from the wood among the mountains in this Empire, and the materials used, are of the roughest and most unscientific description. The wood-chips are boiled, the vapour being conducted into a receptacle containing several partitions, surrounded by cold water. In the sides of these partitions are apertures alternating contrarily, which, when open, cause the vapour to fill the divisions by a circuitous route, thus improving the grain of the camphor.

The crude article is brought to market, as a rule, in very rudely constructed wooden tubs.

To make it fit for shipment requires much work, diligence, and experience. Each tub is carefully sampled, vertically and diagonally, and the samples are tested by fire and sometimes by alcohol. If no solid adulterant is discovered, the condition of the drug is next inquired into, the difficulty of this step being best explained by at once stating that this crude camphor contains a quantity of water, or oil and water, varying anywhere between 5 per cent. and 20 per cent.

This trouble overcome, the rest is comparatively easy, and consists in weighing, cutting, mixing, and packing for shipment, the packing being in tubs prepared on the premises, partly out of the original packages.

Of course the camphor cannot be packed in its present condition, much of it has to be drained and dried, and frequently a special parcel of "dry" must be bought, at a very high figure, for mixing with it.—*Consular Report*, 1260.

## THE STARCHES IN SUBTERRANEAN STEM DRUGS.*

BY ED. S. BASTIN.

(*Concluded from page* 246.)

### *Sanguinaria.*

This drug also contains starch in considerable abundance. The grains are mostly spherical, or nearly so, with the hilum central or subcentral, and not infrequently angularly fissured, the fissures, however, usually small, stratification lines evident only on the larger grains, and then not numerous, polarisation cross usually rectangular and equal-armed. Some of the grains are double, and rarely triple or quadruple ones are found.

### *Geranium.*

Specimens of the rhizomes of *Geranium maculatum* that contain little or no starch frequently occur in the market. This, as already suggested, is probably owing to the season of gathering, for other specimens contain it in considerable quantity. The grains are elongated, often two or three times as long as wide, usually thicker at one end than at the other, frequently somewhat flattened, hilum usually eccentric and located nearer the larger end, or sometimes nearly central, stratification lines seldom visible, and then but faintly, polarisation cross usually oblique angled and unequal-armed. About the hilum is often seen an elliptical, rounded, or somewhat lobed area, less refractive than the rest of the grain.

### *Podophyllum.*

The rhizomes gathered in late autumn, or in early spring, have the parenchymatous tissues heavily charged with small grained starch. The grains are spherical or spheroidal, mostly single, but not infrequently double or triple, hilum central, polarisation cross rectangular and equal-armed, and no stratification curves observable. The hilum is seldom fissured, and is not distinctly visible, except in the larger grains.

### *Valerian.*

Valerians from several different sources were studied, German, English, and Vermont valerian, as well as other specimens of unknown origin. In all, the starch grains are spherical, ellipsoidal, somewhat angular, or more or less irregular, hilum central or subcentral, often slightly fissured or more transparent near the centre, sometimes double or triple, but much more commonly single. Many of the single grains, however, show one or more flat fracture surfaces, concentric markings, few or none except on occasional quite large grains, where they are more numerous and distinct; polarisation cross usually rectangular and equal-armed. An observed peculiarity in valerian is that some of the cells—usually lying near the inner part of the middle cortex—contain starch grains much larger and more distinctly marked than the other cells.

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* From the *Apothecary* for June.

### *Serpentary.*

Serpentary starch consists of spherical, spheroidal, or somewhat angular, simple, or compound grains, the simple ones, however, predominating. The hilum is distinct, but seldom fissured, central or nearly so, and in the larger grains surrounded by a few rather indistinct, concentric, or somewhat eccentric stratification lines. The polarisation cross usually rectangular and equal-armed.

### *Spigelia.*

In spigelia, starch is not abundant, and the grains vary greatly in size and shape. Some are spherical, others ellipsoidal, others ovate, and still others angular and irregular. The hilum, however, is almost central or subcentral, and its position is often marked by a small, straight, V-shaped or X-shaped fissure. Delicate concentric stratification circles are visible on some of the larger grains when viewed in good light. The cross for polarisation is faint for grains so large, and has equal, though somewhat oblique arms.

### *Hydrastis.*

This starch is very abundant in the rhizome. The grains are sometimes single and rounded, more commonly with one or more flat faces or aggregated in masses of from two to six or more grains. The hilum is central, usually inconspicuous and unfissured, and no stratification curves are observable. No distinct polarisation cross is visible.

### *Caulophyllum.*

This starch, though very minute grained, is nevertheless quite characteristic, owing to the way the granules are aggregated. The isolated granules are globular, or much more commonly many-sided, and without evident hilum or markings of any kind, but they are mostly aggregated in nearly globular masses of from twenty-five to fifty granules. The grains do not polarise.

### *Cimicifuga.*

This starch is rather abundant in the rhizome, and consists of grains of moderate size, which are sometimes nearly round, but more commonly angular, or obtusely many-sided and single or aggregated in masses of from two to eight or ten grains. The hilum is central or subcentral, rarely with a small straight or angular fissure. No lines of stratification are observable, except very faintly on the largest grains, and then not more than one or two can be detected. Polarisation cross nearly rectangular and equal-armed.

### *Menispermum.*

This starch is neither very abundant nor very characteristic. It occurs chiefly in the outer portion of the pith in the soft medullary rays and in the middle bark. The grains are globular, or with one or more flattish sides; most commonly single, but sometimes double or triple; hilum central, inconspicuous, and unfissured. No stratification lines are observable, and no polarisation cross.

### *Leptandra.*

The starch occurs in moderate quantity in the rhizome, and consists of isolated globular or angular grains mixed with those which are massed in groups of from two to twelve grains. The hilum is central or subcentral, and distinctly observable in the larger grains, seldom fissured, but often marked by a rather large, less refractive, rounded or angular area near the centre. On the larger grains one or two stratification curves are faintly observable. Polarisation cross nearly or quite rectangular and equal-armed. Freely sprinkled among the larger grains are minute, apparently structureless ones. If the starch of this drug be compared with that of cimicifuga a great similarity will be observed. The grains of the latter, however, average somewhat larger than the others, and the proportion of minute grains is not so great.

### *Jalap.*

This starch is abundant, large-grained, and quite characteristic. The grains are dense, rounded, or broadly ovate, with the hilum somewhat eccentric; they are mostly single, but sometimes double, in which case the two component granules are usually unequal; the hilum is sometimes, though rarely, slightly fissured, and in the larger grains is surrounded by a series of stratification curves. The polarisation cross is nearly rectangular usually, but very unequal-armed in the ordinary position of the grain.

### *Aconite.*

This drug is very rich in rather large-grained starch. The single grains are round, oblong, or often with one or more flat faces, but compound grains are quite common, and these range from double ones to those composed of eight or more granules. The hilum is central, sometimes faintly fissured in a radial manner, concentric markings indistinct or none, and polarisation cross nearly equal-armed and nearly rectangular in the simple grains. A specimen of Chinese aconite which was examined showed grains of similar shape and size, but with a less distinct polarisation cross, and with the stratification curves about the hilum much more distinct. The starch of *Aconitum ferox* is also very similar to that of the official drug. Certainly it would be very difficult, if not impossible, to distinguish the two drugs by the starches alone.

### *Colchicum.*

The corm usually contains starch in great abundance, and it is large grained and quite characteristic. Many grains are single and spherical, spheroidal, or present one or two flattish faces; many are double, triple, or quadruple, but all, even the smaller ones, are strongly stellately fissured through the central hilum. The rays of the fissures are often very numerous. The polarisation cross is rectangular and equal-armed, and the rays are broadest at the intersection of the arms.

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, SEPTEMBER 30, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## OPENING OF THE SCHOOL OF PHARMACY.

AT the opening of the Society's School of Pharmacy on Monday afternoon next, the sessional prizes and certificates will be presented to the successful students of last session, and an inaugural address will be delivered by Dr. T. LAUDER BRUNTON, F.R.C.P., F.R.S. The chair will be taken at three o'clock precisely. At the conclusion of the proceedings, the laboratories, museums, etc., in the Society's house will be open for the inspection of visitors, as usual.

## PROSECUTIONS UNDER THE PHARMACY ACTS.

IN the great majority of instances, the legal proceedings which the Council of the Pharmaceutical Society has occasion to institute, against persons infringing the provisions of the Pharmacy Acts, are settled by the offenders paying into Court the penalties to which they have rendered themselves liable. Under those circumstances it has been customary to abstain from publication of the facts that A. B. and C. have been called upon to pay penalties for breaking the law, and that they have done so without the cases being subjected to judicial inquiry and decision. It thus happens that, to a very large extent, the action taken by the Council in the administration of the Pharmacy Acts remains unknown beyond the Society's office, and, except from the periodical reports of the Solicitors to the Law and Parliamentary Committee, members have no intimation of what has been done towards enforcing the provisions of the Acts. Not long ago attention was called to this circumstance in the *British Medical Journal*, and the opinion was there expressed that, from the point of view of public interest, the results of all legal proceedings taken under the Pharmacy Acts should be fully published. The argument adduced in support of that view was to the effect that the provisions of the Pharmacy Acts, and especially those of the Act of 1868, were intended primarily for the protection of the public; that offences under the Act being consequently offences against the public, the names of offenders should be made known, not only in those cases which are decided by a court of law, but also in those which are settled before going into court by the voluntary payment of the penalties incurred.

We do not deny that from the particular point of view this argument is advanced there may be some reasonable ground for the opinion that full publicity should be given to the results of cases which do not come into court. But it is not only in its capacity in regard to the general public interest, that the Pharmaceutical Society is empowered by the Pharmacy Acts to take proceedings against persons who infringe their provisions. In a recent editorial note in the *British Medical Journal* it is pointed out that the Society, in exercising the powers conferred upon it by the Pharmacy Acts, fulfils a twofold relation; first, the public duty of enforcing the provisions of the Acts in the interest of the general community, and secondly the duty of doing so for protecting the interests of the body represented by the Society. This latter function is spoken of by our contemporary as being a "privilege" conferred upon the Society in its capacity as representative of the persons qualified under the Acts. No objection can be made to that view of the matter, but it must also be admitted that the twofold capacity in which legal action is taken by the Society, in the administration of the Pharmacy Acts, entails a certain degree of reticence and a less uncompromising infliction of the pains and penalties of the law, than might be appropriate if the proceedings taken had solely the object of protecting the public. In fact, the administration of the Pharmacy Acts should be regarded as having for its object not so much the punishment of offenders as the prevention of offences against the Act. Action taken in that sense may be as effective, in regard to the interests of the public, as if it were attended with greater publicity, and it is only upon the presumption that the Society's duty in that respect is not fully performed that there would be any real ground for the contention of the *British Medical Journal* as to the publication of the names of persons who pay penalties for illegal practices, without offering any defence before a legal tribunal.

We do not suppose that it will be suggested by anyone that there is a want of regard for the public duty and responsibility cast upon the Pharmaceutical Society by the Pharmacy Act of 1868 in regard to the sale of poisons. It is rather in the opposite direction that there is a tendency to find fault, but as that is manifested by the persons against whom it becomes the business of the Society to take legal proceedings, the reason for their complaint is self-evidently a very natural one. The cases tried last week at Edinburgh are sufficient to prove that on various grounds it is imperative that the Society should institute prosecutions. For that reason we publish this week a full report of these cases, which are very instructive also in regard to the difficulties to be contended with in enforcing the law relating to the sale of poison. It will be seen in the first place that though decisions in favour of the Society are obtained, even that result is often attended with considerable expense, which has to be borne by the Society, far in excess of the penalties inflicted and the allowances made for legal expenses. In that respect the work done by the Society is done on behalf of the whole body of registered chemists and druggists, and it is done at the cost of the proportionately small number of them who are directly connected with the Society. We say directly connected to indicate those who, as members or associates, contribute to the funds of the Society, for in reality every chemist and druggist on the register is connected with the Pharmaceutical Society, whether or not he recognises his relationship and shows his appreciation of the advantages arising from incorporate representation by performing his part as a unit of the organisation.

Taking the evidence given at the trials it appears that there is still much ignorance of the Pharmacy Act and of its provisions. After the numerous prosecutions that have been instituted it is surprising to find drysalters pleading ignorance of the fact that they cannot lawfully sell poisons included in the schedule to the Act. It is still more strange that persons who have on more than one occasion failed to pass the examination, by which qualification to sell or dispense poisons is obtainable, should declare their belief that they can, without that legal qualification, do either one or the other, and not subject themselves to the penalties prescribed by the Act. It is satisfactory, however, to find that the judge who heard the cases, while showing every consideration for the defendants who were not represented by solicitors or counsel, was fully alive to the public importance of the Act, and that he recognised the necessity of enforcing its provisions.

## LONDON WATER SUPPLY.

In the report just published by the Royal Commission appointed to inquire into the water supply of the metropolis, the statement is made that the water question has passed from the domain of chemistry into that of biology, as a result of the comparatively recent discovery that the matter, to the presence of which water owes its occasional power of disseminating infectious diseases, is living matter, consisting of minute vegetable organisms. Though these microbes are ubiquitous, it is pointed out that, fortunately, the vast majority of them are perfectly innocuous, and, moreover, even serve useful or necessary purposes, by breaking up dead animal and vegetable matter, and reducing it to its inorganic constituents. Many of them, too, act as actual preventives of infectious disease by destroying pathogenic forms. As regards the latter, though there is a practical certainty that some of them, given off by sick persons dwelling in the neighbourhood of rivers, will find their way into the water, it is claimed by experts that the proportion entering the Thames and the Lea is infinitesimal, and that it is extremely doubtful whether a single pathogenic microbe will remain in the water as delivered to the consumer, or even in the unfiltered river water itself, since destruction or elimination of the various forms occurs during the sojourn of the water in the subsidence tanks. Further, even assuming that a few pathogenic bacteria might gain entrance to the service pipes, though this is extremely improbable, they could not possibly be present in sufficient numbers to give rise to disease. In commenting upon these arguments, the Commissioners remark that bacteriology is still in its infancy, and, though the results obtained deserve full consideration as possessing a high degree of probability, it would be rash as yet to dispense with the evidence of experience which must still be the main guide. This, however, according to the report, may be regarded as practically confirming the opinions of experts in bacteriology, since the general rule appears to be that an infectious disease, such as cholera, does not make its way down the rivers as it spreads over the country, but travels in the contrary direction, the facts being therefore manifestly incompatible with the hypothesis that infection is usually carried from one town to another by means of the water supply. The conclusion ultimately arrived at is that there is no evidence that the water supplied to consumers in London by the companies is not perfectly wholesome, and it is noted that not a single instance can be adduced in which an outbreak of disease has occurred in London through infection conveyed by water stored in domestic cisterns.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

We are asked to announce that the first meeting of this Association, for the coming session, will be held at 8.30 p.m., on Thursday, October 5, at 103, Great Russell Street, W.C. The inaugural address will be delivered by the President, Mr. E. F. Harrison, at 9 o'clock, and all assistants and others connected with pharmacy are invited to be present.

## BIBLIOGRAPHY OF CHEMISTRY.

Under the auspices of the Smithsonian Institution, Washington, U.S.A., a select bibliography of chemistry has been published. This covers a period of four hundred years from 1492, and has been compiled by Mr. Henry Carrington Bolton. The volume serves as a general index to chemical works published in English (British Isles and America), Dutch, Danish, Norwegian, Swedish, Italian, Portuguese, Spanish, Hungarian, Russian, Polish, Bohemian, and other Slavonic languages. There are seven sections into which the work is divided:—1, Bibliography; 2, Dictionaries; 3, History; 4, Biography; 5, Pure and Applied Chemistry; 6, Alchemy; 7, Periodicals. Except in the fourth and last sections, the titles of books referred to are arranged alphabetically according to authors. Biographical works are arranged according to the names of the persons described, with cross-references to the authors.

# Transactions of the Pharmaceutical Society.

## MAJOR EXAMINATION QUESTIONS.

## (LONDON AND EDINBURGH).

*September* 26, 1893.

### PHYSICS.

*Time allowed, Three hours.*

1. Explain fully, with diagrams, what is meant by the terms *spherical aberration* and *chromatic aberration*. How are these defects corrected?

2. Describe and explain fully the construction and use of the gold leaf electroscope and the condensing electroscope.

3. Explain how rods of soft iron and steel differ from each other in their magnetic properties, and describe experiments by which you would demonstrate the fact.

4. Describe in detail the method you would adopt to determine the numerical value of the latent heat of water.

5. A certain mass of air measures 400 C.c. at 10° C. and 750 Mm. pressure. At what temperature will it measure a litre, if the pressure is 760 Mm.?

### CHEMISTRY.

*Time allowed, Three hours.*

1. Describe minutely, with a sketch of the apparatus, the process you would adopt for the preparation and preservation of a small quantity of ethyl chloride. What are the characters of the compound, and how would you demonstrate that it contained chlorine?

2. Describe an experiment to illustrate the reduction of nitric acid to ammonia.

3. Give the method of preparation and important reactions of sodium thiosulphate. Discuss the theory of its constitution, noting particularly the valency exercised by each of its constituent elements.

4. Write a short paper on the chemistry of some of the principal hydroxy fatty acids, illustrating by equations general methods of preparation and decomposition.

5. It was found that 0·2 Gm. of desiccated potassium bromide, contaminated with chloride, required 17·2 C.c. of $\frac{N}{10}$ silver nitrate solution for complete precipitation. What percentage of potassium chloride did the salt contain? ($AgNO_3 = 170$, $KBr = 119·1$, $KCl = 74·5$).

*September* 27.

### BOTANY.

*Time allowed, Three hours.*

1. Give the chief characters of the natural order Scrophulariaceæ, and state how you would distinguish the genus Scrophularia from Mentha. Draw the floral diagrams. Enumerate the principal genera.

2. Define the terms phyllode, epiphyte, cladode, villous, glaucous, rugose, emarginate, retuse, and mucronate.

3. What do we mean by branching? What are the chief kinds of branch systems? Give examples. Define the umbel, the capitulum, and the spadix, giving examples.

4. Draw and describe the sections provided.

5. What is the function of the Cambium? What are its relative positions in the root and the stem? Describe the secondary increase in thickness of the stem of the Dracæna.

### MATERIA MEDICA.

*Time allowed, Three hours.*

1. Give in full the B.P. method for ascertaining the purity of Sulphate of Quinine. What limit of impurity is allowed?

2. How is Olive Oil obtained? What are the chief commercial varieties? Give tests for its purity, and state what they are intended to exclude. Mention its proximate chemical composition.

3. What is Absorbent Wool? How is it prepared? What is its chemical composition? How may it be distinguished from Lint?

4. How is Santonin prepared? Discuss its relations to an alkaloid and a glucoside. Give tests which shall distinguish it from Salicin and Strychnia.

5. What is Jalapin? How is it prepared? In what way does it differ from the Resin of Scammony?

6. In what substances is Eugenol found? Describe it.

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# The British Association for the Advancement of Science.

## ADDRESS TO THE CHEMICAL SECTION.

BY PROFESSOR EMERSON REYNOLDS, M.D., SC.D., F.R.S., PRESIDENT OF THE SECTION.

(*Concluded from page* 259.)

When silicon anilide is heated carefully *in vacuo* it loses one molecule of aniline very easily, and leaves triphenyl-guanidine, probably the *a* modification; if the action of heat be continued, but at ordinary pressure and in a current of dry hydrogen, another molecule of aniline can be expelled, and, just before the last trace of the latter is removed, the previously liquid substance solidifies and affords a silicon analogue of the insoluble modification of carbodiphenyldiimide, which may then be heated moderately without undergoing further material change. A comparison of the formulæ will make the relations of the products clear:—

Silicotetraphenylamide—$Si(NHPh)_4$.
Silicotriphenylguanidine—$Si:NPh.(NHPh)_2$.
Silicodiphenyldiimide—$Si:(NPh)_2$.

Moreover, the diimide has been heated to full redness in a gas combustion furnace, while dry hydrogen was still passed over it; even under these conditions little charring occurred, but some nitrogen and a phenyl radical were eliminated, and the purified residue was found to approximate in composition to SiNPh, which would represent the body as phenylsilicocyanide or a polymer of it. Even careful heating of the diimide in ammonia gas has not enabled me to remove all the phenyl from the compound, but rather to retain nitrogen, as the best residue obtained from such treatment consisted of $Si_2N_3Ph$, or the phenylic derivative of one of the substances produced by Schutzenberger and Colson from the ammonia reaction. It may be that both these substances are compounds of silicocyanogen with an imide group of the kind below indicated—

$$\begin{matrix}SiN\\SiN\end{matrix}\!>NH \quad : \quad \begin{matrix}SiN\\SiN\end{matrix}\!>NPh$$

Further investigation must decide whether this is a real relationship; if it be, we should be able to remove the imidic group and obtain silicocyanogen in the free state. One other point only need be noticed, namely, that when the above silicon compounds are heated in oxygen they are slowly converted into $SiO_2$; but the last traces of nitrogen are removed with great difficulty, unless water-vapour is present, when ammonia and silica are quickly formed.

Much remains to be done in this department of comparative chemistry, but we may fairly claim to have established the fact that silicon, like carbon, can be made to form perfectly well-defined compounds in which it is exclusively united with the triad nitrogen of amidic and imidic groups.

Now, having proved the capacity of silicon for the formation of compounds of this order with a triad element, Nature very distinctively lets us understand that nitrogen is not the particular element which is best adapted to place the triad *rôle* towards silicon in its high-temperature changes, which are ultimately dominated by oxygen. We are not acquainted with any natural compounds which include silicon and nitrogen; but large numbers of the most important minerals contain the pseudo triad element aluminium combined with silicon, and few include any other triad. Phosphorus follows silicon in the periodic system of the elements as nitrogen does carbon, but silicates containing more than traces of phosphorus are rare; on the other hand, silicates are not uncommon containing boron, the lower homologue of aluminium; for example, axinite, datholite, and tourmaline.

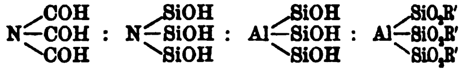
Moreover, it is well known that silicon dissolves freely in molten aluminium, though much more of the former separates on cooling. Winkler has analysed the gangue of aluminium saturated with silicon, and found that its composition is approximately represented by the formula SiAl, or, perhaps, $Si_2Al_2$, if we are to regard this as analogous to $C_2N_2$ or cyanogen. Here aluminium at least resembles nitrogen in directly forming a compound with silicon at moderately high temperature. It would appear, then, that while silicon can combine with both the triads nitrogen and aluminium, the marked positive characters of the latter, and its extremely low volatility, suit it best for the production of permanent silicon compounds similar to those which nitrogen can afford.

With these facts in mind we may carry our thoughts back to that period in the earth's history when our planet was at a higher temperature than the dissociation point of oxygen compounds. Under such conditions the least volatile elements were probably liquids, while silicides and carbides of various metals were formed in the fluid globe. We can imagine that the attraction of aluminum for the large excess of silicon would assert itself, and that, as the temperature fell below the point at which oxidation became possible, these silicides and carbides underwent some degree of oxidation, the carbides suffering most owing to the volatility of the oxides of carbon, while the fixity of the products of oxidation of silicides rendered the latter process a more gradual one. The oxidation of silicides of metals which had little attraction for silicon would lead to the formation of simple metallic silicates and to the separation of the large quantities of free silica we meet with in the solid crust of the earth, whereas oxidation of silicides of aluminium would not break up the union of the two elements, but rather cause the ultimate formation of the alumino-silicates which are so abundant in most of our rocks.

Viewed in the light of the facts already cited and the inferences we have drawn from them as to the nitrogen-like relationship of aluminium to silicon, I am disposed to regard the natural alumino-silicates as products of final oxidation of sometime active silico-aluminium analogues of carbo-nitrogen compounds, rather than ordinary double salts. It is generally taken for granted that they are double salts, but recent work on the chromoxalates by E. A. Werner has shown that this view is not necessarily true of all such substances.

Without going into undue detail we can even form some conception of the general course of change from simple aluminium silicide to an alumino-silicate, if we allow the analogies already traced to lead us further.

We recognise the existence of silico-formyl in Friedel and Ladenburg's silico-formic anhydride; hence silico-triformamide is a compound whose probable formation we can admit, and, on the basis of our aluminium-nitrogen analogy, an aluminium representative also. Thus—

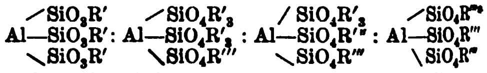


$$\mathrm{N}\begin{matrix}\diagup\mathrm{COH}\\ -\mathrm{COH}\\ \diagdown\mathrm{COH}\end{matrix} : \mathrm{N}\begin{matrix}\diagup\mathrm{SiOH}\\ -\mathrm{SiOH}\\ \diagdown\mathrm{SiOH}\end{matrix} : \mathrm{Al}\begin{matrix}\diagup\mathrm{SiOH}\\ -\mathrm{SiOH}\\ \diagdown\mathrm{SiOH}\end{matrix} : \mathrm{Al}\begin{matrix}\diagup\mathrm{SiO_2R'}\\ -\mathrm{SiO_2R'}\\ \diagdown\mathrm{SiO_2R'}\end{matrix}$$

Triformamide. Silico-triformamide. Silico-alumino-triformamide. Salt of an alumino-silicic acid.

Now, oxidation of triformamide would lead to complete resolution into nitrogen gas, carbondioxide gas and water rendering it an extremely unstable body; under similar conditions silico-triformamide would probably afford nitrogen gas and silicic acid (or silicon dioxide and water); while the third compound, instead of breaking up, would (owing to the fixity of aluminium as compared with nitrogen) be likely at first to afford a salt of an alumino-silicic acid, in presence of much basic material.

The frequent recurrence of the ratios $Si_3Al$, $Si_3Al_2$, etc., in the formulæ of natural alumino-silicates, suggests that some at least of these minerals are derived from oxidation products of the above triformic type. Without stopping to trace all the possible stages in the oxidation of the primary compound $Al(SiO_2R)_3$, or variations in basicity of the products, I may cite the four following examples out of many others which might be given of resulting representative mineral groups:—



$$\mathrm{Al}\begin{matrix}\diagup\mathrm{SiO_3R'}\\ -\mathrm{SiO_3R'}\\ \diagdown\mathrm{SiO_3R'}\end{matrix} : \mathrm{Al}\begin{matrix}\diagup\mathrm{SiO_4R'_3}\\ -\mathrm{SiO_4R'_3}\\ \diagdown\mathrm{SiO_4R'''}\end{matrix} : \mathrm{Al}\begin{matrix}\diagup\mathrm{SiO_4R'_3}\\ -\mathrm{SiO_4R'''}\\ \diagdown\mathrm{SiO_4R'''}\end{matrix} : \mathrm{Al}\begin{matrix}\diagup\mathrm{SiO_4R'''^{*}}\\ -\mathrm{SiO_4R'''}\\ \diagdown\mathrm{SiO_4R'''}\end{matrix}$$

Beryl type (hemi-). Garnet type. Muscovite type Xenolite type.

Five years ago Professor F. W. Clarke, of the United States Geological Survey, published a most interesting paper on the structure of the natural silicates. In this he adopts the view that the mineral xenolite, $Si_3Al_4O_{12}$, is the primary from which all other alumino-silicates may be supposed to arise by various substitutions. Nature, however, seems to teach us that such minerals as xenolite, fibrolite, and the related group of "clays" are rather to be regarded as end-products of a series of hydrolytic changes of less aluminous silicates than primary substances themselves; hence the sketch which I have ventured to give above of the probable genesis of alumino-silicates seems to provide a less arbitrary basis for Clarke's interesting work, without materially disturbing the general drift of his subsequent reasoning.

We may now consider for a moment in what direction evidence can be sought for the existence in nature of derivatives of the hypothetical intermediate products of oxidation between a primary silicide and its fully oxidised silicate.

In the absence of a working hypothesis of the kind which I have already suggested it is not probable that direct evidence would yet be obtainable—this must be work for the future—but when we consider that the existence of compounds of the order in question would manifest themselves in ordinary mineral analyses by the analytical products exceeding the original weight of material, we seem to find some evidence on the point in recorded cases of the kind. A deficiency of a single atom of oxygen in compounds having the high molecular weights of those in question, would be indicated by very small excesses (from 2 to 3 per cent.) whose real meaning might be easily overlooked. Now, such results are not at all unusual in analyses of mineral alumino-silicates. For instance, *Amphiboles* containing a mere trace of iron have afforded 102·75 parts from 100, and almost all analyses of *Microsommite* are high, giving as much as 103 parts. In less degree *Vesuvianite* and members of the *Andalusite* group may be noted. All these cases may be capable of some other explanations, but I cite them to show that such excesses are commonly met with in published analyses. On the other hand, it is scarcely to be doubted that a good analyst, who obtained a really significant excess, would throw such a result aside as erroneous and never publish it. I therefore plead for much greater care in analyses of the kind in question, and closer scrutiny of results in the light of the suggestions I have ventured to offer. It is probable that silicates containing only partially oxidised aluminium are rare; nevertheless the search for them would introduce a new element of interest into mineralogical inquiries.

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* In these cases where $R'''$=Al it is, of course, assumed that the latter is acting only as a basic radical.

If the general considerations I have now endeavoured to lay before you are allowed their full weight, some of the alumino-silicates of our primary rocks reveal to us more than we hitherto supposed. Regarded from this newer standpoint, they are teleoxidised representatives of substances which foreshadowed in terms of silicon, aluminium, and oxygen the compounds of carbon, nitrogen, and hydrogen required at a later stage of the earth's history for living organisms. Thus, while the sedimentary strata contain remains which come down to us from the very dawn of life on this globe, the rocks from whose partial disintegration the preserving strata resulted contain mineral records which carry us still further back, even to Nature's earliest efforts in building up compounds similar to those suited for the purposes of organic development.

# Provincial Transactions.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The Sheffield Pharmaceutical and Chemical Society has just appointed the officers for the current year, and a number of interesting papers having been promised, it is believed the session will be a very successful one. The officers, elected at the annual meeting held on Friday, the 22nd inst., are:—President, Mr. G. T. W. Newsholme; Vice-Presidents, Mr. S. T. Rhoden and Mr. H. E. Ibbitt; Treasurer, Mr. G. T. W. Newsholme; Hon. Secretary, Mr. J. F. Eardley; Members of the Council the officers already named, and Messrs. J. H. Bradwall, G. Ellinor, A. R. Fox, C. O. Morrison, G. Owen, Job Preston, W. Ward, and R. Watts; Auditors, Messrs. R. W. Watson and G. Squire. The inaugural meeting and annual dinner are to be held on Thursday, October 12.

# Parliamentary and Law Proceedings.

## PROSECUTIONS UNDER THE PHARMACY ACT.

### BREMRIDGE *v.* MURDOCH AND OTHERS.

The cases of Richard Bremridge, 17, Bloomsbury Square, London, W.C., Registrar under the Pharmacy Acts, 1852 and 1868, with the concurrence of Robert Laidlaw Stuart, Procurator Fiscal of Midlothian, *versus* John T. Murdoch, James Logan, James Johnston, Alexander Simpson, and Robert C. Hunter, were heard before acting Sheriff Sym at the Sheriff Court House, George IV. Bridge, Edinburgh, on Thursday, September 21.

Mr. Peter Morison, S.S.C., appeared for the complainer, Mr. William Green, solicitor, 50, George Street, Edinburgh, appeared on behalf of the respondent, James Logan. The other respondents appeared on their own behalf.

*Complaint against John T. Murdoch.*

The respondent was charged with having, in the shop occupied by the Scottish Drug Depôt, Limited, at 49, Leith Walk, Leith, on July 15, 1893, sold a quantity of laudanum to Joseph Tait, also with having sold a quantity of opium and a quantity of chloroform to Thomas Allan on July 18, 1893, and also with having sold a quantity of laudanum to Joseph Tait on July 18, 1893.

The complaint having been read over,

Sheriff Sym, addressing respondent, said: You are charged with three offences against this Act. What have you to say?

The Respondent: I was engaged as dispenser eight months ago, and during these eight months there have been four managers put above me. I was not to know whether they were qualified or not. I was making up prescriptions under the idea that there was a qualified manager above me.

Sheriff Sym: Are you a qualified chemist and druggist, and registered as such?

The Respondent: No.

Sheriff Sym: I will hear the case.

*Evidence for Complainer.*

John Rutherford Hill, sworn and examined by Mr. Morison.—I am Assistant Secretary in Scotland to the Pharmaceutical Society. I have a copy of the Register of Chemists and Druggists and Pharmaceutical Chemists under the Act, and produce it. [Register put in and marked No. 1.] I know Murdoch, the respondent; his name is not on the Register. I am a pharmaceutical chemist and accustomed to make analyses of poisons; it is part of my regular duties. [Shown bottle, marked No. 2.] I got that from Joseph Tait, who is a witness here to-day; on Saturday, July 15, I analysed the contents, and found it to contain laudanum, or tincture of opium. I then tied it up in this form, sealed it, and attached this docket, which was signed by myself, and by the witnesses Thomas Allan and Joseph Tait. [Shown bottle, marked No. 3.] I got that from Thomas Allan on Tuesday, July 18. I analysed it, and found that it contained opium and chloroform. I then tied it up, and attached this docket to it, which was signed by the same three witnesses, that is, by myself and by Allan and Tait. The contents of this bottle were supplied from a prescription which I furnished; it is for tincture of opium and liniment of chloroform, and I now produce it.

Sheriff Sym: You gave that prescription before the bottle was got?

Witness: Yes; I gave this prescription to Thomas Allan, and sent him to have it dispensed.

Examination continued.—He brought back the bottle, which is marked No. 3. [Prescription put in, and marked No. 4.] And the contents of the bottle are practically what is in this prescription. It contains two poisons—opium and chloroform. [Shown bottle, marked No. 5.] I got that from Joseph Tait on Tuesday, July 18. I analysed it and found it to be laudanum or tincture of opium, which is a poison within the meaning of the Act. I sealed it up and attached the docket to it, which was signed by the same witnesses. All these poisons are dangerous poisons.

Sheriff Sym, to respondent: Do you wish to ask the witness any questions?

The Respondent: I should like to state that in a chemist's line of business if there is a qualified manager kept in the shop, a party as dispenser does not need to be qualified.

Sheriff Sym: I understand that to be your line of defence. It does not require you to ask this witness any questions?

The Respondent: No.

Joseph Tait, sworn and examined by Mr. Morison.—I am fifteen and a half years old; I reside at 21, Oxford Street, and am a clerk in the office of the Pharmaceutical Society in Edinburgh, and have been so for about two years. I know the shop, 49, Leith Walk; it is occupied by the Scottish Drug Depôt, Limited. I called there on July 15 last. [Shown No. 2.] I called and got the contents of that bottle. The date was noted at the time on that card, and I recollect signing it. Thomas Allan was with me when I went to the shop; he is a witness here today. I asked for twopence worth of laudanum from the respondent; I identify him as the person I saw. He went to the back shop and took down a bottle and poured some of what was in it into the small bottle, and gave it to me, and I paid him 2*d*. for it, and took the bottle to Mr. Hill. [Shown No. 5.] I got that bottle on July 18.

Mr. Morison: I do not think there is any dispute about the facts.

The Respondent: No.

Examination continued.—I went and saw Murdoch the same as before. He poured laudanum out of a big bottle, the same as formerly, and handed it to me, and I paid him twopence for it, and gave it to Mr. Hill to be analysed, and I signed the label. [Shown No. 3.] I was present when that was purchased by Allan. I went to the shop along with Allan on July 18, and saw that Allan had a prescription with him. I saw him hand the prescription to Murdoch, and I saw Murdoch hand him the bottle which I have in my hand, and I signed the label.

Sheriff Sym (to respondent): Would you like to ask the witness any questions?

The Respondent: No.

Sheriff Sym (to witness): Was Murdoch the only person in the shop?

Witness: Logan was there the second time.

Thomas Allan, sworn and examined by Mr. Morison: I am a marble cutter, and reside at No. 4, George Place, Leith Walk. I recollect on July 15 going with the witness Tait to the shop at 49, Leith Walk, occupied by the Scottish Drug Depôt, Limited. I saw Murdoch in the shop then. [Shown No. 2.] I saw Tait purchase that from Murdoch on July 15, and pay him for it. I signed the label immediately after. I was at one time in the office of the Pharmaceutical Society for a number of years, and know that it is laudanum that is in the bottle, and I saw it analysed. [Shown No. 3.] I purchased that at the same place on July 18 from the accused, and took it to Mr. Hill the same day. I saw him analyse it, and I signed the label. [Shown No. 5, bottle of laudanum.] On July 18 I saw the witness Tait purchase that from Murdoch, and I signed the label in the same way as before. [Shown prescription marked No. 4.] That is the prescription that No. 3 is made from.

Respondent stated that he did not wish to ask the witness any questions.

Complainer's evidence closed.

Sheriff Sym to respondent: Are you going to lead evidence?

Respondent: I have two witnesses here. I would like to let you know that it is customary in chemists' shops, when there is a qualified manager——

Sheriff Sym: You had better call your witnesses, and explain your case afterwards to me.

Respondent: I cited Mr. Young, the present manager at 49, Leith Walk, but he has not appeared.

Sheriff Sym: Do you want to oblige him to come?

Respondent: Yes, I wish him very much to come?

Sheriff Sym: Can you finish your case without him?

Respondent: It depends on what is said against me.

Sheriff Sym: You have heard all the evidence led. At the end I will consider about your getting an adjournment.

*Respondent's Evidence.*

James Rae Murdoch, sworn and examined by respondent: You are a student, and reside at 27, East Preston Street?—Yes.

You are my brother?—Yes.

Mr. Morison: I am told the manager of the Scottish Drug Depôt is here.

Respondent: Yes, the manager has come.

Examination continued.—I wish to ask you if I did not leave the Scottish Drug Depôt on June 19, and whether I was not out of work for three weeks because they had not a qualified man in the place?—I know that you were out of work for three weeks, and I also understand from you that the main reason was that there was not a qualified man, and that you did not agree with the man who was there.

Mr. John Corstorphine, baker and confectioner, 79, Great Junction Street, Leith: As Chairman of the Company, might I be allowed to say that an assertion has been made against the Company which is grossly untrue?

Sheriff Sym: You cannot be heard just now. You may have an opportunity afterwards of speaking.

Robert John Young, manager of the Scottish Drug Depôt, Limited, sworn and examined by respondent: Where do you reside?—At 6, North Drum Place, Easter Road.

You understand I was away from 49, Leith Walk, for three weeks?—You were away when I went there. I was told you were away three weeks.

Sheriff Sym: Are you a qualified chemist and druggist, and registered?—Yes.

Are you with the Scottish Drug Depôt just now?—Yes.

Examination continued.—You came, I think, about June 19, to the Scottish Drug Depôt?—I cannot tell you from memory, but I have the date here (referring to note-book). I took charge of the Leith Walk shop on the morning of Tuesday, June 27.

You were on for the Tollcross branch for a fortnight or three weeks before that?—No, I was never in the employment of the firm before that.

You came on June 27?—That was the first day I ever worked for the Scottish Drug Depôt.

You were not long there?—I was there till July 10.

You know there was no qualified man in the Leith Walk shop during that time?—During my absence.

You know that I was away for most of that time?—No, I was under the impression that you were there.

Sheriff Sym: You were a qualified man in charge of the Leith Walk branch; from what date to what date?—On the first occasion from June 27 until Saturday, July 8.

On Saturday, July 8, did you go away for a period?—On Monday, the 10th, I left to take charge of the Tollcross shop.

During the time you were there till July 8, was Murdoch there?—No, he was not there at all.

When you left, was there any registered chemist and druggist in the place?—No, not to my knowledge. I was never in the shop during that period.

You were away till when?—I took charge of the Leith Walk shop again on July 24. In the interval I was at Tollcross.

And then you took charge of the Leith Walk shop on July 24?—Yes.

Are you sure of that?—Yes.

You were absent from the 8th to the 24th?—I was there from the morning of Tuesday, June 27, to July 10 in the first instance, and then I went to Tollcross for a fortnight, and I have been back ever since.

Examination continued.—You have heard it stated that I left because there was not a qualified man there?—No, I cannot say I am aware of that. The only person I ever heard speak of the reason of your leaving was yourself.

Sheriff Sym: When you were there was he in the employment of the Company?—Not when I first came.

Up till you left the Leith Walk shop for the first time, on July 8, was he in the Leith Walk shop?—No, I never saw him.

You were never in the Leith Walk shop while you were in Tollcross?—Not on business, but I think I went in for a few minutes one day to see how they were getting on.

What staff had you in Leith Walk shop when you were there the first time?—An assistant and a boy.

An assistant to dispense under your orders?—Yes, an unqualified assistant and a boy.

When you returned was the staff the same?—When I returned there were two there. Mr. Murdoch was there when I returned, and there was another one besides.

Did you give him orders when you returned?—Yes.

Sheriff Sym, to respondent: This witness does not speak to the dates complained of.

Cross-examined by Mr. Morison: I think you said your full name was Robert John Young?—Yes.

Where do you live?—At 6, North Drum Place, Edinburgh, at present.

Why do you say you are on the register?—I am under the impression that I am; I am qualified, and if my name is off, it is without my knowledge. It must have been through my change of address.

I show you the register; you cannot find your name there?—My name is not there, but it ought to be; I can produce my certificate.

Sheriff Sym: Have you your certificate in Edinburgh?—Yes, it is in my house.

Cross-examination continued.—There was no qualified man in this shop during the time that you were away?—Not to my knowledge.

They carry on a large business in that shop?—A fairly large business.

Selling all sorts of poisons?—The general run of a drug store.

Do you devote your exclusive attention to that shop?—Yes, my exclusive attention at the present time.

When did you begin to devote your exclusive attention to it?—For the fortnight before I went to Tollcross, and ever since.

Who was attending to Tollcross when you were in Leith Walk?—There was a qualified man there, Mr. Lee, I believe his name was. I do not know his christian name. He was there when I came to Leith Walk first.

Who was in the Nicolson Street shop at this period in July?—I fancy Mr. Dickson was there.

Were you not going back and forward about the shops?—No, certainly not; that is the only other shop that I ever was in.

Is it not Ewen MacDonald who is in the Nicolson Street shop?—There is a Mr. MacDonald there; I do not know his christian name.

Is that the person you say is the qualified man there?—No, at the time you speak of it was Mr. William S. Dickson.

At all events you were not in the shop from July 10 till 24?—That is so.

Mr. Corstorphine: Might I be allowed to ask a question?

Sheriff Sym: At present you are not in the case.

Mr. Corstorphine: I object to the Company being dragged into this matter. We ought to be represented by counsel. We are perfectly innocent in the matter.

Sheriff Sym: This is not a prosecution against you, and nothing can be done to you. It has the appearance of being injurious to you, but you are not represented. Have you made any effort to be represented?

Mr. Corstorphine: We expected Mr. Galbraith Miller to be here.

Sheriff Sym: Probably Mr. Miller would have watched the case for you, but I do not think I would have allowed him to ask questions. I think I quite understand your position.

The Respondent was then sworn, and gave evidence in his own behalf: I just wish to say that it is the general practice in drug companies that a dispenser is kept, and that he does not need to be qualified. During the eight months I have been with the Scottish Drug Depôt I have had four managers set over me. I had not time to look into their characters to ascertain whether they had passed their examinations or not. As dispenser, I do not think I was guilty in selling poison as long as I thought a qualified man was in the shop.

Sheriff Sym: That is really the question to be argued.

Respondent: Just so. That is all I have to say.

Sheriff Sym: Have you read the Act?

Respondent: Yes.

Sheriff Sym: Would you like to say anything to me about the case? Your view is just that you cannot be convicted, on the ground that you were a dispenser only?

Respondent: Just so.

Sheriff Sym: And that your employers had a qualified man put over you in the matter?

Respondent: Yes.

Sheriff Sym: That is a question of law.

Respondent's evidence closed.

Mr. Morison: I do not think that there is really any dispute as to the facts in this case. It is admitted that these poisons were sold by this man, and it is admitted that he is not qualified. It has been proved that there was no qualified man in that shop during the period embraced in this complaint.

Sheriff Sym: So far as Mr. Young knows; that is all the evidence about it.

Mr. Morison: At all events, it is not alleged that there was one. Now, this gentleman says that he was a dispenser. I don't know what he means by that exactly, but for an unqualified man to dispense poisons is just as bad as to sell them, because the words of the Act are:—that "from and after December 31, 1868, any person who shall sell or keep an open shop for the retailing, dispensing, or compounding of poisons," if he is not qualified, and so on. Now your lordship will see that the policy of the Act would be infringed just as much by an unqualified man dispensing poisons as by selling them, perhaps even more so. In one case which I had before the court, there was a prescription where certain quantities of poisons nicely adjusted had to be put into the medicine, and for an unqualified man to do that was just as bad, or even worse, than for an unqualified person to sell the poison after it was compounded and dispensed; the injury done to the public might be greater by the one person than by the other. Now your lordship knows that this Act was passed for the protection of the public, and I am here for the protection of the public alone. There are certain poisons sold to the public that are dangerous, which are scheduled in the Act, and this is one of them. We have had several prosecutions. On some occasions I did not ask for full penalties because the persons accused pleaded ignorance of the law. Now those persons, however, who were breaking the law ought to be made aware that they could not do so with impunity. They have had sufficient warning now. You will see that the Act does not give your lordship power to modify the penalty; it is a penalty of £5, and there is nothing but a penalty of £5.

Sheriff Sym: How did you modify that before?

Mr. Morison: I am dealing with the Pharmacy Act. But I brought my complaint under the Summary Prosecutions Act.

Sheriff Sym: I see.

Mr. Morison: If I had not brought my complaint under the Summary Prosecutions Act, but had done as they do in England — just brought an action for the penalty in the Sheriff Ordinary Court—your lordship would have had no power to modify the penalty, and in England the full penalty is invariably given. I would also point out to your lordship that the Act entitles me to get full expenses, not merely what is generally known as judicial expenses, but the full expenses of the prosecution. I mention that because there is nothing but poinding, there is no imprisonment, and the policy of the Act is to prevent the infringement of it by a pecuniary consideration, and by that alone. I have chosen to adopt the Summary Prosecutions Act, which gives your lordship power to modify any penalty whatever. It also restricts the costs, but I say that in exercising your lordship's power of modifying the penalty you ought to take the provisions of the Pharmacy Act into consideration. I think you ought to take this further into consideration, that it is not one offence that has been committed by the accused—I think it has almost been proved that this sort of thing has been going on regularly for a fortnight. I think that is a very dangerous state of matters to exist in a shop doing a large business of that kind, and I think your lordship should give the full penalty in this case.

Sheriff Sym: Is it meant here that the accused has been keeping open shop for retailing poisons?

Mr. Morison: No, I do not charge him with keeping open shop.

Sheriff Sym: Is not the selling of poisons exegetical of keeping open shop?

Mr. Morison: No, and I would refer your lordship to the case of the London and Provincial Supply Association. In that case the House of Lords decided that you could not proceed against the Society keeping open shop, but would require to go against the actual person who sold the poison. I had a case against the Scottish Drug Depôt in 1887, where the same point was raised, namely, that you cannot go against the Corporation. It was the case of Bremridge *v.* Gray and others.

Sheriff Sym: I had better look at it before I decide this case. [To respondent.] I understand that your defence is that you were not acting as a person who sells or keeps open shop at all, but as a servant?

Respondent: Yes. It is not like as if I was trying to evade the Pharmacy Acts. I have failed twice to get through my examination, and I must go to work to get money in some way.

Sheriff Sym: That is not what I was putting to you. What I was suggesting to you was that perhaps you wish to argue that you are not a person who sells or keeps open shop, because you are only there as a hand acting under orders?

Respondent: There is no question about it.

Mr. Morison: A person could sell without keeping open shop.

Sheriff Sym, to Mr. Morison: You had better get me the House of Lords Report, and I will hear the other cases before deciding this one.

### *Complaint against James Logan.*

The respondent was charged with having, in the shop occupied by the Scottish Drug Depôt, Limited, 49, Leith Walk, Leith, sold a quantity of opium and a quantity of chloroform to Thomas Allan, and also with having sold a quantity of laudanum to Joseph Tait, both on July 19, 1893.

The complaint having been read over, the respondent pleaded not guilty.

### *Evidence for Complainer.*

John Rutherford Hill, sworn and examined by Mr. Morison: I produce the register of chemists and druggists and pharmaceutical chemists. [Register produced and marked No. 1]. James Logan's name is not on the register. [Shown No. 2.] I got that bottle from Joseph Tait, one of the witnesses, on Wednesday, July 19. The witness Allan was along with him. I analysed the contents of this bottle, and found it to be laudanum, which is a preparation of opium. I attached this label and sealed it, and the two witnesses signed it along with me. [Shown prescription No. 3]. That prescription is in my handwriting. I sent Thomas Allan and Joseph Tait with the prescription to the shop 49, Leith Walk, to have it dispensed, and they brought back the bottle which I now produce. [Bottle put in and marked No. 4.] That was on Wednesday, July 19. I analysed the contents and found it to contain opium and chloroform, which are poisons within the meaning of the Act. I attached a label and got the two witnesses to sign it in the same way as in the other cases. I produce two receipts they brought back for the money payments, one bearing the letter "L" and the figure "9," and the other the letter "L" and the figure "2." These figures signify 2*d.* and 9*d.* [Receipts put in and marked Nos. 5 and 6.]

Cross-examined by Mr. Green.—I suppose it was you who sent Tait for the medicine?—Yes.

Did you send any more than Tait?—Tait and Allan.

They both went together?—Yes.

What time would it be about when you sent them?—Between one and two o'clock.

For both medicines?—Yes.

But they were at separate times?—Yes, one was purchased by Tait and the other by Allan.

They did not go in together?—No.

How do you account for the one label being marked "49, Leith Walk," and the other "Dalry Road?"—The Dalry Road label was upon the bottle when it was taken to the shop. The assistant who made the sale had failed to comply with the Act, in respect that he ought to have put on the bottle the address at which the sale took place, and he has not done so.

That is in regard to the laudanum?—Yes.

Sheriff Sym: Was it already on the bottle that you sent?—Yes, when it was sent to the shop.

Mr. Morison: You sent the empty bottle?—Yes.

Thomas Allan, sworn and examined by Mr. Morison [Shown prescription No. 3]: I got that from Mr. Hill. I took it down to the Drug Company at 49, Leith Walk. When I went in I saw Logan, the accused, and handed him this prescription. He asked me if I had a bottle, and I said no. He then went to the back shop and brought me the bottle of medicine, and I paid him 9*d.*, and he gave me a check marked with a "9." I saw him write that "L" and the "9" on the check. [Shown bottle, marked No. 4.] That is the bottle that he gave me on July 19. I gave it to Tait, and he took it up to Mr. Hill. I saw the contents analysed, and signed the label immediately after. On the same day I saw the witness Tait purchase the bottle marked No. 2. He purchased it immediately after I got the prescription from the accused. I signed the label in the same way.

Cross-examined by Mr. Green.—Is this the same prescription as was presented before to Mr. Murdoch?—The same prescription.

And you are sure that it was presented by you to Mr. Logan on Wednesday, July 19?—Yes.

When you went in what did you ask Mr. Logan?—I said I wanted "another bottle of that," handing him the prescription. He asked me if I had a bottle, and I said no.

He never asked anything about your name, or whom it was for?—No.

This is a different bottle from what you presented on the former occasion to Mr. Murdoch?—I do not say I presented that bottle to Mr. Murdoch.

I thought you presented it at one time, and then you presented it again to Mr. Logan?—I presented the prescription.

When you ordered the prescription where was Tait?—He was outside, at the door.

Do you know whereabouts he was?—I think he was standing on the pavement, pretty near the edge of the pavement.

He certainly was not in the shop?—No.

When you got the prescription dispensed did you see Tait at once?—Yes, I saw him outside.

You went away together?—Yes.

Did you say anything to him about having got it?—I told him I had got it.

And then Tait went in and ordered laudanum?—Yes.

Immediately?—Yes.

And you waited until he came out again?—Yes.

And you both went together to Mr. Hill?—No, he went to Mr. Hill alone.

Did Mr. Hill send you to the shop?—The witness Tait was to meet me.

Did he tell Tait to go to you specially and ask you to do this?—Mr. Hill explained to me the night before, or some other previous night, that he was going to send Tait down to me, and told me where I would meet him. I accordingly met him, and we both went down.

And Tait asked you to go in and get this prescription made up?—Yes.

Sheriff Sym: What is your object in asking these questions?

Mr. Green: I wish to ascertain whether he was sent by Mr. Hill's instructions.

Mr. Morison: That is admitted.

Re-examined.—You stood outside during the time that Tait was in?—Yes.

Did you see what was going on?—Yes.

You stood where you would see into the shop?—Yes.

Joseph Tait, sworn and examined by Mr. Morison: On July 19 I accompanied the witness Allan to the shop of the Scottish Drug Depôt in Leith Walk. Allan had a prescription with him. [Shown No. 3.] That is the prescription. I waited outside the shop, where I could see what was going on in the shop. I saw Allan hand the prescription to Logan. I saw Logan hand him a bottle in return. [Shown No. 4.] He got that bottle. Allan came out and showed it to me. I took it to Mr. Hill, and signed the label. Immediately after that I went in myself and saw Logan. I had a bottle with me on this occasion. [Shown No. 2.] That is the bottle. I asked for twopence worth of laudanum, and I saw him pour it into the bottle which he gave to me, and I paid him 2*d*., and showed it to Allan when I came out, and then took it to Mr. Hill, and he analysed it, and I signed the label.

Cross-examined by Mr. Green.—You are the boy who went on Wednesday, July 19, to the shop of the Scottish Drug Depôt at 49, Leith Walk, and bought laudanum?—Yes.

You went in company with another young man named Allan?—Yes.

And one stayed out while the other went into the shop?—Yes.

You went in after or before Allan?—After Allan.

You bought the laudanum?—Yes.

You are sure it was the accused who supplied you?—Quite sure.

Was there anyone else in the shop at the time?—No.

When you asked for the laudanum did Logan put any questions to you?—He went to the end of the counter, and then turned and asked who it was for. I told him it was Allan, 4, George Place.

Did he ask any more questions?—He said he was not allowed to sell poisons, and the dispenser was out. I told him I had got it before, and he asked when, and I told him about a fortnight before that. We had got it several times in the shop. Then he went to the back shop and took down a big bottle, and poured some of it into the small bottle.

You saw him pouring it in?—Yes.

He never said anything more after he handed you the laudanum; that was all that passed between you?—Yes.

Do you know if the other witness saw you purchasing it?—I expect he would see me.

But you are not sure?—No.

He did not tell you that he had seen you?——

Sheriff Sym (to witness): Do not answer that.

Allan was outside looking in at the door?—He was on the other side of the street, I think, but I am not sure.

This was on July 19, was it not?—Yes.

When had you got it before?—I had got it a fortnight before.

Mr. Green (through the Sheriff): Were you instructed to go to any other shop of the company when you asked for the laudanum, and Logan said he was not allowed to sell it?—No.

Mr. Green: I believe there are instructions given to all the shops to the effect that, in the event of a qualified man not being at hand, they are to send intending purchasers to the next shop where they would be supplied.

Sheriff Sym: You have got it that Logan said he was not allowed to sell poisons.

Re-examined.—It is quite true that you bought laudanum about a fortnight before?—Yes.

From whom?—From Logan.

Did he make any objections on that occasion to selling it?—No.

Had you bought it on more than one occasion in that shop?—I just bought it once before in addition to these two times.

Mr. Green objected to this line of inquiry.

Sheriff Sym: It was your question that brought it out.

Complainer's evidence closed.

Sheriff Sym (to Mr. Green): Are you going to lead evidence.

Mr. Green: I was proposing to bring one or two witnesses to show the working of the company and the rules. The accused denies what is alleged against him. It is some considerable time ago, and personally he knows nothing about the matter.

Sheriff Sym: It would be evidence against him to prove that there are certain orders of the company and that he does not act according to them. I will hear your evidence. This man has been charged with an offence, and are you going to prove that what was done was contrary to the instructions of his employers?

Mr. Green: I know he holds that he stuck to the rules of the company rigidly. I have proof as to the prescription.

### *Respondent's Evidence.*

John McDonald, sworn and examined by Mr. Green Where do you live?—At 4, Abbey Street, Edinburgh.

You are an assistant chemist?—Yes.

In the employment of the Scottish Drug Depôt?—I am book-keeper at present.

You are in Nicolson Street?—Yes.

When a person comes into the shop with a prescription and hands it over to the assistant who is serving, what is the rule in the shop?—The assistant who gets the prescription from the customer takes it to the back, dispenses it, enters it in the book, and then hands it over to the customer again; that is the rule in each shop.

There was a prescription handed in on or about July 19, according to the book which I now show you?—According to this book that is so.

Is that a dispensing book?—Yes, or prescription book.

This prescription is written in by whom?—Mr. Murdoch.

Mr. Morison: Mr. Murdoch is alive?

Witness: Yes, I saw him here to-day.

Examination continued.—Is that Mr. Logan's handwriting (referring to entry)?—I know Mr. Logan's handwriting. As far as I know, that is Mr. Murdoch's handwriting; it is not Mr. Logan's at any rate. In our branches, the party who receives the prescription generally makes it up.

Sheriff Sym: Does the book show that Murdoch made up the prescription?

Witness: Yes, and I expect he received it for that purpose.

Sheriff Sym (to Mr. Green): You have better evidence than this, have you?

Mr. Green: Not on the point as to the prescription.

Sheriff Sym: I cannot accept that evidence; it is incompetent.

Mr. Green: It is the rule, I understand, for chemists to write prescriptions in that way for the purpose of being accurate.

Mr. Morison: It is to comply with the Act of Parliament.

Sheriff Sym: I cannot take this evidence. You can call the witness who can prove it, if you like.

Mr. Green: This is the only evidence we were to lead on that point.

Cross-examined by Mr. Morison.—Is there any part of this book in your handwriting?—This one is not long started.

Is there any part of that book in your handwriting?—Not as far as I see.

You do not keep that book?—No, this is kept in the Leith Walk shop.

Mr. Green: It was brought merely as evidence of the writing.

Sheriff Sym: I cannot in law take such evidence, and I reject it.

The Respondent, sworn and examined by Mr. Green.—When did you go down to the Leith Walk shop?—I cannot give the date from memory, but I can tell from prescription book, part of which I wrote. [Shown book.] I find it was on Monday, June 19.

And you were down until, at any rate, July 19?—Yes.

Do you remember of Allan coming into the shop and presenting a prescription?—I do not.

You do not remember anything of the kind?—No.

I suppose you would not remember much now of what took place down there; you have been away from that shop for some time?—Yes.

You are in the head office?—Yes.

In all the branches are there qualified men?—There are.

And how was it that there was not one on this occasion at Leith Walk?—On that occasion the qualified man was absent at Tollcross shop, so far as I recollect.

I think it was on account of one of the other qualified men leaving unexpectedly?—That is so.

What were your instructions from the head office?—In case of a prescription being brought containing poisons when the qualified assistant was not at hand, I was to request the customer to go to the Ferry Road shop.

As far as you remember you did that?—As far as I remember I did so.

Sheriff Sym: Who was the qualified assistant who was at Leith Walk on July 19?—He was at Tollcross then. Young was his name.

Cross-examined by Mr. Morison: I show you two tickets, Nos. 5 and 6; are these your figures that are on the tickets?—These are my figures.

What do these tickets mean?—That I took over the counter the money for these sales.

Do they mean that you made the sales represented by these tickets?—That is so.

Have you a book with the progressive numbers of those tickets?—Similar numbers appear in all the books.

Are they in the prescription book?—That is not the prescription book.

Are corresponding numbers put into the prescription book?—No. These are duplicates of the numbers on the other page of the cash sales book.

Each salesman has a book in which he enters his sales?—Yes.

Then these are out of your sales book?—Quite so.

I show you No. 4; whose handwriting is that on the bottle?—That is my handwriting.

Is that the only poison you have ever sold?—No.

Have you not sold many poisons?—I have.

Mr. Green said he was entitled to do so, if he did it under a qualified assistant.

Witness: How could an assistant learn his business otherwise?

Sheriff Sym: Your answer is that you have sold poisons under a qualified assistant?

Witness: Yes.

Mr. Green: Is it the case that while one assistant dispenses the prescription another assistant may hand it over to the customer and receive the money for it?—Yes. A prescription may be left to be called for again, and it would not necessarily follow that the party who dispensed it would hand it over the counter.

Is it customary for another party than the one dispensing to write on the label?—It may happen, but it is not customary.

Respondent's evidence closed.

Mr. Green: My defence here is that Logan is a servant. Of course, he says he does not remember selling medicine such as is stated on the date in question. I cannot understand the delay in bringing the matter up against him. Three months have elapsed.

Sheriff Sym: Two months.

Mr. Green: Yes, the date is July 19. There is another matter, and I think it is one that has been confessed by the complainers. I refer to the manner in which they approached the assistant for this medicine. When he was asked for it, in the first place, he objected, and said that he could not do it—that the instructions were that they were to call back when the qualified person would be in. The boy who wished the medicine pressed him, stating that he had often got it before. Now, I do not think the way in which they went about the matter was at all satisfactory. I am not for one moment admitting that Mr. Logan was the party. I am taking up their own proof. I think it is not at all commendable. Mr. Logan has been for a number of years in business, he is not a new hand. With regard to the medicines complained of, take laudanum, for instance. It is certainly scheduled in the Act as a poison that cannot be sold unless it is given over by qualified chemists. But, just to show how paltry this complaint is, there are other medicines more dangerous that are sold every day by unqualified chemists, who sell them over the counter without any restriction, such as carbolic and other things.

Sheriff Sym: Is not that rather a criticism on the schedule of the Act?

Mr. Green: I mention it with a view to show how small the matter is in this case. There is evidence in a way brought forward that Logan seemingly had sold it, but it would appear that at the time there never were two parties present; it is circumstantial evidence. One man came in and gave an order. Then he went out, and another one came in. One of the witnesses, whom I understood to be Tait, says that the witness Allan stood on the other side of the street. Now, I do not think that is at all satisfactory. I do not think there is anything more that I can bring forward in the matter beyond what I have stated.

Mr. Morison: I do not think your lordship wishes me to say anything as to the question of fact.

Sheriff Sym: No. There is no question of law raised here. The facts are perfectly plain. Logan sold these poisons. He does not dispute it himself; he only says he does not recollect it. This was an admittedly scheduled poison. Logan is not a qualified chemist, that is admitted. Therefore the whole points necessary for the prosecution are made out. Logan will be fined £1.

Mr. Morison: And expenses?

Sheriff Sym: Yes.

Mr. Green: Restricted expenses. £1 will only carry so much expenses. There will be no question of imprisonment.

Mr. Morison: It is 10*s.* for each offence. Then there are payments to witnesses over and above, and there is an analysis of the poisons.

Mr. Green: I do not think that was required.

Sheriff Sym: I do not think I can settle what the precise expenses are just now. There is always a statement handed up in a case where there is a statutory prosecution.

Mr. Green: As to the analysis, I do not think it was called for. The article is marked on the outside as laudanum.

Sheriff Sym: I am afraid it was part of the duty of the prosecutor to be ready for that point. The penalty will be 10*s.* for each offence, and £2 for expenses.

### *Complaint against James Johnston.*

The respondent was charged with keeping open shop for the sale of poisons at 88, Grove Street, Edinburgh, on July 14, 1893, and also with keeping open shop for the sale of poisons at 164, Leith Walk, Leith, on July 15, 1893, and with having sold oxalic acid to Thomas Allan, on the aforesaid dates.

The respondent, in pleading guilty, made the following statement: I was in ignorance that I was not allowed to sell oxalic acid. It is a drysalter's business, and we sold the stuff for making washing blue. I was quite ignorant of committing an offence against the Act.

Mr. Morison: I believe what he has stated is quite true. As this gentleman has pleaded guilty, I do not ask the full penalty, but we intend this as a warning to other parties.

Sheriff Sym (to respondent): You will be fined 5*s.* You will also have to pay the expenses of the prosecution, but they are to be modified in your case to £2.

### *Complaint against Alexander Simpson.*

The respondent was charged with keeping open shop for the sale of poisons at 67, Dalry Road, Edinburgh, and with having sold oxalic acid to Thomas Allan, on July 18, 1893.

The respondent pleaded guilty. He said: I only got the business a few weeks before this thing took place, and I had not left my previous situation. The parties who were keeping the shop had been in the habit of selling oxalic acid, and it was continued to be sold. I was quite ignorant that it was an offence at all.

Mr. Morison: I believe the statement he makes is correct.

Sheriff Sym: Simpson will be fined 5*s.* as in the last case, but he will have to pay expenses.

Mr. Morison: Modified to the sum of £2.

### *Case of Robert C. Hunter, trading as R. C. Hunter and Co.*

The respondent pleaded guilty of the same offence, having sold oxalic acid to Thomas Allan in the shop, 28, West Preston Street, Edinburgh, on July 14, 1893.

Mr. Morison: The same circumstances apply.

Sheriff Sym dealt with the respondent in the same way as in the case of the two previous complaints, in respect the respondent was not aware there was any offence. Fine 5*s.* and modified expenses £2.

The complaint against John T. Murdoch being again brought up,

Sheriff Sym, addressing the respondent, said: I heard the evidence in your case first, but, as you were not represented, I wished to see that you had fair play about the legal part of it. You were quite right to take no point in law, for you had none. You sold these articles, but in the peculiar circumstances of your case the penalty will be 10*s.*, but with expenses. The penalty will be 5*s.* for the first offence, 5*s.* for the second, and you are admonished for the third. The expenses will be modified to £2, as in the other cases.

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### SALE OF SOOTHING SYRUP BY A GROCER.

On Monday, the adjourned inquest was held by Mr. S. Smelt, Deputy City Coroner for Manchester, on the body of an infant child, the son of a plumber named Charles Joseph Baines, Garnett Street, Cheetham, who had died from the effects of an overdose of infants' preservative. This had been purchased from a grocer's shop and administered by the mother. The grocer who sold the preservative stated that he did not put a label on the bottle that he sold to Mrs. Baines, but there was a large label on the bottle supplied to him by the wholesale chemist. He had no knowledge of the materials used in making the preservative, and he was not a chemist. The jury returned a verdict of "Accidental death," and censured the mother, also recommending that the attention of the Home Secretary should be drawn to the danger attending the sale of infants' preservative containing narcotics, with the object of preventing such sale in future.

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## Reviews and Notices of Books.

### MANUAL OF BACTERIOLOGY FOR PRACTITIONERS AND STUDENTS, with especial reference to practical methods. By Dr. S. L. SCHENK. Translated from the German by W. R. DAWSON, B.A., M.D.*

Though described as a translation, this book must be regarded as strictly a new edition in English of Professor Schenk's 'Grundriss der Bacteriologie.' Numerous additions have been made, both by the original author and by the translator, and the work is brought thoroughly up to date. The plan, as described in the preface, has been well carried out, methods of investigation having been very carefully dealt with, and special attention paid to elementary technique. The introductory chapter on the general morphology and biology of micro-organisms deals with the subject most systematically and comprehensively, though in a comparatively limited space. The illustrations here, too, as indeed throughout the book, are much clearer than is usual in similar works. Nothing better of the kind could well be done in ordinary letterpress printing. Preliminary processes, apparatus and reagents nutrient materials and methods of cultivation, examination of specimens, etc., are then all considered in order, in a manner that should specially appeal to workers who may have heretofore failed to find an all-round satisfactory guide. The micro-organisms themselves are described according to the localities in which they are met with, with a view to rendering it possible to go thoroughly into the respective methods of research in their proper places. This plan possesses obvious advantages which will be realised to the full by workers who need to perform bacteriological analyses of air, water, earth, articles of diet, pus, or the organs and cavities of the body and their contents. Each of these subjects is considered in a separate chapter, except the last, to which four chapters are devoted, as the extent of the section demands. In each chapter the special apparatus for the branch of work under consideration is described and illustrated, specific methods are then clearly explained, and finally all the micro-organisms known to exist in the particular medium (air, water, earth, etc.), are successively mentioned and described with more or less detail according to their relative importance. Illustrations (about a hundred in all) are given wherever required to elucidate the text, so that the appearances of tube or other cultures can be compared, whilst as much aid as possible is afforded in the identification of specific microbes. Some of the illustrations of pathogenic forms are coloured and, though not printed as separate plates, they are equal to anything of the kind yet produced in a text-book. The representation of the tubercle bacilli in sputum, a double-stained preparation, more faithfully represents what is actually seen through the microscope than many more ambitious productions. An appendix by the translator is devoted to vaccination against cholera, parasitic protozoa, the action of light on micro-organisms, and additional methods and formulæ. It would be difficult to speak too highly of the work, which is certainly one of the most practical yet published in the English language. It is perhaps the best that has yet appeared, as a guide to workers apart from students, and can be recommended with confidence to pharmacists and others who may find it desirable to add bacteriological analysis to their other professional labours.

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* London: Longmans, Green and Co. Pp. i.-xiv., 1 to 310. 10s. net.

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THE CLINICAL USE OF PRISMS; and the decentering of lenses. By ERNEST E. MADDOX, M.D. Second Edition.*

The main object of this book is described as being to communicate a series of aids to precision in the use of prisms in ophthalmic practice. As introductory matter, however, a sketch is given of the simplest properties of prisms, and there is a brief supplementary account of their chief clinical uses. The number of diagrams has been considerably increased in the present edition, and much new material added. Preference has been given to graphic or mechanical demonstrations wherever practicable, so that non-mathematical readers may not experience any difficulty in studying the work.

ST. THOMAS'S HOSPITAL REPORTS, VOL. XXI. Edited by Dr. T. D. ACLAND and BERNARD PITTS.*

The present volume contains, as usual, many communications of value connected with medicine, surgery, and gynæcology. It opens with a biographical sketch of the eminent St. Thomas's Surgeon, F. Le Gros Clark. Dr. Percy Smith's paper on "Sulphonal and Hæmatoporphyrinuria" is of great interest and importance. Mr. Bernard Pitt's article on the "History of Transfusion," with short notes of cases in which the method of infusion of saline fluid into the veins has been adopted, is also full of interest.

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GUY'S HOSPITAL REPORTS, VOL. XLIX. Edited by W. HALE WHITE, M.D., and W. H. A. JACOBSON, M.A., M.Ch.†

This volume contains a long-delayed biography of that celebrated and philosophical surgeon, John Hilton; also a biographical sketch of Edward Cock. The papers in this issue of the reports are mainly of surgical interest. It contains a valuable communication from Dr. Hale White on the "Prognosis of Ascites due to Alcoholic Cirrhosis of the Liver, to Perihepatitis, and to Chronic Peritonitis."

## Obituary.

Notice has been received of the death of the following:—

On the 21st of September, John Howard, Chemist and Druggist, Southampton. (Aged 64 years).

On the 22nd of September, Thomas Good, Chemist and Druggist, Lowestoft. (Aged 80 years).

On the 22nd of September, John V. Bright, Chemist and Druggist, Bath. (Aged 41 years).

## Correspondence.

### DETECTION OF ESERINE.

Sir,—In the Journal for September 2 last, on page 18. a new reaction of eserine, which appears to be extremely sensitive, etc., is mentioned. I beg leave to call attention to alinea *a* and *d*, page 52, article eserine, of the revised American edition of Flückiger's 'Reactions' (Detroit: George S. Davis), where the same green, fluorescent, and more sensitive colour reactions are fully described.

*Detroit.* T. B. NAGELVOORT.

*** It is interesting to find that this reaction has been independently discovered in the United States, but we are unable to confirm the reference, not having yet received the work mentioned by our correspondent.—[ED. PHARM. JOURN.].

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*An Apprentice.*—See book on 'Non-Toxic Remedies,' by Dr. F. von Heyden's successors, printed by Pardon and Sons, Fleet Street, E.C. Also, refer to notes in "The Month" published during the past year, and consult index of last completed volume of Journal.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Fennel, Hill, Newsholme, Reeve, Sutton, Thompson.

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* Bristol: John Wright and Co. Pp. i.-xi., 1 to 170. 4s. 6d.

* London: J. and A. Churchill. Pp. i.-xx., 1 to 531. 8s. 6d.

† London: J. and A. Churchill. Pp. i.-cxxiii., 1 to 565. 10s. 6d.

## STUDY AND PROGRESS IN PHARMACY.*

BY T. LAUDER BRUNTON, M.D., D.SC. EDIN., LL.D. (HON.) ABER., F.R.C.P., F.R.S.,

*Assistant Physician and Lecturer on Materia Medica and Therapeutics at St. Bartholomew's Hospital, Honorary Member of the Pharmaceutical Society.*

Gentlemen,—I have been requested by the President of the Pharmaceutical Society to address a few words to you at the opening of this session, and I do so with all the more pleasure because I reckon myself also a student. We all are, or ought to be, students during the whole of our lives, and the wider a man's knowledge extends the more conscious does he become of his own ignorance. If you look at a map of the metropolitan district, divided into circles, with a centre at Charing Cross, you will readily see that if a man is content to restrict himself to a district within a radius of a quarter of a mile of Charing Cross, he may know pretty thoroughly every street in it. With every extension of the radius, the quantity to be known is greatly increased, and I fancy few men, if any, know thoroughly every street, alley, and court within the four mile radius. The extension of Board Schools has forced almost everybody, whether he will or not, to study at some time of his life, but students vary very much in the subjects of their study, in the objects of their study, and in the manner of their study. Some men study books only, and they may become great scholars, or even write dictionaries, without knowing very much either about their fellow men or about the world in which they live. Others study men, and may become popular preachers or prominent politicians. Yet others study things, and they may become great physicists, chemists, botanists, or zoologists. The objects of study differ. Some study only for the purpose of passing examinations, and the absurdity of such a course is best seen in the Chinese, who goes up year after year until, as a grey-headed old man, he is still trying to pass examinations, his whole life having been spent in a useless endeavour to cram. Others study for their own improvement, trying to acquire such knowledge as already exists, with the object of rendering themselves more useful members of society. There are yet others who are not content with this, but desire to add to the common stock of knowledge, and leave the world wiser as well as better for their presence in it. Of the facilities afforded to such by the Pharmaceutical Society I shall have something to say hereafter, but I would begin by addressing those who may not feel themselves competent to undertake original research, and are desirous of learning simply what is needful to fit them thoroughly for the successful pursuit of their avocation as pharmaceutical chemists. It is quite clear that the Pharmaceutical Society would not be doing its duty if it allowed men to commence practice who were so ignorant that they were likely to make mistakes, dangerous or deadly to the public. It is, therefore, a *sine quâ non* that each student should be able to pass his examinations before entering upon practice. But there are various ways of acquiring the knowledge which will enable a man to pass examinations. In the first year or two of my medical curriculum I used to think that it did not matter where or how the knowledge was acquired, that all that ought to be required was that the knowledge should be forthcoming when the candidate was seated at the examiner's table. I felt inclined to rebel at the medical statutes which prescribed attendance at so many lectures, so much time spent in practical chemistry, practical anatomy, and hospital work. I was much inclined to rail at the framers of those statutes as impeders of progress, as people who did not understand the differences between students, and who were therefore putting a premium upon dulness or laziness by forcibly keeping back those who might have passed the examinations in half the time. But after I had taken my medical degree I got quite a new light upon this subject. I then wished to proceed to take the degree of B.Sc. Some of the subjects requisite for this degree were contained in the medical curriculum, and I had studied them according to medical regulations during a somewhat protracted period. Others were not contained in the medical curriculum, and I set to work to get these up with the utmost speed possible. I believe I passed, if anything, a better examination in the subjects crammed in this way than in those I had studied regularly, but in the course of a few weeks the difference between the modes of study made itself felt. I had been rather astonished at the rapidity with which I was able to get the subjects up. I was still more astonished at the rapidity with which I could forget them. In less than a year I had almost wholly forgotten the subjects I had crammed, while those I had properly studied remained fresh in my memory. I therefore became perfectly convinced that although cramming might do for a Chinese, whose only object was to pass an examination, study prolonged for a length of time was requisite to give the average Briton such a grasp of his studies as would enable him to retain and utilise them. If I thought this experience of mine was at all an exceptional one, I should not have troubled you with it, but I believe it is simply a fair specimen of the experience of the great generality of students. There may be a few who have memories like wax to receive impressions and like steel to retain them, but courses of study and examination ought not to be made for exceptional beings of this class, but for the great average of students. It seems to me that the knowledge displayed by different students at the examination table may be fairly compared to acetic acid. You all know that it is quite possible to get two specimens of acetic acid having exactly the same density but of very different strength, one being pure glacial and the other somewhat dilute. But if water be added to both they behave quite differently. The specific gravity of the dilute acid begins at once to fall, while that of the glacial acetic acid begins to rise, and continues to do so until 10 per cent. of water has been added. After this the addition of more water makes it fall, but it has to undergo considerable dilution before it reaches the specific gravity from which it started. A similar difference can, I think, be observed between knowledge which has been crammed up and knowledge which has been acquired by steady work during a considerable length of time. The crammed knowledge begins to fade away and disappear as soon as the examination is over, while that which has been fairly acquired may appear even greater after some time has elapsed, because the mind has had time unconsciously to assimilate it and has become more apt in its use. The test of mere examination is, I think, as fallacious a method of ascertaining a student's knowledge as the specific gravity alone is of the strength of acetic acid. We have, unfortunately, at present, no test of knowledge corresponding to the dilution of acid. But in pharmacy, when a difficulty exists in distinguishing between a good and a bad chemical product, the difficulty can be got over by prescribing that the substance desired shall be made in a particular way. And thus, as we have no way of distinguishing at present between crammed knowledge and what I may term legitimate knowledge, by examination alone, it seems to me that it would be a good thing to adopt the plan suggested by your own President at the recent International Pharmaceutical Congress, and have a regular curriculum lasting during a certain period for all pharmaceutical students. I have little doubt that many of you, in the great wisdom which pertains to youth, will look upon me as an old fogey and an obstructive, just as I, years ago, looked upon the learned President of the Medical Council and all the members of that body who insisted upon a curriculum of a certain length for medical students. The lapse of years has shown me that they were right and I was wrong, so that I am now grateful to them for an enforced curriculum, and I have little doubt that if a similar rule is passed for pharmaceutical students you will by-and-bye be grateful to those who bring it about, for you will find that it is knowledge steadily acquired and not crammed which will afford a firm basis for further acquirements.

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* Inaugural address delivered at the opening of the fifty-second session of the Pharmaceutical Society's School of Pharmacy, October 2, 1893.

As I have already said, your studies should not cease when you pass your examinations. They ought to continue throughout your whole life. And I think you are particularly fortunate in having such subjects of study as those which you have chosen, for drugs and their actions and uses are alike interesting to the savage who depends upon them for obtaining his food or defending himself from wild beasts, to the romancer of the middle ages, in whose works charms, philtres, and potions played a prominent part, and to the modern novelist, as shown, for example, in 'The Count of Monte Christo.'

The method of preparing drugs for use is always rude at first, and becomes more and more refined as knowledge advances. Primitive man is content to get drunk on simple fermented liquors, but as he becomes civilised he tries to find out the essence or spirit of this liquor, and discovers alcohol. Who first made this grand discovery it is hard to say. According to Christopher North—

> "No wonder that the Irish boys should be so free
> and frisky,
> For St. Patrick was the very man who first invented whiskey."

If St. Patrick really did this, he has the priority in point of time, for he flourished in the 4th century, while Albucasis, who was the first person quoted by Pereira as acquainted with distilling, in Europe at least, only lived in the 12th century.

The crude materials once employed must often have been very disagreeable both to sight and smell. The ingredients of the witches' cauldron mentioned by Shakespeare are not unfair specimens of the kind of drugs formerly used :—

> "Scale of dragon, tooth of wolf,
> Witches' mummy, maw and gulf
> Of the ravin'd salt-sea shark ;
> Root of hemlock, digg'd i' the dark.
> Liver of blaspheming Jew,
> Gall of goat, and slips of yew.
> Sliver'd in the moon's eclipse,
> Nose of Turk, and Tartar's lips ;
> Finger of birth-strangled babe,
> Ditch-delivered by a drab,
> Make the gruel thick and slab.
> Add thereto a tiger's chaudron,
> For the ingredients of our cauldron.
> Double, double toil and trouble,
> Fire, burn, and cauldron bubble."

The plan here described of measuring the time for which the cauldron should boil is a primitive one, and yet I believe it is still used in the present day. Usually when one wants to boil an egg, one puts it in boiling water and allows it to remain three or four minutes by a watch. But when watches were not so plentiful the time used to be measured by an hour glass, in which the sand slowly ran through a narrow aperture. A still simpler way is to sing or chant a few verses of some song, and I believe this is yet sometimes done. If the boiling is to be long continued it will make the measure of time more accurate to dance as well as sing, because the rhythm of the song and dance together will tend to fall into the natural rhythm of respiration, which is about sixteen or eighteen a minute. In this way, both Shakespeare's witches and the primitive pharmacists could regulate the time of boiling their drugs pretty precisely without either an hour glass or a watch. For longer periods of preparation the moon was used, and we still have a remnant of this practice in the word "menstruum," so frequently used in place of "solvent," which obtained its name because many drugs were allowed to soak during a whole month in the liquid which was to dissolve out the active part.

In Shakespeare's lines we also find the idea of the month as the time for preparing active substances, although here the preparation consists in the secretion of poison by a "toad which, under the cold stone, days and nights hath thirty-one, sweated venom." There is an object also in catching it asleep, for it would thus have less opportunity of discharging any of the venom contained in the skin before it was popped into the pot. The history of toads and the ideas which have prevailed about them is very instructive, for it shows how the beliefs of one generation may be scouted by another and again re-established on a firmer footing many years afterwards. I remember reading as a child a story of how King John was poisoned by a friar who dropped a toad into his wine, but sober books of natural history forty or fifty years ago scouted the idea of toads being poisonous at all. A little while ago, however, Dr. Leonard Guthrie sent me an interesting account of a wicked Italian woman whose husband was dying of dropsy. He took so long about it that his wife became tired of the process, and thought that she would help him on. She accordingly caught a toad and put it in his wine, so that he should drink the liquid and die, but instead of doing this, to her astonishment and disgust he completely recovered. Forty years ago this story would have been scouted as equally mythical with that of King John, but now we know that it is precisely what the woman would have expected if she had only been acquainted with the researches of modern pharmacology. For the skin of the toad secretes a poison, the active principle of which—phrynin—has an action very much resembling that of digitalis, which is the remedy, *par excellence*, for dropsy depending on heart disease. It is quite possible that, some of these days, we may get some enterprising firm advertising essence of toad as of superlative virtue for the cure of dropsy. In the same way as one formerly laughed at the idea of toads being poisonous at all, one may sneer at the exactitude with which rules were laid down for the collection of herbs, so that the witches were careful to collect the root of the hemlock at night. But the researches of Sachs, and more recently those of Horace Brown, have shown that starch is formed in the leaves of plants during the day and is consumed during the night. I do not know whether a similar process goes on in the root or not, but, if so, a given weight of a plant collected during the night would be more active than the same weight collected during the day. It is just possible, then, that Shakespeare's witches showed more wisdom in their mode of collecting plants than we moderns do, but even if this be so, we are far ahead of them in knowing the active principles to which the plants owe their physiological and remedial action.

It was just about the beginning of the present century that the first alkaloid, morphine, was discovered. And by whom was this discovery made? Not by a man who had all the appliances of a large institution at his disposal, but by an apothecary in a small German town. It was no doubt isolated previously by a French apothecary, but he did not understand its alkali-like nature, and ascribed its reaction to admixture with alkalies. This apothecary, Sertürner, in the small German town—one might almost say village—not only separated the alkaloid but described its basic properties, recognised its likeness to ammonia, and described the acid—meconic acid—with which it is combined in the poppy. Ever since this discovery the number of alkaloids isolated from plants has been steadily increasing. But of late years chemists have not been content with simply obtaining new alkaloids from plants. They have set to work to make them artificially. Perhaps they have not been quite so successful as had been anticipated, but in the effort to make them numerous bodies have been manufactured, which are becoming of very great use in medicine; so numerous, indeed, are they, and so fast are they increasing, that it is becoming very hard work to keep one's knowledge of them abreast with the times, and a list of new remedies not very many months old is already antiquated.

But great as this department of chemistry is, there is another equally important, which appears to be just coming to the front. I mean the formation of alkaloids in the bodies of animals and of men. We know already that plants frequently contain more than one alkaloid, and that these sometimes have an antagonistic physiological action. Jaborandi, for example, contains two alkaloids, pilocarpine and jaborine, which in their action almost completely antagonise each other, so that one might possibly obtain a specimen of jaborandi having little or no physiological action, and yet containing abundance of alkaloid. Others again, such as nux vomica, contain two alkaloids which, like brucine and strychnine, have a similar action, and will assist each other. Now alkaloids appear to be formed in the animal body, and these have not always the same physiological action. It would appear, for example, that during the day substances having a morphine-like action are formed more quickly than they are excreted, so that towards night the accumulation of these narcotic bodies tends to produce slumber, and so the individual goes to sleep for the night. But during sleep a different set of substances is produced which have a stimulant action, and as these go on accumulating while the narcotic substances are being excreted, the sleep becomes lighter and lighter, until at last the stimulant action gets the upper hand, and the person awakes. Now it is evident that just as the alkaloids derived from plants may antagonise each other, so the alkaloids formed in the body may more or less completely antagonise the action of alkaloids given as medicines, and indeed experience by the bedside has long ago shown that the best time to give a narcotic is in the evening, when sleep would naturally occur of itself. We have been accustomed hitherto to look far too exclusively to the action of a drug, forgetting altogether that the result which it produces in a living body is the reaction between the drug itself and the organism. We have to deal not with one factor but with two, and just as the result may be varied by altering the remedy administered, so it may also be changed by altering the body of the recipient. In cases of uræmia or of approaching diabetic coma one must always be careful how one gives opium or morphine, because a dose which would otherwise be harmless may tend to bring on profound coma. A great deal has been written lately in the medical papers about deaths from anæsthetics, and especially from chloroform, and the utmost care is now used to obtain anæsthetics free from impurity, because impurities have been looked upon, and probably rightly, as being responsible for some deaths. But it is quite possible that the impurity, if we may so term it, is not always to be found in the chloroform administered, but actually exists in the body itself in the form of alkaloidal substances which, in combination with chloroform, tend to produce death. Lately Professor Poehl, of St. Petersburg, was visiting this country, and he informed me that in Russia they are now beginning to pay much attention to this subject, and they are now able, by analysing the urine beforehand, to tell whether the administration of chloroform will be dangerous in any case or not. If the quantity of alkaloidal substances which they can precipitate from it is great, the administration of the anæsthetic will almost certainly be risky, whereas if the alkaloidal substances are scanty, the anæsthetic can be administered with perfect safety. In a tolerably large proportion of the deaths recently recorded, the anæsthetic had previously been taken by the same persons with perfect safety. Why death should occur in such persons after a second or third administration has hitherto been a mystery, but it can now be readily understood on the supposition that from indigestion, imperfect action of the liver, or some other cause, the alkaloids were more abundant at the time of the fatal administration than they were on the previous occasions. The idea which is now being worked out in Russia occurred to me several years ago, and therefore some of the experiments made by the Hyderabad Chloroform Commission, of which I was a member, were made with the object of ascertaining whether disease of the kidneys induced by cantharides, or the alteration in tissue change generally which is induced by phosphorus, would render the administration of chloroform more dangerous. The number of these experiments was too small to lead to any positive result, and at that time there was no good method of quickly determining the amount of alkaloidal substances in the urine, although this can now be done with considerable rapidity and approximate accuracy.

Rich fields of new investigation, rich harvests of practical usefulness in relieving disease and in prolonging life, are rapidly opening out, but how are these to be utilised? In Germany, pharmacological institutes connected with the different universities are fully equipped, and the salaries of the professors and assistants are paid by the State. These institutions contain departments for the chemical investigation of crude substances, of isolated alkaloids, or of manufactured products, and also for the experimental investigation of the physiological action of these substances. It has not unfrequently happened that all the results obtained in an experimental research have been discredited because the drug which the experimenter used was not pure, and a great deal of confusion in regard to the physiological action of the alkaloids of opium has probably been due to various experimenters having worked either with impure alkaloids or with substances which, although bearing the same name, were in reality perfectly different. All this is avoided in Germany by the conjoined action of the chemical and experimental departments in a pharmacological laboratory, but in this country there existed until recently almost no means by which a pharmacological experimenter could be sure that he was really dealing with a pure substance, or even with the substance at all which he supposed himself to be employing. Some years ago, when wishing to demonstrate upon myself the action of nitrite of amyl, I was amazed to find that I inhaled from the bottle which was labelled "Nitrite of Amyl" for several minutes without experiencing the least physiological effect, the reason being that although the drug had been bought as a specimen of nitrite of amyl, it did not contain a single particle of the nitrite. Now, thanks to the liberality of the Pharmaceutical Society, guided by the wisdom of the President and Council, a Research Laboratory has been established which has already done most excellent work, and gives promise of still more in the future. That complicated subject, the alkaloids of aconite, is being unravelled, and Professor Dunstan has prepared pure specimens of the different nitrites which have been tested physiologically by Professor Cash. One great disadvantage under which pharmacological workers in this country previously lay, as compared with those in Germany, is being removed by the formation of a Research Laboratory by the Pharmaceutical Society, and in it men will no doubt be trained who will not only greatly benefit pharmacy, but may supply the want which may ere long be felt of ascertaining the susceptibility of a patient to the action of a drug before its administration. This may no doubt be done, to a considerable extent, by medical men themselves, but medical men are often too busy to give the requisite time. Many of them have not got, and cannot during the intervals of a busy practice acquire, the requisite chemical knowledge, and even when they have the knowledge and the time they may not always have the apparatus or the reagents at their hand, and it will thus, in many instances at least, be easier to request the services of a thoroughly trained pharmaceutical chemist who has all the appliances at hand and is daily engaged in chemical operations.

But all this will increase the necessity for extended knowledge, and while extended knowledge will raise the status of the pharmaceutical chemist it will demand a more prolonged curriculum, as well as a steady study of the subjects long after he has passed all his examinations. Such study will be necessary in order to keep you up to the highest standard of your daily work, but I trust you will not be contented with this. Set before you as an example Sertürner, the apothecary of the little German town of Hameln. Utilise the opportunities of learning methods of work given to you during your curriculum of study, utilise the time for work you may have afterwards, and day by day do your utmost that this world may not only be the better but the wiser for having you in it. "Work while it is day," gentlemen, and constantly remember that "the night cometh when no man can work."

## HOW TO MOUNT BOTANICAL SPECIMENS.

The secret of obtaining fine specimens lies in drying them before decomposition has had time to take place, and applying as much weight as possible without injuring the more delicate portions of the plant. The specimens should remain in the press till all moisture is absorbed, which is, in most instances, about a week. In herbaceous specimens the entire plant is easily preserved. Bulbous roots may be managed with very little trouble by sectioning the root when too bulky. Succulent plants should be immersed in boiling water before being placed in the press. Each sheet should show specimens of both flower and fruit if possible. In the case of herbs this can usually be done with one and the same specimen. When the seasons of flowering and fruiting are separated by some weeks, leaves should be preserved with each specimen, as the foliage often changes materially in appearance during that time. Where it is impossible to show the entire plant on a single sheet, the root and leaves should be shown in connection with the branches. In drying it is well to turn part of the leaves wrong side up, thus showing the appearance of both sides of the leaf; this is especially desirable in the fern family, if only one frond is shown. It is better to mount two or more leaves, and in that way give the different views. Never mount more than one species on a sheet; variations of the same species may be placed together, as the violet self-heal (*Brunella vulgaris*) with its freaks of blush and white. For mounting, Linnæus used sheets of foolscap size, but that is now universally conceded as too small for practical purposes. Most botanists prefer sheets 12 × 17 inches, and some use a double sheet. While this method protects the plant more, it adds to the bulk of the herbarium and to its cost, and on the whole it is questionable whether the advantage gained by the use of the double sheet balances that lost.—From "Hints for Making a Herbarium," in *American Gardening* for June, through *Popular Science News.*

## INSECTS INJURIOUS TO DRUGS.*

BY PROFESSOR L. E. SAYRE.

A knowledge of entomology to the average pharmacist has always been considered of little more value than an ornamental accomplishment, having little more application than the scientific classification and naming of the few drugs derived from the insect world. To give these proper entomological names and understand in some degree their relations to other insects and the relations of the groups to which they belong to other groups has been all that was deemed necessary for the pharmacist to know of this department of scientific study.

It needs little argument to prove that a more intimate study of insects is not only useful, but is almost as essential to those who are supposed to discover the cause of deterioration and to be able to combat the same intelligently. This knowledge should extend to the insect forms which infest and feed upon drugs and their preparations, as the mites and dermestid beetles and forms which prey upon the drug-eating species. This, it may be said, embraces a very limited range in the eyes of the entomologist, but an acquaintanceship with this much of the science should be, for very practical purposes, well understood.

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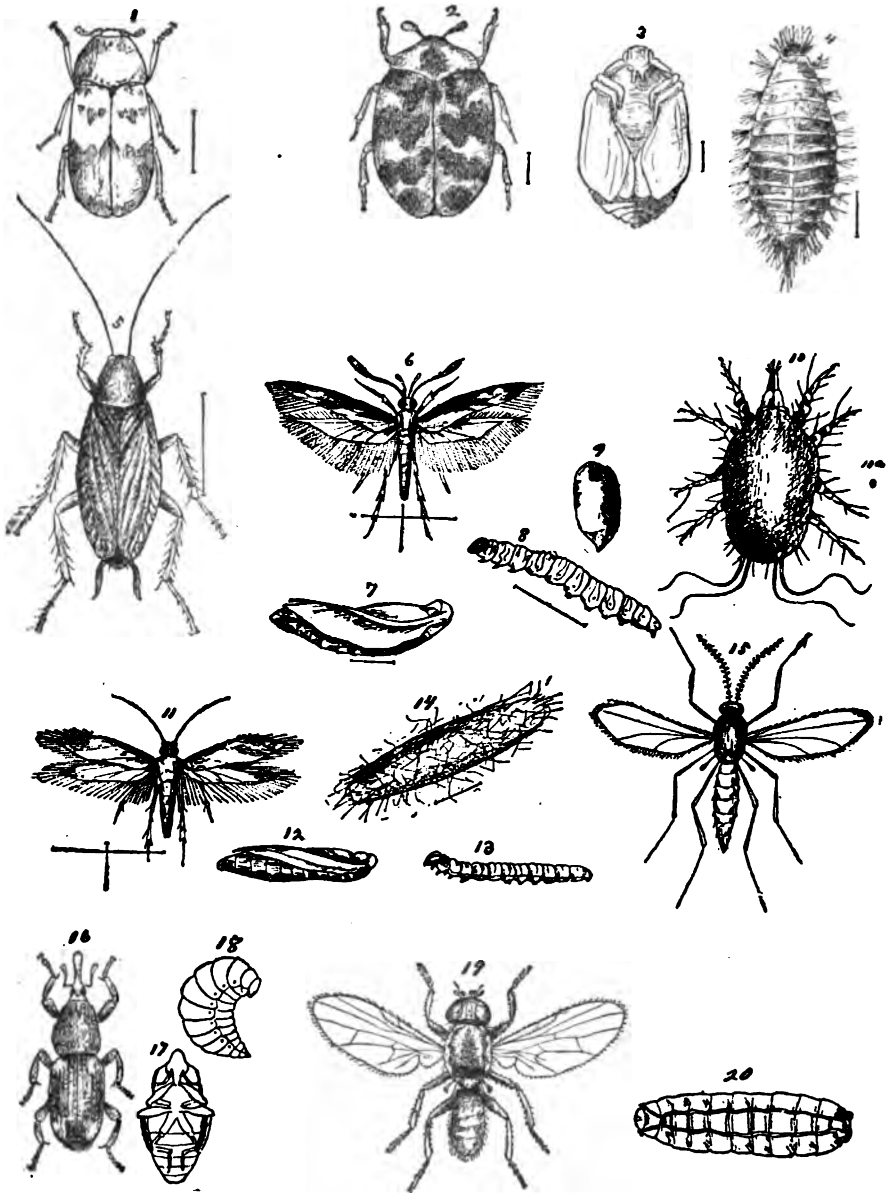
* From the *American Journal of Pharmacy* for July, to the Editor of which we are indebted for the loan of blocks illustrating the paper.

It is not my purpose in the present article to treat of the science, *per se*, or to go into any lengthy detail as to the study of drug-eating insects as has been carried on in the entomological department of the University of Kansas. An article by Professor V. L. Kellogg and myself, describing the work of last year, will be found in the 'Proceedings of the Kansas Pharmaceutical Association' for 1892. Since this time, Professor Kellogg and Mr. S. J. Hunter, to whom I am indebted for the material contributed upon the subject at the last meeting of this Association, have continued this study. I shall in this article briefly glance at the various insects themselves found in various drugs, and make some comments upon them for the better understanding of them.



Referring now to Plate I., I will call attention to Fig. 10. The natural size of this *mite* is found in Fig. 10*a*. This is the common cheese, or flour mite, familiar to most of us, found in farinaceous drugs. The order to which it belongs—the mites—are characterised by having most of the mouth parts united to form a piercing beak. They have two sharp needle-like projections which correspond to the jaws or mandibles of other insects. These stylets or lancets are very useful when the mite needs to pierce some protecting envelope to get at succulent inner matter, or when the mite has to live on "dry food." This mite species lives on raw sugars, in which it appears as small white specks. At least half a dozen species of mites attack cantharides, which, we know, are insects belonging to the great beetle order. Besides the mites, several species of small animal-eating beetles do great havoc in the jars of cantharides. The beetles of the dermestid family, to which belongs the well-known buffalo bug, or moth of the household, feed almost exclusively on the dried remains of animals; at least this is their food when in the young or grub state. Just here it may be well to interpose a few remarks upon certain peculiarities in the life history of insects, the knowledge of which is essential to the intelligent comprehension of the subject in hand.

While in certain groups of insects the young when hatched from the egg (and insects are hatched from eggs almost without exception) resemble the parents, the adults, yet, in other groups or orders—as the beetles; the two-winged flies; the butterflies and moths; and the ants, bees, and wasps—the young appear in wholly different form from that which they will assume when full grown. For example, in the beetles—you remember, we had come to the consideration of certain cantharides eating beetles—the first stage after leaving the egg is that of a grub or worm, so-called. This worm-like stage is called the *larval* stage, and the insect itself a *larva*. In the case of the dermestid beetles, of which several kinds infest the cantharides, the larva is a peculiarly hairy grub, well shown in the accompanying plate. The dermestid beetle here illustrated in its various stages of growth is the buffalo bug, and in Fig. 4 is the "fish"-shaped larva with its hairy body, next the mummy-like pupa (Fig. 3), with its legs and feelers closely folded against its body. This is the second stage in the life of the beetle. After the larva has become full grown, it seeks a sheltered spot, ceases feeding, and becomes transformed into an almost immovable mummy-like object, called the pupa. It remains thus quiet and without eating for a few weeks (in most cases), and then emerges, the perfect beetle (Fig. 2).

There are other species of beetle which attack the pharmacist's stores; for example, *Ptinus brunneus* (I am sorry to be compelled to use these scientific names, but very few insects have common names), a small brown, slender-legged beetle, which feigns death when disturbed, does great havoc in the larval stage, in jars of all-spice, capsicum, and cinnamon. *Anobium paniceum*, one of the so-called "death ticks" and much like the *Ptinus*, attacks agaric and several other drugs. *Lasioderma serricorne*, closely related to the *Anobium* and *Ptinu* (all belonging to the family Ptinidæ), eats, as larva, capsicum and dried tobacco. *Bostrichus dactilliperda*, another member of the same family, attacks sweet almonds. Two species of *Ceutorhynchus*, small, snouted beetles or weevils, infest poppy and other seeds. Another weevil, *Dalandria oryza* (Figs. 16, 17, 18), imported from Europe, infests rice and ground roasted acorns. A near relative is the notorious grain weevil, which does great damage to stored cereals.

Leaving the beetles now, the next group of insects important to the pharmacist is that of the moths and butterflies. While we should hardly expect to find moths and butterflies, with their long nectar-sucking tubes for mouths, injuring our stores, we do find that these same insects in their young or larval stage, when they are familiar to all as "caterpillars," do not a little injury to our drugs.

The moths, like beetles, go through a strange metamorphosis, and while in the caterpillar stage are provided with strong jaws for eating dry food. All know of the clothes-moth, dread foe of the housewife, which, as a small white caterpillar, living in a cylindrical roll or case made from the woollen cloth or fur it is feeding on, does irreparable injury to the choicest fabrics and costliest furs. This moth belongs to the genus *Tinea*, of which one or more species attack drugs. Figs. 11, 12, 13, 14 illustrate the life history of the moth of this genus. Fig. 13 is the larva or caterpillar; Fig. 14 the case or roll in which it lives; Fig. 12 is the pupa or resting stage; and Fig. 11 is the adult moth. The moth is very small, and light brown in colour. Another moth, known as the Angoumois grain moth (it does great havoc to stored grain in the province of Angoumois, France; hence the name), attacks in the caterpillar stage all kinds of stored grain. It bores holes into the grain kernels and eats out the starchy interior, leaving only a delusive hollow shell. The illustrations Figs. 6, 7, 8, 9 show its various stages and the appearance of the infested grain kernels. The larva of *Carpocapsa amplana*, a moth of the same genus as the codlin moth, the greatest insect pest of the apple, infests the seeds of *Corylus avellana*, *Juglans regia*, and *Castanea vesca*. The larva of *Myelois ceratonia* feasts on the fruits of *Ceratonia siliqua* and *Castanea vesca*. The larva of the moth *Œcophaga oliviella* inhabits the kernels of the olive, causing the dropping of the fruit and a smaller yield of oil.

Passing now to another order of insects, the two-winged flies, we find that while the mouth parts of the adult flies are adapted for sucking or lapping, the young flies, which appear as grubs or maggots, are better prepared to partake of solid food. The olive in southern France and Italy is infested by a larva of a fly known as *Dacus oleæ*; in the kernels of fresh hazel nuts are often found the larvæ of a fly which belongs to the same genus as that notorious wheat pest, the Hessian fly (see Fig. 15). The fly *Trypeta arnicivora* (see Figs. 19 and 20, illustrating a nearly allied species, *T. pomonella*) is often gathered in its youthful state with arnica flowers and becomes developed later on, after feeding on the flowers in the pharmacist's canisters.

*(To be continued.)*

## OPIUM TRADE OF CHINA.*

### AMOY.

Opium shows a decrease of 57,395 lbs., or about 8 per cent.; this is due to the rapid advance in price at Hong-Kong during the autumn and the subsequent drop, on account of which speculators invested largely in Persian and Patna; though the Benares drug is still the favourite at Amoy. Foreign houses are not doing much business in opium, and the native drug is making a steady advance in the market. Poppy cultivation is increasing every year, and the quality is not much inferior to the Persian.

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* From Consular Reports for 1892. See also last volume, page 1028, and present one, page 24.

### BANGKOK.

The import of opium during 1892 was 500 chests, valued at £35,406, and in 1891, 1200 chests, valued at £88,000, a decrease which is apparent only. The actual consumption during the two years has been about the same, between 800 and 900 chests, but a larger quantity than was necessary was purchased in 1891, as the price was low. Opium is, of course, chiefly consumed by Chinese in Siam. The Siamese regard the habit as extremely vicious, and it is rare amongst the upper and middle classes. The "roughs," however, who hang about the opium dens of Bangkok become a willing prey to the allurements of this fascinating narcotic.

### CANTON.

The total amount of foreign opium imported from Hong Kong into Canton, Kowloon, and Lappa last year was 1,757,200 lbs. This shows a large and important falling off to the extent of 391,150 lbs. from the importation of 1891. At Canton the decrease was very marked, amounting to 262,403 lbs. As there is no diminution but rather an increase in the use of opium by the people of this district, there must be some reason for the diminished amount passing the Imperial Maritime Customs. Several reasons are given to account for it. One is that large quantities of foreign opium are now smuggled in junks and by passengers in steamers from Singapore. Another reason alleged is the short exportation from Bengal last year and a consequent rise in price in Hong Kong. At this last place there was a decrease of 1555 chests in the importation for 1892, compared with that of 1891, and a decrease of 53,772 chests in the exportation. Another explanation of the diminished return of foreign opium is found in the largely increased use of the native drug. Last year, Szechuan opium was reported for the first time at the Imperial Maritime Customs here. The amount was only 6782 lbs., but it is well known that a large quantity of native opium is carried by land without any payment of tax or duty. It is only when the foreign opium is dear, however, that the native opium is consumed in this district in a large quantity.

### CHEFOO.

Very little opium is imported, as smokers are contented with the native drug, and the consumption does not appear to increase, but if anything rather the reverse.

### HONG-KONG.

The decline in the importation of foreign opium has been heavy and general, owing to three causes, viz.: (1) the increase in the quantity brought by junks from Singapore to Hainan and the adjacent coasts; (2) the advance in price during 1892; and (3) an increase in smuggling into and in the vicinity of the Pearl River. At the three ports of Canton, Lappa, and Kowloon the falling off has been nearly 3000 piculs, and at the six ports in the province—Swatow to Pakhoi—over 4000 piculs. Junks can select their own points of debarkation along the coast, and the sums they have to pay to make good their footing on landing are certainly less than the regular duty and likin. The trade through this channel will increase, to the detriment of the regular revenue, until it has been brought under proper fiscal control. The rise in price of foreign opium has attracted to the province increased quantities of the native drug; and as the latter has now established a foothold it need not cause any surprise if the import of foreign opium in the southern provinces should continue to decline, as it has been doing for some years past in the north of China.

### KIUKIANG.

Importation of opium has decreased, but for no apparent reason, as there is no competition of the native drug, which is almost unknown, and finds no market in this district.

### LAPPA.

The annually increasing importation of opium from Singapore direct into the south-western districts, where it evades duty, is rapidly supplanting that which has to bear the customs and likin taxation. There is no decline in the amount of opium consumed, but only in the quantity which pays duty. Extensive smuggling of prepared opium is carried on by organised bands, numbering from thirty to forty men, fully armed with repeating rifles. This opium is prepared in Macao, conveyed across to Lappa, and carried overland to Shikki, whence it goes by boat to Canton. It is computed by competent authorities to aggregate fully 300 chests a year, irrespective of what is smuggled by junks, concealed in crates of fish or in jars of soy; and though it has not seriously affected Lappa trade, it can scarcely have failed to have materially affected the amount of import-paying duty at Canton. The territorial officials are concerting measures to repress these armed bands, and if energetic action be taken, a considerable diminution in this illicit traffic should undoubtedly result, and a source of danger to the peace of the district be removed.

### PAKHOI.

There is a progressive decrease in the import of Indian opium. Great quantities of Indian and Yünnan opium are smuggled, and enter without paying custom dues.

### SWATOW.

The smuggling of opium overland is very extensive, and the profits are large: but the journey from Szechuan to Swatow takes about three months, and the danger to the porters of robbery on the road is not small.

### TAINAN.

Opium is the principal article of import, and the consumption is increasing, owing to the greater prevalence of smoking amongst the urban populations and the comparative cheapness of the Persian drug, which has nearly excluded the Indian altogether. Differential duties have caused foreign importation to suffer severely, to the benefit of the junks.

*(To be continued.)*

The Pharmaceutical Journal.
FIFTY-THIRD YEAR OF PUBLICATION.
SATURDAY, OCTOBER 7, 1893.

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the Council meeting last Wednesday, the chair was taken by Mr. Cross, in the absence of Mr. Carteighe, who is still engaged with the business of the British Commission at Chicago. After the minutes of the August meeting had been read, the Vice-President referred to the death of Professor Maisch, and moved that a formal expression of regret should be entered upon the minutes, to be communicated to his widow and family, with an expression of the warmest sympathy with them in their bereavement. The motion was seconded by Mr. Hampson, and supported by Messrs. Martindale and Martin, who testified to the valuable services rendered to pharmacy by Professor Maisch, and to the high esteem in which he was held by his American colleagues.

The additions to the roll of the Pharmaceutical Society comprised four pharmaceutical chemist members, one chemist and druggist member, nine associates, and twenty students.

The report of the Finance Committee, which presented no exceptional features, was adopted.

On the recommendation of the Benevolent Fund Committee, one grant of fifteen pounds, one of thirteen pounds, and two of ten pounds each were ordered to be paid. The Secretary submitted a statement relating to the annuitants, showing that there are now forty-four, and, on the recommendation of the Committee, it was decided to add four additional annuitants, to be elected in December next from among ten candidates who had been approved by the Committee.

In the discussion of this subject, the Vice-President, as Chairman of the Committee, expressed regret that the subscriptions to the Benevolent Fund had not increased to the extent which had been hoped for, and that, though no opportunities have been missed for urging upon members of the trade the claims of the Fund, the Committee was only in a position to recommend the election of four additional annuitants, while there were no less than ten candidates whose cases had been approved of as requiring relief, and in regard to which it was impossible, as Mr. Atkins said, to make much distinction. This feeling of regret was shared by Mr. Hills, Mr. Bottle, and other members of the Council, who pointed out that a further amount of about five hundred pounds is required for meeting the demands made upon the Fund. This experience is naturally a source of considerable disappointment to those who last year advocated an increase in the amount of the annuities, in the hope that the extra expenditure would be made up by additional subscriptions. In view of this state of matters some objection was raised by Mr. Rymer Young to the recommendation of ten candidates while only four of them could be elected, chiefly on the ground of the expense and trouble to which the six unsuccessful candidates would probably be put. On the other hand, Mr. Harrison thought that such a demonstration of the disparity between the capability of the Fund and the approved claims made upon it would have the effect of an object lesson in convincing members of the trade that larger support is required from them. The disadvantage under which some candidates were placed by the present system of election was also referred to by Mr. Hampson, and he announced his intention of bringing that subject under the consideration of the Council at the first opportunity. The mode of election which he considers desirable would do away with much of the inconvenience which candidates for election now have to bear, but unless its adoption were accompanied by an increased capacity to afford relief to deserving cases it would have the effect of depriving some of them of the chance of being elected, and they would probably be unwilling to lose that chance. The more serious deficiency appears to be the want of means to relieve all the cases of distress in which an appeal is made to the administrators of the Fund. It was, no doubt, that fact which was present in the mind of Mr. Bottle when he remarked that the Fund is being overtaxed, or to put the statement in a conversive form it is not equal to the claims made upon it. The only remedy for that defect is larger support from the trade generally, and, as Mr. Johnston pointed out, it is only by the exercise of local influence by the Society's provincial secretaries and others that there is any prospect of obtaining additional subscribers, so as to render the Benevolent Fund capable of adequately relieving the misfortunes under which it is the fate of some members of the trade to suffer. If such a result as that achieved in Mr. Johnston's district were extended to other localities, a very material addition would be made to the resources of the Fund, and there would be a possibility of its benefits being more widely distributed.

Mr. T. R. Kent was appointed Divisional Secretary for North Lambeth, in the place of Mr. **Storey**, who has removed from that neighbourhood.

The report of the General Purposes Committee gave the Solicitor's statement of the progress made with cases in his hands. Many persons who have infringed the Pharmacy Acts have paid the penalties thus incurred, and a number of cases are still awaiting trial. Proceedings were ordered to be taken in a number of cases which have been reported to the Committee.

### THOROUGHNESS IN STUDY.

In his inaugural address, delivered at the opening of the School of Pharmacy on Monday last, Dr. **Lauder Brunton** was careful, and we think wisely so, to distinguish between knowledge acquired gradually, during a somewhat protracted period, and information "got up," in a comparatively brief time, specially for examination purposes. Whilst the latter is usually forgotten very shortly after the test is applied, the thorough grasp acquired of the subjects deliberately studied, in the course of an extended curriculum, suffices to keep them fresh in the memory, upon which an impression is made that is ineffaceable, even in the course of years.

It was but natural then that Dr. **Brunton** should approve of the suggestion, recently brought once more to the front at the Chicago meeting of the International Pharmaceutical Congress (*ante*, p. 230), that there should be a regular curriculum of study enforced for all pharmaceutical students. After expressing his sense of personal gratitude to the medical authorities for insisting upon such a curriculum in the case of medical students, he said that there was little doubt that a similar regulation in pharmacy would eventually be regarded favourably by those whom it would chiefly concern, since they would find that it was "knowledge steadily acquired and not crammed" that would afford a firm basis for further acquirements.

To apply the remarks of Dr. **Pollard** at the opening of the medical session at University College to the case of pharmaceutical students, in pursuing their special work they cannot do better than adhere strictly to the order of study prescribed by a curriculum, for that would be arranged with definite educational objects—to lead them on from the more exact and fundamental studies of chemistry, botany, etc., through the less exact but equally fundamental studies of materia medica and dispensing to the final study and practice of pharmacy. It was also properly pointed out that in all studies there must be a clear discrimination between facts as observed, and inferences from facts and mere theories, for the latter are liable to vary with additions to knowledge, but facts are good for all time. Intelligence must be brought to bear on debatable questions, and reverence for authority not allowed to warp individual judgment. Then if, as Dr. **Brunton** recommends, opportunities of learning methods of work be properly utilised and day by day students do their utmost, the world may not only be the better but the wiser for having them in it.

### NEW BOOKS.

The first part of a 'Handbook to the Flora of Ceylon,' by Dr. **Henry Trimen**, F.R.S., Director of the Royal Botanic Gardens, Ceylon, and a corresponding member of the Pharmaceutical Society, has been published under the authority of the Government of Ceylon. The work is to contain descriptions of all the species of flowering plants indigenous to the island, and notes on their history, distribution, and uses. There will also be an atlas of plates illustrating some of the more interesting species. Part 1 deals with the natural orders Ranunculaceæ to Anacardiaceæ, accompanied by twenty-five plates.

Two new editions of his well-known manual of chemistry have just been produced concurrently by Professor **Attfield**, the fourteenth adapted to the Pharmacopoeia of the United States and the fifteenth to the British Pharmacopœia. The latter is of the same size that custom has rendered familiar, and in general appearance resembles its predecessors. By the abbreviation or suppression of descriptions of processes now more or less superseded, however, room has been found for extensive alterations and additions necessary for the demonstration of the latest developments of chemical principles and the latest applications of chemistry to pharmacy. Quite recently (*ante*, p. 231) we noted that Professor **Attfield** had been elected to the honorary membership of the Schweizerische Apotheker-Verein, and a further compliment, we understand, has now been paid him by the Council of the Pharmaceutical Society of Queensland, which has placed his name upon the list of "Honorary and Corresponding Members" of that Society.

### SCIENCE SCHOLARSHIPS.

Having completed his University training, Mr. **Richard Harding Bremridge**, B.A. Oxon., B.Sc. Lond.—son of Mr. **Richard Bremridge**, Registrar of the Pharmaceutical Society—has, at the outset of his purely medical career, been elected to an entrance scholarship in natural science at St. Bartholomew's Hospital, London. We note also that the chief entrance science scholarship at the St. Thomas's Hospital Medical School, of the value of one hundred and fifty pounds, has been awarded to Mr. **Robert Wynn Charles Pierce**, who was a **Bell** Scholar in the Society's School in 1883.

### PHARMACEUTICAL EDUCATION.

We are asked to announce that the Council of the Glasgow and West of Scotland Pharmaceutical Association has arranged with the Glasgow School Board that a preparatory class for the Preliminary examination of the Pharmaceutical Society be opened in the City School, 74, John Street. Particulars may be obtained of the Secretary, Mr. **Alex. Laing**, 211, Great Western Road.

### COMMISSION OF THE PEACE.

We are informed that Mr. **George Ernest Clarke**, pharmaceutical chemist and local secretary for Lowestoft, has been appointed a magistrate for that borough.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, October* 4, 1893.

Present—

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Abraham, Allen, Atkins, Bottle, Greenish, Grose, Hampson, Harrison, Hills, Johnston, Leigh, Martin, Martindale, Richardson, Southall, Storrar, and Rymer Young.

The VICE-PRESIDENT, in taking the chair, said they would all regret the absence of the President, as they had hoped to hear from him an account of his delegation to the American Conference, but a telegram had been received stating that he would not be able to leave Chicago until that day (Oct. 4th). Probably his duties as one of the Royal Commissioners to the Exposition had detained him, no doubt to his regret. He was sure they would all wish him a pleasant and prosperous voyage, and would all join in giving him a hearty welcome on his return.

The minutes of the August meeting were then read and confirmed.

### THE LATE PROFESSOR MAISCH.

The VICE-PRESIDENT said his first duty was to propose a resolution with reference to the closing of the career of Professor Maisch, on whom the highest pharmaceutical honour, the Hanbury Medal, had so recently been conferred. Like many in the craft, he was the son of a shopkeeper, in Germany, but he received a liberal education and made the most of it. He had some difficulty in choosing a profession, and even when he had settled upon one, he got mixed up in another movement, which, though it might have been a step in the unification of Germany, certainly was the means of New York gaining a citizen of whom she might be justly proud. Some of their young friends who thought it was no use studying things which appeared to have no direct bearing on their calling might be reminded that, owing to Professor Maisch's early love of study, he was able to start upon a new career in New York, and so successfully, that he shortly became a teacher in Professor Parrish's school, and he soon attained and held to the end of his life a foremost place in American pharmacy. He was made an hon. member of the Society in 1887, when his name was added to an already illustrious list, and happily before his death, the blue ribbon of pharmacy, the Hanbury Medal, was handed to him. He was too ill to attend the Conference at Chicago to receive the medal, but it was conveyed to him on his death-bed, and he evidently appreciated the honour paid him. He would move—

> "That this Council learns with deep regret of the death of Prof. J. L. Maisch, who has been associated with the Pharmaceutical Society as an hon. member since 1887, and whose work in extending the province of pharmaceutical knowledge was so lately acknowledged by the award to him of the 7th Hanbury Gold Medal. The Council, on behalf of British pharmacists, desires to express the warmest sympathy with Mrs. Maisch and family in their heavy bereavement."

Mr. HAMPSON, in seconding the motion, said he was glad to think that the departed Professor was able to recognise the distinction which had been conferred upon him. A life well spent always left behind it a force which lasted much longer, and much of the work which Professor Maisch had accomplished in pharmaceutical matters might be regarded as a legacy to the whole world.

Mr. MARTINDALE said he attended the meeting of the American Pharmaceutical Association in Chicago in company with Mr. Martin, a couple of months ago, and then learned for the first time that Professor Maisch was very seriously ill, and that it would be impossible for him to attend the meeting. They were very glad to hear that, although a German by birth, he had made himself heart and soul an American, and was held in universal esteem by American pharmacists.

Mr. MARTIN said he should like to add a word or two on this motion, which he had scarcely anticipated would come on to-day, or he would have prepared himself better. It was the great regret of his visit to America that Professor Maisch was so ill that it was impossible for him to make his acquaintance. He, however, had the pleasure of spending a day with Professor Remington, who told him that although Professor Maisch was so feeble when he handed him the medal that he could only express his thanks by a look, yet that look was so eloquent of his appreciation of the honour done him that it would be one of the most pleasant reminiscences of his life that he had been able to place the medal in his hands.

The motion was carried unanimously.

### ELECTIONS.

#### MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Barley, Alfred Henry | Ilkley. |
| Booth, Samuel Verdon | Whitby. |
| Cleave, Reverdy | Pontefract. |
| Corfe, Alfred Frederick | Maidstone. |

*Chemist and Druggist.*

The following, who was in business on his own account before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society:—

| | |
|---|---|
| Bane, Thomas Perry | Marlborough. |

#### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Davies, Thomas | Llanybyther. |
| Strawson, Vincent V. L. | Liverpool. |

#### ASSOCIATES.

The following, having passed their respective examinations, and tendered (or paid as students) their subscriptions for the current year, were elected "Associates" of the Society:—

*Minor.*

| | |
|---|---|
| Goodall, Horatio Charles | Lincoln. |
| James, George Christopher | Yardley. |
| Mitchell, William | Glasgow. |
| Saunders, Frederick George | London. |
| Sewell, Edward Augustus | Bradford. |
| Woodward, John Thompson | Hull. |

*Modified.*

| | |
|---|---|
| Bass, Charles Murfleet | Rugeley. |

#### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year were elected "Students" of the Society:—

| | |
|---|---|
| Avery, Cuthbert Johnson | Birmingham. |
| Binks, Thomas Coates | Castleford. |

| | |
|---|---|
| Blackwell, Henry | Great Bridge. |
| Duncan, William Balderston | Portobello. |
| Dunstan, Sydney | London. |
| Evans, Evan Castell | Llanarth. |
| Gordon, David | Liverpool. |
| Grosskopf, Gustavus Adolphus | Manchester. |
| Hodgson, Walter I. | West Hartlepool. |
| Kendall, Ernest Henry | Oundle. |
| Masters, Herbert Bazeley | Bristol. |
| Moore, Francis Henry | London. |
| Orchard, Fred. | Highbridge. |
| Paterson, George Derwent | Workington. |
| Potts, William | Sunderland. |
| Shaw, Frederick Bertram | Holmfirth. |
| Strother, Alfred Emmerson | Newcastle-on-Tyne. |
| Suddaby, J. Edwd. Stephenson | Hull. |
| Watson, David | Glasgow. |
| Williams, John Matthew | Bangor. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and the restoration fee of one shilling.

### Report of the Finance Committee.

This report was of the usual character, and recommended various accounts for payment.

Mr. **Martindale** (as Chairman of the Committee) moved the adoption of the report and recommendations. There was nothing calling for any special reference, either with regard to the receipts or expenditure.

The motion was carried unanimously.

### Report of the Benevolent Fund Committee.

The report of this Committee included a recommendation of the following grants:—

£13 to a registered chemist and druggist (aged 64), who had a similar grant in October, 1892. (Landport.)

£10 to the widow (aged 46) of an associate and subscriber, who has had two previous grants of £5 each. (Birmingham.)

£15 to the widow (aged 63) of a member. She has had two previous grants of £10 each. (Wheathampstead.)

£10 to a registered chemist and druggist (aged 60) who is crippled and has an invalid wife and daughter. (Goole.)

Two cases had been deferred, and three others the Committee had declined to entertain.

The Secretary submitted a statement with regard to the annuitants, showing that in October last there were forty-two on the list, and four were added last December; two had died during the year, leaving forty-four. The Committee had recommended that four more annuitants be elected on Tuesday, December 12.

The Committee having considered the cases of the applicants who had applied during the past year, recommended that the following, who were deemed to be the most deserving and necessitous, be placed on the list of approved candidates for an annuity, for election in December next:—

Baker, William S. (80), Clacton.
Bromfield, Charles (71), Exeter.
Ellis, Elizabeth (60), Burnham (Essex).
Haworth, James King (77), London.
Kershaw, Ellen (63), Wheathampstead.
Watson, James B. (85), Phipping (Lancs.).

The following were the unsuccessful candidates at the last election:—

Kent, Alfred (76), Ramsgate.
Peatson, Ann (69), Manchester.
Wavell, Mary A. (67), Brighton.
Willison, Alfred A. (71), London.

The Council went into committee whilst the details of some cases were discussed.

On resuming, the Vice-President (as Chairman of the Committee) moved the adoption of the report and recommendations. He said there had been a good many cases before the Committee, and a considerable sum had been voted, and he was sorry to say that the subscriptions, though about up to the level of last year, had not increased to the extent hoped for. No opportunity was missed for urging the claims of the Fund, and he hoped that in due time this appeal would bear fruit. It would be noticed that there were ten approved candidates for annuities, though it was only proposed to elect four.

Mr. **Atkins** seconded the motion. He said the Committee weighed very carefully each application, and there was a great deal of correspondence to go through and analyse. He hoped the Committee would not be compelled, owing to the increased liberality to annuitants, to in any way curtail the amount granted from month to month, for he had had occasion in his own neighbourhood to recognise how valuable this kind of assistance often proved. With regard to the annuitants, he confessed to having had some misgivings at the time the amount was increased, whether the generosity of the Council was not in advance of its means, and there was now the unpleasant fact to face, that while there were ten names on the list, all of whom were well deserving of assistance, the Committee could only see its way to recommend the election of four, so that six must of necessity be unsuccessful; some were very advanced in years, and all were very necessitous cases. He should like to add that the Committee thoroughly appreciated the assistance of their friends in the country in sending up information. Mr. Reynolds, of Leeds, had taken a great deal of trouble with regard to one case, and the Committee were very grateful to him for it.

Mr. **Rymer Young** suggested that as only four annuities could be granted this year, it was rather unwise to recommend ten as suitable candidates. He knew Mr. Hampson desired that some day the Council should take the election entirely into its own hands, and while he was not prepared to go so far as that, he thought the number of candidates should be reduced. The objection to the present system was that six persons would inevitably be disappointed, though they would be put to considerable expense, and there was no security whatever that the four most deserving cases would be selected. In fact, judging from past experience, he had reason to think that some of the weaker cases had succeeded. It was a question of influence, and pushing, and successful canvassing, which did not always bear any definite relation to the merits of the candidates. He thought it would be easy for the Council to recommend say six candidates, and there would thus be a certainty that at least three or four of the most deserving would be elected. Or course he admitted fully that every one of the ten was a deserving case, but there were degrees in all things, and probably the Committee could pick out six whom there could be no hesitation in saying were the most deserving cases. It was a pity to put six people to the expense and trouble of a canvass for nothing.

Mr. **Hills** regretted very much that during the last twelve months the subscriptions had not increased, as some of the more sanguine members of the Council expected. They really required about another £500 a year in order to keep up the old number of annuitants at the enhanced rate; and up to the present the subscribers had not sufficiently answered to the appeal made to them. He hoped for a better result before next year, especially in the number of subscribers, for if every one on the register would only give 2s. 6d. a year, it would about do what was wanted.

Mr. **Hampson** agreed with Mr. Hills that at least £500 more was required if the present grants were to be continued and the same number of annuitants elected. It appeared to him that if they were not careful the Fund was likely to get into the same position as many of the hospitals of London, who were practically dependent on the amount left them by legacies. If they could get sufficient legacies, well and good, and he should like to suggest to the rich to bear this matter in mind. He believed there were a good many who only required prompting, and he hoped they would take the hint now offered; the appeal was especially made to those of large means, but even small legacies would be very acceptable.

Mr. Harrison said he assumed the list of names to be placed before the voters had been carefully analysed, and that in reality the Committee would have had a great difficulty in striking out even one name. He quite understood Mr. Young's sympathy with the six who, after the election, would be grievously disappointed, but there was another view of the case to be remembered. When the members saw the demands made on the Fund, and that the Council itself had a difficulty in reducing below ten the number of applicants, though there were only four vacancies to fill, they would feel that it was a distinct call upon them to support the Fund more generously. For some time past they had got on fairly well, and he feared the impression had got abroad that the funds were ample for all purposes. There was nothing like an object lesson to teach some people their duty, and he hoped this would supply it. It could not be too clearly understood that every case was most carefully inquired into; they were supported by the authority and influence of local men acquainted with the circumstances, and no effort was spared to make sure that everyone placed on the list was a fitting recipient of charity. He hoped the result of the discussion would be that greater interest would be taken in the Benevolent Fund.

Mr. Richardson said this sort of discussion took place every year, so far as he remembered. It was a very painful fact that the Fund was not better supported by those not connected with the Society. On carefully reading the list of candidates it would be seen that the majority had never been connected with the Society or contributed one penny towards it, and though the chemists and druggists had been repeatedly appealed to they did not seem to take the slightest notice. Even 2*s.* 6*d.* a year from every one not connected with the Society would give the Council ample means to deal with the cases which came before it.

The Vice-President, in putting the motion, pointed out to Mr. Young that all the particulars of the various cases would be printed and circulated with the voting papers, and on reading them through he thought he would find a difficulty in selecting four or six out of the number. He would also point out that the unsuccessful candidates did not spend their labour altogether in vain, as the votes they received were carried forward to the next occasion.

The motion was then put and carried unanimously.

Mr. Hampson then moved—

> "That four additional annuitants be elected on the Benevolent Fund, and that the election take place on Tuesday, December 12 next."

He felt that he occupied a somewhat dubious position in moving this, holding the views he did as to the mode of election, and could not help saying a word on that method. Mr. Young had already referred to the subject, and he thought his position was to a certain extent sound, notwithstanding what had been said by the Vice-President. If the Council could guarantee that the candidates would receive anything like a fair and intelligent estimate of their special claims, the matter would be beyond suspicion, and the most suitable cases would be elected, but unfortunately such conditions did not prevail. They knew very well that if wholesale houses and others exercised special influence in favour of any pet case, they could carry the election of anyone they chose, and that was an abuse which ought not to be tolerated. They also knew that men of eminence and public position could, whenever they liked, secure the election of a favoured candidate. That might be right, but he very much questioned it. The Fund ought to be administered on the best and least objectionable principles, and he should take the opportunity shortly of bringing forward a resolution, and taking the opinion of the Council upon it. In the list about to be issued there was one candidate of eighty-five, and he considered it monstrous that a man of that age should run any possible chance of failure, yet probably he would be unable to use any personal influence such as younger candidates could employ.

Mr. Bottle seconded the resolution with some amount of disappointment. He was disappointed to find that in entering on the generous course so strongly recommended by the President they seemed to be landing the Benevolent Fund in a difficulty, and had there not been four unsuccessful candidates at the last election he would not have supported the motion to elect four in December. He felt that the Fund was being overtaxed, and that in some way, sooner or later, they must bring about a balance of receipts and expenditure. He was not disappointed that gentlemen of good position who had taken an interest in the Society did not more liberally subscribe, because he was bound to say that from time to time very liberal donations had been received from men of that stamp, but he was disappointed that the rank and file of the trade, who received so much benefit from the Fund, were so blind to their own interests that the majority of them could not see their way to give even 2*s.* 6*d.* a year to it. When Mr. Hampson brought forward the motion to which he had referred he should give it his very careful attention, for he could not but feel that the Fund was not in the position in which he should like to see it.

Mr. Atkins said he was much struck by the remarks of Mr. Bottle, whose long experience on the Council lent great weight to everything he said. He would not say anything further on the question of whether there had been any excess of generosity in the amount of the annuities, but Mr. Bottle's observations were certainly of a serious character. He did not at all agree with the views expressed by Mr. Young, and was distinctly in favour of placing ten names before the country, though only four could be elected. This would have the effect, if anything would, which Mr. Harrison had suggested, of an object lesson, and he must say he should not have liked to undertake the selection of four names out of the ten. All the cases had been carefully weighed, some of them several times, and he could not be a party to the selection of a limited number out of the ten. He would not say anything on the point which Mr. Hampson had so much at heart, except to promise the most careful consideration of the matter when he brought it forward.

Mr. Southall said the great difficulty at present was the want of funds, and Mr. Harrison told them that the coming election would be a good object lesson; but unfortunately only the present subscribers would profit by it. Those who had no votes would know nothing about it. Would it not be well to send out a statement to the whole trade, and endeavour to obtain subscriptions from those who might in future years look to have some benefit from the Benevolent Fund.

Mr. Allen reminded Mr. Southall that this was done regularly once a year in February.

Mr. Johnston said when it was decided last year to raise the amount of the annuities, a special appeal was made to members of the Council to devise some means of appealing to the trade for subscriptions. That was done in the district he came from, with the result that the number of subscribers was raised from six or eight to thirty. If the same thing were done by all local secretaries, a very much larger sum might be got, quite sufficient to keep up the list of annuitants even at the enhanced rate. He was satisfied that if local secretaries were asked to do so, by getting the assistance of some other members they would be well received by the trade, and would collect a great deal more money.

The VICE-PRESIDENT, in putting the motion, said the local secretaries had a reminder of this sort sent them every year, to which some responded and some did not. He hoped the time would never come when they would have to reduce the amount of the annuities. He supported the advance most heartily at the time, and should continue to do so, because an annuity given to a distressed chemist ought not to be comparable to parish relief, but to be something adequate to the position he formerly occupied, and anything less than £50 a year to a man over sixty years of age seemed inadequate. When the Treasurer brought forward his motion he should give it his most careful attention, knowing the deep and intelligent interest he had taken for so many years in the working of the Fund.

The motion was carried unanimously.

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Mr. HILLS said he had just received a letter from Mrs. Rayner, the widow of a pharmaceutical chemist and life member, who had unfortunately lost her husband during the year, and was left with eleven children, ten of whom were dependent upon her. She was anxious to get one of them—William, aged nine and a half years—into the Royal Asylum of St. Anne's at Redhill, and he was sure that on this being made known any of the craft who had votes for that admirable institution, if not already promised, would support so deserving a case.

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### REPORT OF THE GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the Solicitor, stating the progress made with cases placed in his hands. A large number of defendants had paid penalties and costs, and several cases are standing for trial.

A large number of additional cases of infringement of the Pharmacy Act was reported to the Committee, and proceedings were recommended.

Complaints having been received from several members with regard to further libellous letters being written by Mr. George W. Sargent, the Committee recommended that the President be authorised to take such steps as he may think desirable to secure a discontinuance of the annoyance.

Communications had been received from Nottingham and Edinburgh respecting the medicine stamp duty, and it was recommended that they should be referred to the Law and Parliamentary Committee for consideration and report.

The Council went into committee to consider the above report.

On resuming the report and recommendations were unanimously adopted, and formal resolutions were passed authorising the prosecution of the individuals named.

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The VICE-PRESIDENT said a letter had been received from Mr. Jowett, thanking the Council and the founder of the Manchester Pharmaceutical Association Scholarship for the generous grant made to him at the August Council meeting, and stating that it would be his earnest endeavour to show by his work that he had made the best use of the advantages accorded him.

### THE SHEFFIELD SCHOOL OF PHARMACY.

The VICE-PRESIDENT said a letter had been received from the Secretary of the Sheffield School of Pharmacy asking the assistance of the Council to make the Museum more complete and satisfactory for educational purposes, and enclosing a list of requirements. He knew something of this school, which might be considered one of the foremost in the country, and suggested that the letter be referred to the Library, Museum, and School Committee.

This was agreed to.

### UNITED STATES PHARMACOPŒIA.

A letter had been received from the Chairman of the Revising Committee, stating that a copy of the revised edition of the United States Pharmacopœia had been sent for the Library of the Society. A vote of thanks was passed to the Publication Committee for the gift.

### DIVISIONAL SECRETARY.

Mr. T. R. Kent, 103, Westminster Bridge Road, was appointed Divisional Secretary for North Lambeth in the place of Mr. Storey, who has removed from the neighbourhood.

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After the conclusion of the Council meeting,

The VICE PRESIDENT announced to the members present the death of Mr. Lansdown, who had been for many years consulting architect and surveyor to the Society, and he was requested to write a letter of condolence to Mrs. Lansdown and her family.

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## OPENING OF THE SOCIETY'S SCHOOL OF PHARMACY.

The fifty-second session of the School of Pharmacy was inaugurated on Monday, October 2, the chair being taken, at three o'clock, by Mr. W. GOWEN CROSS, Vice-President of the Pharmaceutical Society, in the absence of the President at Chicago.

The Dean of the School, Professor DUNSTAN, was first called upon to read his report on the work of the past session, as follows :—

*Report on the School of the Pharmaceutical Society for the Fifty-first Session,* 1892–93, *by the Dean of the School, Professor Dunstan.*

Eighty-seven students attended the Society's School during the past Session, a number slightly above the average of the last ten years, though smaller by seven than the record of the previous Session.

In the Department of Chemistry there were forty-eight students, of whom thirty-two attended during the whole Session. In addition to the courses of lectures given by the Professor, a course of supplementary lectures has been given by the Assistant Lecturer, Mr. Harrison. The work and general conduct of the students has again been excellent. As is so often the case, the two medals have been secured by the two Bell Scholars, the Bronze Medal being taken by Mr. Ernest Goulding, and the Sessional Silver Medal by Mr. Thomas Tickle. Certificates of Honour were gained at the conclusion of the first course of lectures by Mr. Francis Rose and Mr. Thomas Tickle, whilst the Sessional Certificates of Honour were taken by Mr. Ernest Goulding, Mr. G. S. Jones, these being equal, and by Mr. Francis Rose.

In the Department of Practical Chemistry, Professor Attfield reports that the number of pharmaceutical students was sixty-nine, being three more than the previous Session, and two above the average of the past ten Sessions. Thirty-nine pupils entered for the whole Session as against twenty-nine last year. The average length of entry of each pupil was 7¼ months as against 6¼ months last year. Most of the pupils worked for three hours daily, a few for four or six hours daily. With regard to the character of the work done, judging from continual observation by himself and his three assistants, by the records of the weekly revision classes, and the results of the two terminal examinations, Professor Attfield was of opinion that on the whole the work done was distinctly better than for several years past. For the Silver Medal and Certificates of Honour thirty-five students competed, the highest on the list obtaining the full number of marks. A Bell Scholar, Mr. Goulding, has taken the Bronze Medal, and Mr. F. G. Parry the Sessional Silver Medal. At the close of the Winter Course the two Certificates of Honour were awarded to Mr. J. W. Mainprize and Mr. Thomas Tickle, whilst the Sessional Certificates of Honour were gained by Mr. W. Moore, Mr. Thomas Tickle, and Mr. C. A. Hill.

In the Department of Botany, Professor Green reports that there were forty-eight students, of whom thirty-three attended both courses. The work of the class was satisfactory throughout. The Bronze Medal was taken by Mr. Tickle, a Bell Scholar, and the Silver Medal by Mr. C. E. Robinson, who also gained the second Certificate of Honour in April, the first Certificate falling to Mr. Goulding. The Sessional Certificates have been awarded to Mr. Francis Rose, Mr. Thomas Tickle, and Mr. Ernest Goulding.

Mr. Ince reports that the courses in the Theory and Practice of Pharmacy have been well attended, the total number of students being forty-one in the winter and twenty in the summer. It is satisfactory to notice that a considerable increase has taken place in the number who attended the additional course of laboratory work in Pharmacy. Forty students attended the winter course last session, whilst only twenty-seven entered in the previous session. Again, fifteen students attended during the summer last session, whilst there were only eight in the previous session. The Bronze Medal has been awarded to a Bell Scholar, Mr. Goulding, and the Silver Medal also to a Bell Scholar, Mr. Tickle.

In Materia Medica, Mr. Greenish reports favourably on the work of the class. There were forty-five students, of whom thirty-three attended during the whole session. Mr. Francis Rose has succeeded in taking both the Bronze and the Silver Medal in this subject. At the end of the winter course the Certificate of Honour was awarded to Mr. William Moore, and the two Sessional Certificates to Mr. Ernest Goulding and Mr. F. A. West. The Staff of the School note with satisfaction that the Lecturer on Materia Medica, Mr. H. G. Greenish, was made Professor of this subject by the Council at the close of last session. This is the only official change that has to be recorded.

The Professors and Lecturers observe with much pleasure that in the open competition for the Council Prizes all three have been awarded to students of this School. A Bell Scholar, Mr. Tickle, has gained the Pereira Medal, a lady student of the School, Miss Tilson, the Silver Medal, and Mr. Francis Rose, to whom several school awards have been made, takes the Bronze Medal. It may be remarked that this is the second occasion on which the Silver Council Medal has been gained by a lady student of the Society's School, it having been taken on a previous occasion by Miss Buchanan.

In another open competition too, a student of the Society's School, a Bell Scholar, has distinguished himself. The Redwood Scholarship, which provides free scientific education beyond examinational limits, has been awarded to Mr. Thomas Tickle. The outgoing Redwood Scholar, Mr. H. A. D. Jowett, has been enabled, through the liberality of the founder of the Manchester Pharmaceutical Association Scholarship, to continue his work in the Research Laboratory for another year. That the advantages, in the form of additional scientific training, which are provided by the Society's Research Laboratory, are appreciated by the younger pharmacists, is clearly evident from the circumstances that there were this time six candidates for the Redwood Scholarship.

The Professors and Lecturers regret to have to record the death during last session of two former Bell Scholars. Mr. William Foster, M.A. Cantab., the Lecturer on Chemistry at Middlesex Hospital, and Mr. H. D. Fuge, who had recently achieved the distinction of gaining a Major Scholarship at Trinity College, Cambridge, almost immediately after leaving the Society's School last year, where he had filled during two years the post of Assistant Demonstrator in Chemistry, and Assistant to the Professor of Botany.

After the reading of the report, the Vice-President apologised for the absence of the President, and explained that, owing to this circumstance, the certificates were not fully signed, and would not therefore be presented on this occasion.

The successful candidates were then called up in rotation and congratulated by the Vice-President, the prizes being at the same time presented.

### List of Prizemen in the School of Pharmacy Competitions.

Charles Alexander Hill.
Certificate of Honour—Session—Practical Chemistry.

Geoffrey Stuart Jones.
Certificate of Honour—Session—Chemistry.

John William Mainprize.
Certificate of Honour—1st Course—Practical Chemistry.

Arthur Frederic Surfleet.
Certificate of Honour—Session—Practical Chemistry.

Joseph Arthur West.
Certificate of Honour—Session—Materia Medica.

Frederick George Parry.
Silver Medal—Session—Practical Chemistry.

William Moore.
Certificate of Honour—1st Course—Materia Medica.
Certificate of Honour—Session—Practical Chemistry.

**Charles Edwin Robinson.**
Certificate of Honour—1st Course—Botany.
Silver Medal—Session—Botany.

**Francis Rose.**
Certificate of Honour—1st Course—Chemistry.
Bronze Medal—1st Course—Materia Medica.
Certificate of Honour—Session—Chemistry.
Certificate of Honour—Session—Botany.
Silver Medal—Session—Materia Medica.

**Ernest Goulding.**
Bronze Medal—1st Course—Practical Chemistry.
Bronze Medal—1st Course—Chemistry.
Certificate of Honour—1st Course—Botany.
Bronze Medal—1st Course—Pharmacy.
Certificate of Honour—Session—Chemistry.
Certificate of Honour—Session—Botany.
Certificate of Honour—Session—Materia Medica.

**Thomas Tickle.**
Certificate of Honour—1st Course—Practical Chemistry.
Certificate of Honour—1st Course—Chemistry.
Bronze Medal—1st Course—Botany.
Silver Medal—Session—Chemistry.
Certificate of Honour—Session—Botany.
Silver Medal—Session—Pharmacy.

### Mr. Hanbury's Gift of Books.

Copies of the 'Pharmacographia' and 'Science Papers,' given by Mr. Thomas Hanbury, in memory his brother, the late Daniel Hanbury, were also presented to the first prizemen in each subject.

Frederick George Parry—1st Prizeman in Practical Chemistry.
Thomas Tickle—1st Prizeman in Chemistry and Pharmacy.
Charles Edwin Robinson—1st Prizeman in Botany.
Francis Rose—1st Prizeman in Materia Medica.

### Pereira Medal and Council Examination Prizes.

Mr. W. M. Holmes read the report of the examiners for the Council Prizes, as follows :—

In presenting the report on the examination for the Council Prizes, which was conducted by Mr. Tanner and myself, I have the honour to announce that fourteen candidates entered for competition, which is rather more than the average number. There are three prizes offered by the Council to be competed for at the end of the session in July; the first consisting of the Pereira medal in silver, the second the Pharmaceutical Society's medal in silver, and the third the Pharmaceutical Society's medal in bronze. The winners of these prizes are also recipients of books to the value of £5, £3, and £2 respectively, the gift of the late Mr. Thos. Hyde Hills. Any pharmaceutical chemist, whether belonging to the Society's School or not, who has passed his Major examination during the session, and who at the time of passing was an Associate of the Society, is eligible to compete. The subjects of examination are chemistry, materia medica, and botany, which, if personified, might be styled the three graces of pharmacy. Some of the papers submitted at the present examination were very good, and gave evidence of intelligent work, which augurs well for the after career of the writers. The first prize, the Pereira Medal, has been awarded to Mr. Thomas Tickle, one of the Bell Scholars for the past session. In looking over the list of Pereira Medallists, I find that of the twenty-nine gentlemen who have gained this distinction no fewer than fifteen have been Bell scholars and one a Redwood scholar. This is a matter of great congratulation to the Society, because, in the first place, it is a proof that the holders of the Bell Scholarship were worthy of the honour conferred upon them, and it is also a clear indication that the course of instruction in the Society's School is established on a thoroughly sound basis. The second prize, the Society's Silver Medal, has been awarded to Miss A. E. Tilson, whose papers showed excellent and painstaking work. In the chemistry paper she was equal to the Pereira Medallist, in itself no slight distinction, and she was not very far behind him in the other two subjects. Miss Tilson is very much to be congratulated upon taking the position in the examination that she has done, and she is an example to others of what may be accomplished by patient and steady work. This is only the second occasion that a lady has gained one of these prizes, and each time it has been the silver medal. Mr. Francis Rose, whose papers on materia medica and botany were excellent, comes in a good third, and the Society's Bronze Medal has accordingly been awarded to him.

The Vice-President then presented the medals and books to the successful competitors, as follows :—

*I. PEREIRA MEDAL (SILVER); and Books of the value of £5, presented by the late Thomas Hyde Hills.*

Thomas Tickle.

*II. PHARMACEUTICAL SOCIETY'S MEDAL (SILVER); and Books of the value of £3, presented by the late Thomas Hyde Hills.*

Annie Elizabeth Tilson.

*III. PHARMACEUTICAL SOCIETY'S MEDAL (BRONZE); and Books of the value of £2, presented by the late Thomas Hyde Hills.*

Francis Rose.

### The Jacob Bell Scholarships.

Mr. F. Ransom next presented the report of the Examiners for the Bell Scholarships. There had been thirty-three candidates, representing fourteen different centres, and no less than seventeen obtained sufficient marks to entitle them to the prize, and there had been no little difficulty in selecting the two best. The successful competitors were—

Thomas Anderson Henry, and
Charles Edmund Ashby.

and the Scholarships had been awarded to them.

### The Herbarium Prize.

The prizes of books, presented by the late Thomas Hyde Hills, in memory of Jacob Bell, having been handed to the Bell Scholars by the Vice-President, he then explained that the Herbarium prize could not be presented this year. No collection of a sufficient degree of merit had been submitted by candidates living in the United Kingdom, though a most excellent collection had been sent in by Mr. Perrédès, of Jersey. This had been presented to the Society's Museum, and could be seen upstairs.

### The Redwood Scholarship.

The Vice-President next announced that Mr. Thomas Tickle had been selected as Redwood

Scholar for the ensuing year, and then called upon Dr. Lauder Brunton to deliver

### The Inaugural Sessional Address,

which is printed at p. 281.

At the conclusion of the address,—

Mr. R. A. Robinson proposed a hearty vote of thanks to Dr. Lauder Brunton for his admirable address. On many previous occasions very excellent addresses had been delivered there by various eminent men, but he had never heard one more full of interest or more admirably conveyed. Dr. Brunton had cleared up a doubt which he had sometimes felt, and led him to the conclusion that the ancients did not cram; for he told them very properly that those who crammed soon forgot their knowledge, and it was quite certain that when the art of distilling whiskey had been once discovered, whether it were in the fourth or the twelfth century, it was never forgotten. One heard occasionally of pharmaceutical students being seen out late at night, but this fact was now explained; they were no doubt searching for the plants which had to be collected at night. Everyone present knew what a distinguished position Dr. Lauder Brunton occupied, that he was one of the foremost men in London in investigating the action of drugs, and his example ought to be an incentive to all the young men present to avoid cram, and they might then hope to become as eminent in their own line as he was in his.

The motion was carried by acclamation, and Dr. Lauder Brunton having briefly acknowledged the compliment, the visitors proceeded to inspect the school arrangements, museum, etc., and to partake of light refreshments in the examination hall.

## EXAMINATIONS IN LONDON.

*October*, 1893.

**Present**:—Mr. Cross, Vice-President; Messrs. Corder, Druce, Fletcher, Gerrard, Greenish, Holmes, Ransom, Saul, Symons, Tanner, and Taylor.

### MAJOR EXAMINATION.

*Eighteen* candidates were examined. *Eleven* failed. The undermentioned *seven* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

| | |
|---|---|
| Arrandale, John Samuel | Denton. |
| Bray, Frederick Richard | Horncastle. |
| Garner, James Norman | London. |
| Horrell, Wm. Foskett Edward | Crediton. |
| Norwood, John Percy | Doncaster. |
| Riley, Joseph Arthur | Seaforth. |
| Sage, Charles Edward | Frome. |

## Parliamentary and Law Proceedings.

### Proceedings under the Pharmacy Act.

Before his Honour Judge Greenhow, at the Leeds County Court on Wednesday last, an action was brought by the Council of the Pharmaceutical Society to recover two penalties of £5 each from John Parker, grocer, of No. 1, Picton Place, Armley Road, Leeds, for having sold oxalic acid and laudanum.

Mr. Grey (barrister), London, appeared for the Council; the defendant was not professionally represented.

Mr. Grey quoted the section of the Act of Parliament under which the action had been brought, and pointed out that oxalic acid, opium, and all preparations of opium, were included in the schedule of the Act.

Ethel Moseley, a girl, living at 10, Cliffdale Street, Meanwood Road, said that on June 3 she went to the defendant's shop, and asked for a bottle of Teasdale's chlorodyne.

While you were in the shop, did you see a white jar?—Yes.

What was on it?—Oxalic acid.

Did you ask for two pennyworth of it?—Yes.

How much did you get?—He said there would be two ounces for threepence, and I bought two ounces.

Is that the parcel you bought?—Yes, sir. [Parcel produced].

Did you afterwards hand it over to Mr. Moon?—Yes.

His Honour (to the defendant): Do you wish to ask the witness any questions?

Defendant: No, sir. We have sold oxalic acid, and we did not know that we were not allowed to sell it.

George Davidson Telfer said that on June 10 he went to the defendant's shop and purchased a pennyworth of laudanum.

Mr. Grey: Did he say anything to you?

Witness: He objected at first. He said he was not allowed to sell it, and if he was found out, he would be fined £50.

Did he take the money for it?—Yes.

What did you do with the bottle?—I handed it over to Mr. Moon.

Defendant (to witness): Who sold you the stuff?

Witness: You did.

Defendant: That is a lie.

Mr. Harry Moon, clerk in the office of the Pharmaceutical Society, said that on June 15 he received the packet and bottle from the two previous witnesses, and retained them in his possession until last Saturday, when he handed them over to Mr. Eastes for analyses.

Mr. Ernest John Eastes, Fellow of the Institute of Chemistry, said that he had analysed the contents of the packet and bottle produced, and had found one to contain oxalic acid, and the other laudanum.

Parker, in defence, said that he had sold oxalic acid since he first went into the shop five years ago, and was not aware that he was prohibited from doing so. It was used for taking stains out of linen. As to the laudanum, he had not sold it. He had been asked for it several times, but had not sold it.

His Honour asked the defendant if he had any witnesses to call.

Defendant said that he could only hand in a number of letters from people who had asked him for laudanum, but they had not got it. [Defendant handed in a number of letters.]

His Honour: There seem to have been a number of people to whom he has refused the laudanum.

A gentleman stepped into the witness box, and said he merely wished to remark that the defendant was a respectable man, and that he thought the Society ought to have given him notice that the sale of patent medicines was prohibited. Mr. Parker had had no notice of that kind, and he thought that the Society was taking a great advantage of him.

His Honour pointed out that the articles sold were not patent medicines, and said that he had no option in the matter. He must inflict a penalty of £5 in each case, with costs. Defendant would have to pay the money at £1 per month.

Defendant: I cannot pay that.

His Honour: That is the order.

The next case was that of Arthur Goodall, of 191, Meanwood Road, Leeds. The case was partly heard on

August 4, when the defendant was represented by Mr. H. A. Child, and was adjourned for legal argument.

Mr. Child said that he had had no further instructions on the matter since the last hearing, and he should not appear further in the case.

Mr. Grey remarked that this was a case of the sale of Powell's balsam of aniseed, which contained morphine, and on the last occasion the whole of the witnesses for the prosecution were examined.

There being no appearance on behalf of the defendant, his Honour gave judgment for the £5 penalty, with an order for immediate execution, it being intimated by Mr. Grey that since the last hearing the shop had been closed.

### CASE OF STRYCHNINE POISONING.

A somewhat peculiar case of strychnine poisoning was last week investigated by the West London Coroner, Mr. Luxmore Drew. Florence Munday, aged thirteen, was employed as domestic servant by Dr. and Mrs. Withers, living in the Talgarth Road, West Kensington. Dr. and Mrs. Withers were aroused one morning by piercing shrieks coming from the lower part of the house, and, on descending, they found Florence Munday writhing in agony upon the floor of the water closet. The symptoms appeared to Dr. Withers to resemble those of a severe epileptic fit, but he deemed it advisable to call in another medical man, Dr. Frederick Alderson, of Hammersmith. The child, however, soon died, and Dr. Alderson, who was assisted by the pathologist of the West London Hospital, proceeded, at the coroner's request, to examine the body. Every organ in the body was found free from signs of disease, and the doctors gave it as their opinion that the girl had died from an epileptic seizure of an unusually severe character. The Coroner, however, adjourned the inquest, and ordered various parts of the child's body to be sent to Dr. Luff, the official analyst to the Home Office. At the adjourned inquest on Wednesday, Dr. Luff deposed that he found in the walls of the child's stomach one quarter of a grain of strychnine, in the liver also one quarter of a grain, and in the kidney one-seventh of a grain. Further evidence revealed the fact that Dr. Withers kept strychnine and other poisons in a cupboard in the breakfast-room, which was locked, though the key was left in the lock. No proof was forthcoming that the deceased had taken anything from this cupboard, and the verdict of the jury was "That deceased died from strychnine poisoning, but that how the poison had been taken there was no evidence to show."

## Reviews and Notices of Books.

**PHARMACOGRAPHIA INDICA. PART VI.** Also, separately, the Index to the whole work, and Appendix. By WILLIAM DYMOCK, C. J. H. WARDEN, and DAVID HOOPER.*

Although Dr. Dymock did not live to see the publication of the final part of the comprehensive work on the materia medica of India which he began in 1888, in conjunction with Dr. C. J. Warden and Mr. D. Hooper, yet he had the satisfaction of knowing that the manuscript of the sixth part was written, as far as he could prepare it. Part VI. commences with the Euphorbiaceæ and ends with the Algæ. A comparison of the present work with the parallel portion of the materia medica of Western India is rendered somewhat difficult by the fact that the natural orders are arranged in a different sequence, and that in cases where the specific name has been changed the synonym in the previous work is not always given, so that it is only by comparing the vernacular names that the drug can be identified in the two works. The botanical source of some of the unknown drugs in the appendix to the previous work has now been made out. Thus the curious soft brown bark called Tejbul, which is kept saturated with water, yet does not seem to become mouldy, has been identified as the bark of the lower part of the trunk and roots of *Excæcaria Agallocha*. A great deal of trouble appears to have been taken to bring the information up to date, as in the case of Badshah salep and *Celtis reticulata*. Concerning the latter, the discovery of skatol in the wood, by Professor Dunstan, is mentioned, and the botanical name, *Celtis dysodoxylon*, given in the previous work, is now changed to *Gironniera reticulata*, Thw. A great deal of folklore is added to the history of the more important drugs, such as *Cannabis Indica*, saffron, and aloes, which makes very interesting reading, and in some cases, as in that of *Verbena officinalis*, in the fifth part, throws considerable light upon the original introduction of some of our native plants and European drugs into the herbals of the older botanists.

The valuable 'Dictionary of the Economic Products of India,' by Dr. Geo. Watt, has evidently been freely drawn upon, and the details concerning the uses of some Indian drugs, quoted from the "special opinions" of medical men all over India, given from their personal experience at Dr. Watt's request, may here be perused with advantage by those who have not access to the larger work. European medical journals have also been made to contribute their quota of valuable information. Thus the use of Indian hemp as a local anæsthetic in dentistry is mentioned, as many as twenty-two teeth and stumps having, it is stated, been extracted by its use at one sitting, and in senile insomnia it is said that nothing can compare in utility with moderate doses of Indian hemp. The article on salep includes much new information, and the botanical sources of the different varieties of the Indian drug have been determined with greater accuracy than hitherto. It is instructive to learn that the stems and pseudo-bulbs of *Dendrobium Macræi* have been found to contain an alkaloid, since several species of this genus are used in medicine in China, and it would thus appear that there is some basis for belief in the medicinal properties of plants of this genus. The article on cardamoms is considerably extended, occupying eight pages instead of two, and containing useful information concerning the cultivation and commerce of the drug. The banana (*Musa paradisiaca*) also receives a large share of attention, more, perhaps, than is warranted by its use in medicine.

Under aloes a curious derivation of the word socotrine, or succotrine, is given, suggested by M. Mowat in 'Alphita.' He connects them with the Greek word sukōtos (*συκωτός*) = Lat. ficatus = It. figato. This word seems originally to have denoted the liver of a goose fattened on figs, and the word *socotrinum* or *succotrinum* applied to aloes would therefore be the equivalent of *(h)epaticum*. Nearly eight pages instead of two are devoted to the cocoa nut, which is perhaps due to the importance of the fruit as an article of commerce quite as much as to the superstitions which are attached to its medical use in India. To *Areca Catechu* ten pages are given, which include a full account of the information recently published on the chemistry of the drug. Some idea of the quantity of areca nut used in India may be formed from the statement that in addition to its own produce India imports 30½ million pounds of the nut. *Saccharum officinarum* is honoured with eight pages, and a useful summary of information is contained in these pages. It will thus be seen that dietetic articles receive a large share of attention. In fact, 'Pharmacographia Indica' will be found a most useful repertory of information concerning not only the drugs of our Eastern Empire, but also many articles which are not strictly medicinal, but are also of considerable economical interest, and as references are usually given to further sources of information, the work should find a place in the library of every pharmaceutist who possesses one of works of reference. 'Pharmacographia Indica' must inevitably remain the classical work on Indian drugs for many years to come, for although additions may be made to the chemistry of many of them, it is perhaps only once in a generation that a man arises who possesses the proficiency of the late Dr. Dymock in Eastern languages, and who occupies at the same time a position in which they can be turned to account in throwing light upon the materia medica of the East. As his coadjutor states in the obituary notice, "He was the greatest pharmacognosist in this country (India), and many besides ourselves will mourn that such a useful career was so suddenly terminated.

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* London: Kegan Paul, Trench, Trubner and Co., Limited.

The index to the 'Pharmacographia Indica' extends to eighty-three pages, and has been issued in a separate volume, which also includes an appendix to the work. The latter gives in brief the substance of work done in investigating a number of, plants and plant-products, reports of which have been published during the progress of the 'Pharmacographia Indica.' The larger proportion of these seem to have appeared originally in the *Pharmaceutical Journal*, and others have been referred to in its pages. There are over one hundred and twenty pages in this appendix, and the authors express their intention of publishing supplementary volumes of the work as material becomes available.

### SCIATIC NEURITIS: ITS PATHOLOGY AND TREATMENT. By ROBERT SIMPSON, L.R.C.P., L.R.C.S.[*]

This tract of forty-six small pages contains an account of its author's method of treating the painful symptom known as sciatica. It consists of a combination of massage and electricity. A very large portion of the book is occupied with a description of the pathology of neuritis.

### THE ESSENTIALS OF CHEMICAL PHYSIOLOGY, FOR THE USE OF STUDENTS. Illustrated. By W. D. HALLIBURTON, M.D., F.R.S.[*]

This book is an exceedingly lucid exposition of the chemistry of the animal body, treated in an elementary and practical manner. It is rather remarkable that so little attention is paid by pharmacists to this branch of chemistry, considering the important position it has attained in the modern theory and practice of medicine. The knowledge which might be acquired by reading and working through the practical portions of the book under consideration would be found extremely useful by the pharmacist, who has many opportunities of assisting the physician in this direction. The book is divided into two parts, elementary and advanced. The elementary course comprises twelve lessons, in which are described carbohydrates, fats, and proteids, the principal food stuffs, the digestive secretions, bile, blood, and urine. Each lesson consists of a practical portion, containing concise directions for carrying out experiments illustrative of the subject matter of the lesson, followed by a descriptive account of the same. At the end of the course a very useful summary of tests and a scheme for the detection of physiological proximate principles is given. The advanced course contains fourteen lessons, and is simply an extension of the elementary course and of a more abstruse nature. The lessons are chiefly practical. Those on urine should be particularly useful to pharmacists. They contain directions for the determination of the chief constituent required for clinical purposes, and the processes have been carefully selected in all cases. An appendix contains, among other things, descriptions of various instruments having special application to the methods of chemical physiology; particularly those used for the determination of the quality of blood and sugar in urine. The name of the author is a sufficient guarantee that the information has been brought well up to date, and the work may be strongly recommended to those desiring a closer acquaintance with this branch of chemistry than may be obtained from the ordinary text-book.

### TOOTH EXTRACTION; a Manual on the Proper Mode of Extracting Teeth. By JOHN GORHAM, M.R.C.S. Fourth Edition.[†]

This little book contains some useful tables, but the methods advised by the author to be adopted in difficult cases of extraction are certainly not in accordance with modern teachings; for instance, on page 18 it is stated that teeth which are decayed down to the level of the gum can be removed "by folding a narrow strip of lint over both sides of the gum, including the fang surface, and applying the blades of the ordinary lower molar-forceps so as to include fang, gums, lint, and all within its grasp." No doubt the patient would fully appreciate this barbarous method. And, again, to advise the use of the elevator for upper wisdom teeth is decidedly wrong.

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[*] Bristol: John Wright and Co. Pp. 1 to 46. 1*s*.

[*] London: Longmans, Green and Co. Pp. i.-xi., 1 to 166. 5*s*.

[†] London: H. K. Lewis. Fcap. 8vo. Pp. i.-xvi., 1 to 40. 1*s*. 6*d*.

**Indigestion, Gout, Corpulency, and Constipation.** By **Thomas Dutton, M.D.** Third Revised Edition.*

**The fact that a third edition of this work is required is sufficient evidence that it has met with a favourable reception. This is very largely due to the simple style in which the book is written, and the lucid manner in which the author describes the methods by which dyspeptics should regulate their dietary.**

## Obituary.

### THOMAS FAIRGRIEVE.

We have to record the death of Mr. Thomas Fairgrieve, at The Cottage, Ormiston, on Saturday, 30th ult., in his seventy-fourth year. Mr. Fairgrieve was a native of Edinburgh, and served his apprenticeship with his uncle, Dr. James Laurie, to whose business, at 46, Clerk Street, Edinburgh, he ultimately succeeded in the year 1840. He was a member of the Pharmaceutical Society from 1852 till 1888, when, owing to failing health, he sold his business to Messrs. Glass and Innes, and retired to the village of Ormiston, near Edinburgh, where for many years he had carried on the cultivation of medicinal plants. His name has become widely known in connection with the production of lactucarium, which he collected from *Lactuca virosa*, var. *montana*, and with which he supplied the London wholesale market until the smallness of the demand compelled him to abandon the cultivation. His method of collecting the drug, published in the *Pharmaceutical Journal* ([3], iii., p. 972), is quoted by nearly all writers on materia medica. He also devoted considerable attention to the cultivation of hyoscyamus, and had observed that the seeds of biennial plants produced both annual and biennial plants.

Notice has also been received of the death of the following:—

On the 22nd of September, Isaac Wilson, Chemist and Druggist, Oswaldtwistle. (Aged 38 years).

On the 25th of September, Frank Wild, Chemist and Druggist, Manchester.

On the 25th of September, Robert John Smith, Chemist and Druggist, London. (Aged 46 years).

On the 25th of September, William Stevenson, Chemist and Druggist, Sheffield. (Aged 70 years).

On the 27th of September, Charles W. H. Llewellyn, Chemist and Druggist, Hitchin. (Aged 59 years).

On the 27th of September, Francis George Hall, Chemist and Druggist, Newbury. (Aged 59 years).

On the 29th of September, Alexander Wilson, Chemist and Druggist, Greenock. (Aged 30 years).

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### Detection of Eserine.

Sir,—In view of the discussion on this subject, it is perhaps worth mentioning that the simple test with nitric acid and alkali, which I described incidentally during a debate on a paper by Mr. MacEwan some years ago (*Pharm. Journ.*, [3], xvii., 642), is extremely convenient to apply, and of very considerable delicacy. An aqueous solution of a salt of the alkaloid is heated to boiling, and then some strong nitric acid added. The yellowish or orange solution thus obtained, when supersaturated with sodium hydroxide, assumes a beautiful violet colour of remarkable intensity. On acidulating the solution the violet colour is discharged, to be restored on the addition of more alkali.

*London.* J. E. Saul.

### Dispensing Difficulty.

Sir,—Re dispensing difficulty. The article dispensed was antimonious chloride, and should have been described as being of a deliquescent nature. By not doing so I have, no doubt, misled some of your readers. "E. M. B." seems to have an idea that terchloride of antimony is the higher chloride. I can draw no other conclusion from his sarcastic query concerning hyd. perchlor. and hyd. chlor. Your correspondents "Assistant" and "E. M. B.," should they turn to some standard works of reference, say Fowne's 'Chemistry,' or Martindale's 'Extra Pharmacopœia,' will see that they are somewhat misled as to what true butter of antimony is. "J. T. W."

*Kappa.*—We are unable to furnish the information you ask for.

*F. C.*—Apply to the Secretary, Inland Revenue Department, Somerset House.

*Richmond.*—We will make inquiries on the subject.

### NOTICES OF MEETINGS NEXT WEEK.

Tuesday, October 10.

*Gresham College, London*, at 6 p.m.
"The Organs of Speech," by Dr. E. Symes Thompson.
*Royal Victoria Hall, London.*
"A Total Eclipse of the Sun," by Professor Thorpe.
*London Institution*, at 6 p.m.
"The Principles of Geography as Applied to Commerce," by Dr. H. R. Mills.

Wednesday, October 11.

*Gresham College, London*, at 6 p.m.
"The Mechanism of Speech," by Dr. E. Symes Thompson.

Thursday, October 12.

*Sheffield Pharmaceutical and Chemical Society.*
Opening of the ninth session of the School of Pharmacy, at 6 p.m. Inaugural address by Mr. John Harrison, J.P., of Sunderland. Annual dinner at the Masonic Hall, Surrey Street, at 7.45 p.m.
*Chemists' Assistants' Association.*
Musical and Social meeting, at 8.30 p.m.
*Gresham College, London*, at 6 p.m.
"Disorders of the Vocal Organs," by Dr. E. Symes Thompson.
*Glasgow and West of Scotland Pharmaceutical Association*, at 9 p.m. Inaugural meeting for the Session. Addresses by the President, Mr. W. L. Currie, Dr. William McLennan, and others.

Friday, October 13.

*Gresham College, London*, at 6 p.m.
"Management of the Voice," by Dr. E. Symes Thompson.

Saturday, October 14.

*Pharmaceutical Football Club* v. Wanstead Colts, at Shepherd's Bush.
Reserves *v.* Wanstead Colts Reserves, at Snaresbrook.

### BOOKS, ETC., RECEIVED.

The Essentials of Chemical Physiology, for the Use of Students. Illustrated. By W. D. Halliburton, M.D., F.R.S. London: Longmans, Green and Co. Pp. i.-xi., 1 to 166. 5*s*. From the Publishers.

Petroleum. By Dr. D. de Loos. From the Colonial Museum, Haarlem.

Bericht von Schimmel & Co., in Leipzig. October, 1893. From the Publishers.

Wright's Improved Physicians', Surgeons', and Consultants' Visiting List for 1894. Compiled by Robert Simpson, L.R.C.P., L.R.C.S. Bristol: John Wright and Co. 5*s*. 6*d*. From the Publishers.

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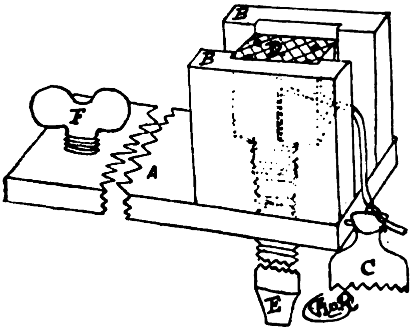
* London: Henry Kimpton. Pp. i.-xi., 1 to 220. 2*s*.

## A NEW MICROTOME FOR GENERAL PRACTITIONERS AND PHARMACISTS.

BY GORDON SHARP, M.B. EDIN.,
*Ashton-under-Lyne.*

In the Journal for June 24 last, there appeared a drawing of a simple microtome for cutting vegetable sections. When I had read that article I thought if my microtome, which is as simple as possible, and was made for me by a country joiner, for cutting pathological sections, were modified for vegetable sections, a rough sketch would be useful. Mr. P. W. Ruston, of Ashton-under-Lyne, has done this, and has also made a drawing of the instrument. The total cost, including ether spray, is under five shillings, and the directions are so simple as to be easily followed by any joiner. Fig. 1 represents the complete microtome; Fig. 2 the attachment for pathological specimens; Fig. 3 that for vegetable substances.

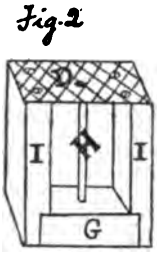


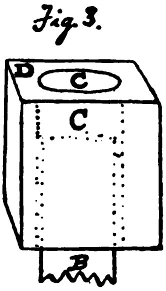
1. The G. P. P. Microtome.

In Fig. 1 the base A is represented as cut short to save space. It should be 8 inches long, 3 broad, and 1 thick. F is a ⅝ inch screw to fasten the base A to a bench or table. BB, the two up-rights, 2 inches by 2 inches and ¾ inch thick, are fastened to the base A by means of strong screws. On the top of BB two pieces of window glass, ⅞ inch by ½ inch, are fixed by means of melted shellac. These form a smooth surface on which the cutting instrument glides. D is the top of the freezing stage to be described under Fig. 2. E is a ⅜ inch screw (cut short to save space) to move the stage upwards. C is the bottle of an ordinary ether spray. The tube is seen carried into position right under the middle of the top (D) of the stage, ready for use.

The stage used in freezing pathological (or other) specimens (Fig. 2) has two sides, I I, 1¾ inch by 1 inch, and 1/16 inch thick. G is the base, 1 inch by ⅝ inch, and ½ inch in thickness. D is the top of the stage, made of zinc, and scored as seen in the drawing. It is fastened to I I by means of four fine screws. I I are similarly fastened to G. H is a piece of stout wire passing between G and D to give greater support to the latter. The specimen to be frozen is, after preparation, embedded in thick mucilage, dropped on D, the stage pushed well down, and the spray slowly worked. One fluid drachm of ether should be quite sufficient to freeze a piece of tissue the size of a large bean.

The stage for vegetable sections (Fig. 3) may be a cube, 1 inch by 1 inch by 1 inch, hollowed out to receive a brass tube, C, having a diameter of half an inch. B is a wooden plug fitting into C, which, on the screw E being turned to the right, moves the section upwards. It should be a little longer than the brass tube. This stage, like that represented in Fig. 2, moves up and down in notches or checks made in BB (Fig. 1). In use, it is to be put in position in the notches, E (Fig. 1) then screwed down, and the specimen, embedded in celluloid or wax, placed on the top of the plug B, and inside the tube C. A razor or sharp knife is to be used, and the screw E slowly turned to the right as the sections are cut off.





2. Freezing Stage for Pathological Specimens.
3. Support for Vegetable Tissues.

It is somewhat a disadvantage that the stages can only be moved upwards by the screw, but this is easily got over by having them pushed down to begin with. In a cheap instrument one cannot have every advantage. All the wooden parts are of bay wood except the screw E, which is of beech wood. In ether freezing it is better not to have the stage too tight fitting (in the notches of BB), else, if used for four or five sections at one time, the wood swells and the stage is difficult to move.

I have named the instrument the "G. P. P. Microtome" because it is suitable for use by both the general practitioner and the pharmacist.

## THE MELTING POINT OF COCAINE HYDROCHLORIDE.

The August number of Liebig's 'Annalen'[*] contains an article by Dr. O. Hesse in reference to the statement of Kinzel, already noticed in this Journal,[†] that the melting point of purified cocaine hydrochloride is upwards of 200° C. Dr. Hesse points out that according to the observations of Antrick,[‡] Einhorn, and Marquardt,[§] the melting point of pure cocaine hydrochloride was found to be 181°·5 C., and that he had not found it to exceed 186° C.[‖] The presence of cocamine hydrochloride in small proportion, or of small quantities of the solvent from which the salt has been crystallised, reduces the melting point to 180° C. This is confirmed by the results of further trials. At 186° C. the salt begins to decompose with frothing, methyl chloride and benzoate being given off, while the residue consists of a mixture of benzoic acid and anhydroecgonine. From correspondence with other observers who have arrived at the conclusion that the melting point of cocaine hydrochloride is above 200°, Dr. Hesse has ascertained that they have determined the melting point in a bath of sulphuric acid, and he attributes to that circumstance the higher results observed. In support of this opinion Dr. Hesse refers to the melting point assigned by E. Schmidt* to the gold salt of Bender's alkaloid, which was sixteen degrees higher than that observed by himself, a difference as great as that between the temperatures given as the melting points of cocaine hydrochloride. These different results are attributed to the inferior conductivity of the substances, in consequence of which they do not acquire the same temperature as the sulphuric acid. To some extent also it may be due to the circumstance that the substance is in an air-bath, while the mercury bulb of the thermometer is in direct contact with the sulphuric acid. In Roth's apparatus that difference of conditions does not exist, and that apparatus is used by Dr. Hesse for taking melting points. But even with a sulphuric acid bath it may be seen that the melting point of cocaine hydrochloride does not exceed 186° C. If the temperature is raised very slowly and the thermometer used has not a very small bulb, the melting point will be found to be 186°, but by heating more rapidly and using a thermometer with a very small bulb the melting point of the salt will appear to be from 188° to 190°, and may even be raised above 200° C. Regard should therefore be paid to the influence of such conditions in taking melting points in order to avoid discrepancies which are more apparent than real.

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[*] *Annalen der Chemie*, 276, 342.
[†] *Pharm. Journ.*, [3], xxiv., 204.
[‡] *Berichte*, 20, 311.
[§] *Ibid.*, 23, 478.
[‖] *Pharm. Journ.*, [3], xxi., 1110.

## OPIUM TRADE OF CHINA.†

(*Concluded from page* 288.)

### SHANGHAI.

Owing to the short crop in India, and the consequent reduction in the amount of Bengal opium offered at public sales, the price of the drug rose rapidly during the year. This appears to have had the effect of checking the consumption, the deliveries being some 2000 chests than they were in 1891. The import of Malwa opium increased slightly during 1892, but that of Patna and Benares fell off by some 1500 piculs. The amount of native grown opium brought to Shanghai for local consumption has increased considerably. From the province of Szechuan as much as 2093 piculs have been imported in foreign vessels and passed through the custom-house, against 179 piculs in 1891. The quality of native grown opium is reported to have improved very much within the last few years, and it is now to be found in all the opium divans in Shanghai. The rise in price of the foreign drug has doubtless stimulated to some extent the use of the native article, but it is apparent that there is a gradual displacement going on all over the country of foreign in favour of native opium. The demand for foreign opium nowhere shows a tendency to increase. At best it but holds its ground, and in some places, as, for example, the northern ports of China, it has practically disappeared from use altogether. On the other hand, the area over which native opium is used and the extent of its cultivation would appear to be yearly widening. Once native opium has gained a foothold and commended itself to the taste of consumers, its cheapness ensures a continuance of the demand, and there is no going back to the Indian drug. No immediate falling off, however, in the consumption of Indian opium to any great extent is to be apprehended.

### TAMSUI.

A large quantity of foreign opium was re-exported, or rather returned as unsaleable.

### TIENTSIN.

Here the importation of Indian opium is on the increase; but that of the native drug is increasing also, and is said to represent 75 per cent. of the whole.

### WUHU.

Foreign opium was stationary, and there was a decline in the consumption of the native drug, the Kiangsu crop having been seriously damaged by rains.

### GENERAL REMARKS.

According to the reports of the Chinese Imperial Maritime Customs, the import of foreign opium showed a falling off of 6663 piculs. The Indian Government having curtailed the quantity of Bengal opium sold at the monthly auctions, reduced importation and enhanced prices; but the stock bonded in China at the beginning of the year was quite sufficient to meet any demand on account of the diminished supply from India. The cheap Persian variety, including so-called Turkey opium, has advanced in favour, and is largely used for mixing with the Chinese drug.

The decline in the importation of Indian opium will please those moralists who so strongly oppose it, and so earnestly advocate the complete extinction of the trade. It may possibly, however, not be entirely satisfactory to note that the decrease in this import is supplied by the cheaper Persian and native drugs, the importation and production of which are largely increasing. Now the Indian drug is unquestionably purer and less noxious in its effects than the inferior qualities with which it is mixed or which take its place. If smokers are compelled to resort to the cheaper and worse kinds they will consume more in order to make up for the want of the better and stronger quality. Opium smoking is a habit so ingrained in the Chinese that it will not be abolished by the exclusion of one particular sort, and if the wealthier and upper classes are driven to use the inferior opium it naturally follows that a corresponding deterioration of mental and physical health must ensue. It is a known fact that the vile mixtures of sesamum seed and opium of the poorest and worst quality used by the lower classes have far more deleterious consequences than the pure Benares or Malwa opium, reserved as a luxury for the rich. The importation in one year of over 15,000 ounces of morphia at Shanghai—not for medicinal purposes, but instead of opium—is a very significant point in this argument. The exclusion of the best opium from the market resembles to a great degree what might happen were the importation into England of good French cognac to be prohibited on grounds of temperance and morality; whilst inferior brandies were coming in from other quarters to supply the want of the better stimulant, and the manufacture of inferior native spirits increasing in proportion to the lack of an article to which well-to-do people are accustomed.

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* *Apotheker Zeitung*, 1890, p. 186.

† From Consular Reports for 1892. See also last volume, page 1028, and present one, page 24.

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### SULPHUR INDUSTRY IN SICILY.

Sulphur has been extracted in Sicily to a greater or lesser extent for centuries, but it is only within the last sixty or seventy years that the industry in this article has come into general and active operation, and though it has formed the subject of previous reports, a further report, dealing with the trade for the last few years, and having regard to the crisis that has prevailed, may not prove uninteresting.

The total number of workmen engaged in the mines in 1891 (32,269) shows an increase over 1890. This is due to augmented production, to searches for mineral in new directions, and to increased pay: this latter circumstance induced the men to work less than usual, and necessitated the employment of extra men. The output of ore per man for the year 1891 was 102·89 tons, but in 1890 it was 109·62 tons, and the yield of sulphur was also less in 1891, the figures being 11·80 tons in 1890, and 10·77 tons in 1891. The value of the produce per man rose from 916·29 fr. in 1890 to 1245·02 fr. in 1891, due exclusively to enhanced prices. The annual average of wages per man went up from 365·02 fr. in 1890 to 427·55 fr. in 1891, and the daily average from 1·78 fr. to 1·99 fr. The difference between the two years would have been greater if there had not been a diminution in the hours of labour in 1891.

The persons working the mines in Sicily are generally termed "esercenti," and are divided into three classes, viz., 1, "proprietors" (owners of mines), 2, "gabelloti" (leaseholders), 3, "partitanti" (contractors). Some proprietors work their mines themselves, while others lease them on what are called "gabelle," and sometimes the proprietors and the leaseholders have their mines worked by "partitanti." The "gabella" of a sulphur mine has all the forms of a special contract whereby the proprietor cedes to the "gabelloto" at the entire cost and charge of the latter the working of a mine for a given period, say nine years or sometimes eighteen years, and even more, under determined conditions; the main one being that the owner shall have, free of all expense and at his choice, a certain proportion, 20 per cent. on an average, known as the "gabella" or rent of the mineral produced. The owner likewise having the option of appointing overseers or inspectors to keep the "gabelloto" within the terms of the contract, to order the suspension of work if deemed expedient, and to direct repairs when necessary, all this, in addition to taxes and dues, to be borne by the "gabelloto" (leaseholder). Amongst other conditions, it is usually agreed that the "gabelloto" shall so work the mines as to leave columns of ore supporting arches (also of ore when the rock above is not sufficiently firm), and the columns themselves resting on beds or heaps of ore called "pasture"—all this ore reverts to the owner when the "gabella" ceases. It is often further agreed that the "gabelloto" must keep and deliver over the mine free of water and earth, must remove the ore by "scale" (stairs), use "calcaroni" (kilns) for smelting, and so forth. The object being that the owner should derive the greatest advantage possible, without being put to the expense of a single "centesimo" (one-third of a farthing).

The "partito" is a verbal agreement without a definite limit of time, *i.e.*, it lasts until one of the parties recedes from it or proposes a change. By this verbal agreement, the working of a mine or part of a mine, the fusion of the ore, the cost of labour, maintenance, etc., are undertaken by a foreman workman for a fixed compensation in money for every "carico" (264 lbs.) yielded. While the mineral is being extracted sums on account are advanced, and settlement is made on final delivery. The "partitante" often takes pickmen into partnership. The supervision of the works is exercised by the owner or "gabelloto" giving out the "partito." The "picconieri," or pickmen, assisted by gangs of boys, known as "carusi," excavate the ore, break up the rock, and heavy pieces of it are carried by the boys to the surface. The men are paid by the "cassa" (a cubic measure) of rock thus carried up. The eduction or pumping of the water is always done by the person having the lease of the mine, and not by the "partitante." The ore on the surface is collected into a pile preparatory to its fusion by "calcaroni" or other means as described further on. When the sulphur has gone through the process of smelting and assumes its commercial form, it is removed by carts or by rail to the outports, and there stored for sale and shipment.

There are five methods of fusing sulphur, but the greater part of the ore at the various mines is still fused by the old method of "calcaroni," or open kilns, owing to the cost of their construction being much less than the adoption of other methods, the loss of sulphur caused by the escaping fumes being very great. The calcaroni are built of masonry, cylindrical in form, with a sloping floor. They hold from 750 to 1000 cubic metres of ore, 1 cubic metre being about 1¼ tons. At the bottom there is a vent hole for running off the molten sulphur into wooden forms. When the calcarone is filled, large pieces of ore are placed at the bottom so that there may be impediment to the "olio" (Sicilian term for molten sulphur) running out, and the work of piling up large heaps between the quadrangular walls goes on, the pieces of ore getting gradually smaller until the top of the calcarone is reached; the ore is there heaped up in the form of a cone, and this is covered with "ginisi" (the calcined refuse from old calcaroni) in order to prevent loss and protect it somewhat from the elements. In order that the crops may not suffer from the sulphur fumes, the calcaroni are only allowed by law to be in operation from June 28 to the end of December, and one fusion of a large calcarone lasts three months.

The "Gill" system, invented by an Englishman, the late Mr. Joseph Gill—improved upon and patented by the late Robert Gill, his son—consists of ovens of masonry similar in form to the calcaroni, but much smaller, and covered in with a cupola in masonry. They are generally built and worked in couples, and each cell contains from 5 cubic metres to 30 cubic metres of ore; they are also built in batteries of four, and the system is this—after being charged, the ore in one cell is set fire to, and the smoke, instead of passing into the open air, as is the case with the calcarone, passes into the adjacent cell and gradually heats the mineral contained therein, until by the time the first cell has finished working, the other has reached such a temperature that the ore ignites, and No. 1 cell is again filled, and so the process goes on. The advantage is that the gases, which are heavily charged with sulphur, are not lost, and the percentage of sulphur recovered is considerably higher; further, the time occupied is much less than with the calcaroni, the working of each cell occupying from 72 to 96 hours, according to its size, and as very little smoke escapes the proprietors can work all through the year. A gold medal was awarded to this system at the National Exhibition at Palermo, 1891-92, and the patents are worked by an English company, under the style of The English Sulphur Fusion Company, with head offices in London, and managed in Sicily by Mr. Robert Rose. About 700 cells are in fusion, and more than 100 in construction. The producers using them number over 200, distributed in about thirty mining districts. The royalties vary according to number of cells, etc., but on an average they are £4 a year per cell. If these royalties were paid, and paid punctually, a good profit would doubtless be the result, but, unfortunately, they are not paid, and almost all the money collected is absorbed by expenses and law suits.

There are three other systems—the "Di Stefano," which is still under trial, I have no description of. The "Fiocchi" consists of wrought iron cylindrical receptacles, rather conical, which are suspended by ears (like cannon); when the apparatus has to be filled with ore it is in a vertical position, and a temporary cover is fixed on one extremity. It is then placed in a horizontal position, and the working cover containing a steam-pipe is then screwed on and made steam-tight. Steam at from 60 lbs. to 80 lbs. pressure is then turned on, which at the outset becomes water, but as this is drained off and the mass of ore becomes heated, the steam becomes dry and the sulphur fuses and is run off into proper receptacles. The apparatus is 4 metres long by 1 metre 20 centims. diameter; three are worked in a row, and each contains 3 cubic metres of ore. Seven fusions are made in twenty-four hours; a steam-boiler of 16 horse-power is required for the necessary steam. This system is adapted for rich ore, or ore that is porous, and the percentage of sulphur recovered is much greater than with the calcaroni, with the great advantage that the sulphur ore can be rapidly turned into commercial sulphur and realised in a short space of time. The cost of this apparatus, about £400, is rather heavy; hence the smaller mine owners prefer the old system of calcaroni.

Finally, there is the "Orlando" system, which is the same as the Fiocchi, but the apparatus always remains horizontal. Four trains, each loaded with about 15 cwts. of ore, are run in on rails, and remain during the fusion, the apparatus is made steam-tight, and steam turned on; the advantage over the Fiocchi system being the greater facility and quickness in charging and discharging the apparatus. The refinery consists of a long oven in masonry, with arched roof, upon which are placed the cast-iron retorts, which are again covered by another arch, upon which are placed cast-iron boxes surrounded by brickwork, and with flues for the smoke and flame from the fire in order to keep them continually heated. Newcastle coals, mixed with wood, in order to obtain an abundance of flame, are used. The fire grate is at one of the extreme bottom ends of the oven, the gases and flames ascend by spiral openings and play all round the retorts, and the smoke ascends by the flues to the cast-iron boxes and from thence to the chimney or stack. The sulphur is put into the cast-iron boxes, where it is fused, and by means of a valve it passes into the retorts, where it is transformed into gas, and thence by a special cast-iron pipe it passes into the condensers, which are cylindrical cast-iron vessels. From the said condensers the refined sulphur, which has again become liquid, passes by a special aperture into cast-iron pans, so that it may gain the required temperature, and from thence it is ladled out into cast-iron forms or moulds of about 1 cwt. capacity, or if roll sulphur is required it is ladled into metallic moulds of the shape it is usually seen in commerce. Sublimed sulphur is manufactured nowadays in an oven, as described for the refined sulphur, but with only two retorts, and the gases, instead of going into the condensers, ascend into a large and specially constructed chamber, lined with bricks. This is hermetically closed, with the exception of a valve in the roof, which opens automatically when the tension produced by the gases is too great for the strength of the chamber, and the gases, as they enter the chamber at the necessary temperature, become immediately solid, and the sublimed sulphur falls into the form of flakes, like snow, to the ground. Sulphur of commerce contains from 2 per cent. to 5 per cent. of impurities, the lower dark coloured qualities, such as good or current thirds, being generally used for refining, owing to their lower price.—*Consular Report*, 297.

## INSECTS INJURIOUS TO DRUGS.*

BY PROFESSOR L. E. SAYRE.

(*Concluded from page* 287.)

About two months ago I placed a notice in the leading pharmaceutical journals of the United States, in which I asked that any insects found destroying drugs should be sent to me in order that they might be studied. As a result, several packages of drugs damaged by insects have been received from different parts of the country, giving an excellent opportunity to pursue the study further. As a result of this latter work I will refer to Plate II.

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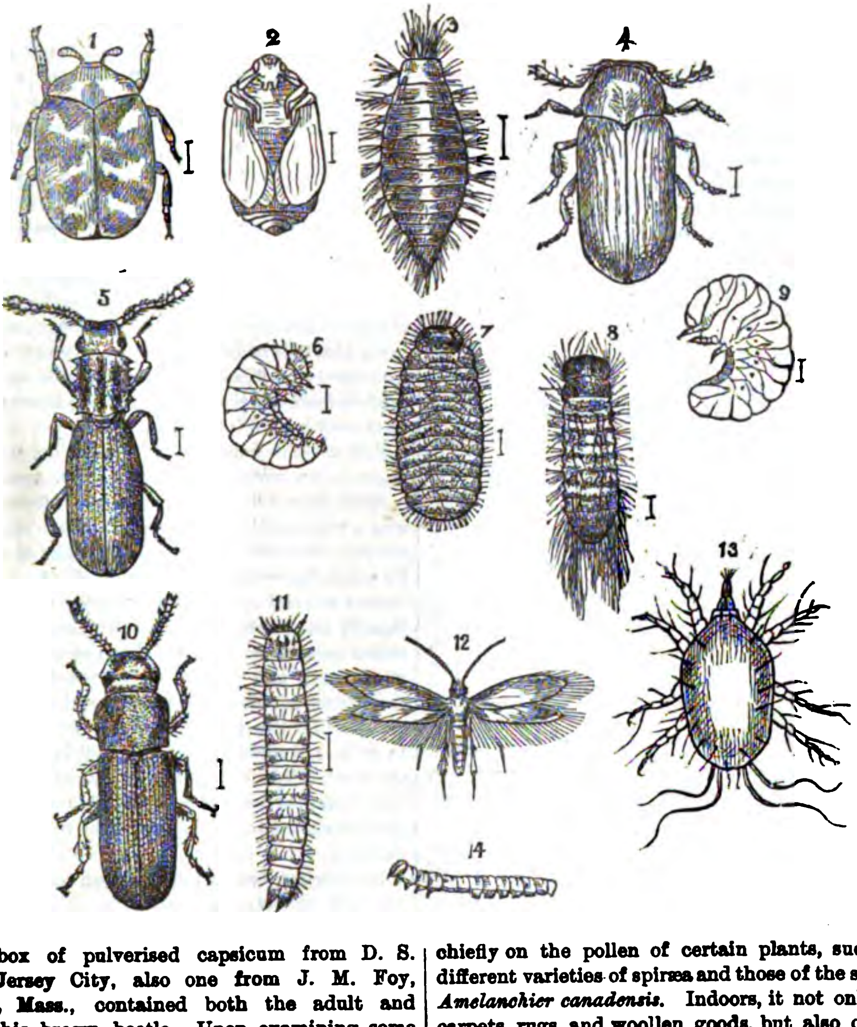
* From the *American Journal of Pharmacy* for July, to the Editor of which we are indebted for the loan of blocks illustrating the paper.

From P. R. Brooks, of Miles Grove, Pa., were received pressed packages of peppermint, marshmallow leaves, skull cap, wormwood, and thorn apple. All of these drugs were infested by a small brown beetle 5 to 7 Mm. in length, 2 Mm. in width, with longitudinal rows of punctures on wing covers, body above and below covered with fine hairs. This insect is known as *Nicobium hirtum* (see Figs. 4 and 9 for adult and larva). When the insect is disturbed, it feigns death, but soon resumes activity and seeks a hiding place. This insect, as far as we have been able to observe, is one of the worst of insect drug pests.



A small box of pulverised capsicum from D. S. Morgan, Jersey City, also one from J. M. Foy, Worcester, Mass., contained both the adult and larvæ of this brown beetle. Upon examining some drugs in stock in the University's Department of Pharmacy, this insect was found in some roots of a bitter character; also, in orris root and ginger root. It is not improbable that this insect may be found attacking any drug containing starch. From Michigan (name of firm and place of residence not given) a package of caraway was received containing the larvæ of some beetles. This larvæ measures about 7 Mm. in length, is white, with pale brown head and body partly covered with short brown hairs (see Fig. 7).

From C. L. Becker and Co., Ottawa, Kan., three packages of drugs injured by insects were received. One of them was a small package of fœnugreek, in which was an insect very closely allied to one familiar to housewives of eastern states, the notorious "buffalo bug." Figs. 1, 2, and 3 show the adult, pupa and larva states respectively of this drug pest. It is *Anthrenus varius*.

Its colour is black and white; sometimes the white is tinged with reddish yellow. The adult insect lives chiefly on the pollen of certain plants, such as the different varieties of spiræa and those of the shad-bush, *Amelanchier canadensis*. Indoors, it not only attacks carpets, rugs, and woollen goods, but also collections of natural history specimens, furs, hair, and drugs. The larva is more destructive than the adult insect.

The second was a small box of Indian turnip. The drug came all right, but the insects had cut a hole through the side of the box and escaped. The third lot was a package of condition powders containing the brown insect, *Nicobium hirtum*, just described.

A box of pulverised marshmallow was sent from Philadelphia. In it were a number of small brown beetles. They were 11 Mm. long and 2 Mm. wide. The long, white larvæ were in the same box, and these are shown in Figs. 10 and 11.

M. Noll, Atchison, Kan., sent an extract of liquorice infected with some small white beetle larvæ, as shown in Fig. 6. From the same firm came a box of almond meal in which were a lot of dark brown beetles, *Silvanus surinamensis*. This beetle is shown in Fig. 5, and is easily recognised by the serrated edges of the portion between the head and wings, its long narrow body, and antennæ enlarged at the tips. Figs. 12 and 14 represent two phases in the life of a moth of the genus Tinea, frequently found flying about among drugs. Fig. 13 shows a little white mite, highly magnified, and seen as small specks on cantharides kept in stock.

So far, only insects attacking drugs proper have been mentioned, but in the investigations some insects have been met with that destroy articles not properly called drugs, but always kept in drug stores. For instance, the larva represented in Fig. 8 is that of a beetle which lays its eggs on bone combs. The grub, on hatching, bores its way back and forth through the substance of the comb until it is made absolutely worthless. Another beetle attacks horn combs, either breaking off the tips of the comb points or cutting through the side.

The observations so far have shown: First, that the most, destructive insects are the beetles or sheathed-winged insects. With the exception of one moth and one mite, all the insects received at the University and mentioned in this article are beetles. Second, that the greater part of the drugs attacked and destroyed are vegetables or vegetable products, and hence that these need the greatest care and watchfulness. Third, that there is need of greater vigilance and more observation on the part of druggists if these pests are to be successfully driven out. One druggist, when asked if he had ever noticed anything destroying combs, said he had never heard of such a thing; but upon investigating his own stock, he found out of a small lot two combs that were destroyed. Yet he could hardly believe that insects are capable of such work.

I shall have nothing to say in this article as to the means of prevention and the use of repellents such as have been frequently suggested in current pharmaceutical literature. It is my desire to enter this field of investigation, and anything that the druggists of the United States can do to aid in the matter will be appreciated. Attention must be given to the life history of some of these insects. We should know what materials the insects breed in, what time they deposit their eggs, and make all the observations possible. From these notes a systematic study of the pests can be made, and results of practical value can be obtained. The Swedes, in the time of Linnæus, alarmed at the way in which their ship timber was being destroyed by a certain larva, applied to the noted naturalist for aid. He told them that if they would sink their ship timber in the sea during the month of May, they would be bothered no further by this larva, for the beetle which is the parent of the grub deposits its eggs in the timber in the month of May, and at no other time of the year. If we had a more comprehensive knowledge concerning the habits and life history of insects injurious to drugs, it is very probable that easy means of preservation and prevention of destruction by insects might be used.

## PHAGOCYTOSIS.*

BY HAROLD C. ERNST, M.D.

The idea of presenting a paper upon the subject of phagocytosis suggested itself to me some time ago; for it had seemed to me, from certain incidental conversations, that perhaps too little attention was being paid to facts that are being brought out in connection with it.

This idea has been strengthened by the publication of the volume upon 'La Pathologie Comparée de l'Inflammation,' containing the lectures by Metschnikoff, delivered at the Institute Pasteur two years ago. Of course, much has since been done, but, so far as the facts there related have to do with phagocytosis, this work is in very much the direction of that which preceded it, and a short review of the whole subject does not seem to be uncalled for.

This book of Metschnikoff's appears to mark an epoch in comparative pathology, and yet very little attention has been paid to it. Although, as the author says, the theory of phagocytosis is not explained in its entirety in it, nevertheless there is enough of the subject included to amply repay the labour of perusal, to those who are interested.

Before coming directly to the subject matter of the paper, a few words of explanation are necessary.

Ever since the knowledge of the infectious diseases was so enlarged as it has been by bacteriological studies, explanations have been sought of the methods by which bacteria are disposed of in the living animal tissues when they have once effected an entrance; and equally has a solution of the phenomena of immunity, either natural or acquired, been searched for. These phenomena can depend only upon some property of the tissues attacked, that renders them an unfavourable soil for the development of the bacteria seeking to gain an entrance—a fact that is easily proved by the toxic effects of sterilised cultures when introduced into animals that are insusceptible to the effects of the living bacteria from which these cultures are derived.

As offering some explanation of the facts that are matters of common knowledge—the conditions of immunity and the commoner ones of recovery from infectious disease—there have been a number of theories advanced, and supported with more or less vigour and ability.

The bacteria are known to produce their effects in several distinct and definite ways: (1) by mechanical obstruction pure and simple; (2) by abstracting from the tissues of the body the material necessary for their own development, and, by so much, depriving the tissue-cells of nutrition necessary for their development; (3) by the production, during their growth, and, either by direct exciting metabolism, or, as the result of the chemical affinities of the elements left in unstable equilibrium after those necessary for the bacteria have been extracted, of new chemical compounds that are destructive to their own further activity, or even to their further existence.

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* Read before the Boston Society for Medical Improvement, April 10, 1893. Reprinted from the *Boston Medical and Surgical Journal.*

These processes being generally known to occur—the actual destruction of the bacteria or the limitation of their activity, going so far, as to make this latter none at all — have been explained upon several grounds.

Immunity—using the term generally, to express any degree of limitation of the activity of bacteria—has been explained upon the ground that (1) the bacteria during their growth in the living tissues produce the loss of some material in the tissue cells that is necessary for bacterial development, and that this loss is not supplied to the tissue-cells for a definite period of time, this time varying in length and covering the period of "immunity" of the individual organism against that special disease. This supposition is purely theoretical, and very little evidence of any kind has been brought forward to defend it. (2) The bacteria are supposed to produce, during their development, and in the same way as they produce the elements hurtful to the tissue-cells, certain other elements, or rather compounds, that are destructive to their own development and existence, and these new compounds, the result of bacterial development, are eliminated from the living organism only slowly; so that during their elimination and during their presence only, the organism is protected against a second invasion of the bacteria—in other words, for that length of time is immune against a second attack of the disease. If this supposition be correct, and if these substances are the result of the development of the bacteria, it offers no explanation of the existence of these immunising substances in animals naturally immune to any special disease—at least, no more explanation than that offered by the immortal "Topsy" for her own existence, that "she growed." Nevertheless, a reference to Behring's latest publication, "Die Blutserum Therapie," in which his theories in regard to the occurrence of immunity are elaborated, will show that there is a strong tendency to neglect, in the light of the more recent researches, all that has gone before, or, if the suspicion may be given expression, much that has not been done in Germany. The author, in seeking to show the various methods that have been adopted for procuring immunity, gives the following tables, that furnish a satisfactory summary of the subject:—

I. Showing the method of action of the agent producing immunity. It occurs (1) by the destruction of the living cause of the disease; (2) by hindering the growth of this living cause; (3) by the destruction of its infectious properties (which result, according to Behring, is effected by the taking away from the bacteria of their power of producing their poisonous products); (4) by the destruction, in the infected organism, of the poisonous material produced there; (5) by such a change of the central organs or of the living cells, that they obtain a higher degree of resisting power against the nerve toxines and cell toxines produced by the bacteria.

II. The conditions necessary for the production of immunity are as follows: A, a passive state of the organism (exhaustion theory and the theory of non-favourable culture medium); B, a functional state of the organism, divided into (1) a function of the living condition of the organism (the contest theory), and (2) a function of the dead condition of the organism.

The question of whether phagocytosis plays any part in this process is completely ignored, unless it be what is meant by the expression "the contest theory;" and certainly no stress is laid upon it, nor is it considered in any of the statements made during the course of his book.

So much and such excellent work has been done upon this part of the subject, however, that it is not possible to ignore it entirely—as many of the workers of to-day are inclined to do—and even with the brilliant results that have been reached by methods, of which phagocytosis probably does not form a part—exemplified in this work upon "Blud-serum Therapeutics" of Behring and others, there remain many processes occurring in the natural course of disease, in which this especial property of the cells must be reckoned with.

The theory of phagocytosis is simply this—that in many of the processes that follow the introduction of bactèria into living tissues, certain cells of the fluid and solid tissues of the body act as actual phagocytes; they possess the property of collecting about the invaded region, and of englobing and destroying, by absorption, the living bacteria, that without their interference would flourish, gain access to other portions of the organism, and produce an attack of an infectious disease.

The cells that are possessed of this power do not, as is often stated, come solely from the leucocytes (the white blood corpuscles), but under certain conditions and in certain diseases, perhaps in all, some at least are produced from the fixed cells of the surrounding tissue; and in such case they have characteristics that make them easily recognisable.

One of the first results of experimental work that called attention to this englobing property of certain cells seen in inoculation experiments, was that following the employment of injections of anthrax bacilli in animals that were susceptible and in those that were insusceptible to attacks of the bacilli. In the first case, that of the susceptible animals, few leucocytes were found at all, and those that were present were not found to contain any bacteria; in this case the micro-organisms were found in enormous numbers in the blood-vessels, but lying free in the blood-current An entirely different appearance presented itself, however, when the same bacteria were injected into animals that were immune to their attacks. In this case there was found a much larger number of leucocytes, and they were seen to be crowded with large numbers of bacilli; whilst none, or almost none of the bacteria were to be found in the blood-current or in other parts of the body than that in which they had been introduced. This appearance was found to be present, not only in animals that were possessed of a natural immunity to anthrax, but in those that had been made artificially immune as well. The natural sequel, therefore, was that this complete contrast should have attracted attention, and should have been seized upon in order to explain, not only immunity pure and simple, but the destruction of the bacteria in the body and the recovery from an infectious disease as well.

It is to Metschnikoff that the first statement and amplification of this theory is due (and, lately, to certain of his followers and proselytes also); and his assertions have been supported by the most brilliant series of minute and painstaking investigations of recent years.

Starting with known observations, made during many years upon unicellular organisms, he sought to apply the results of these observations to the single cells of more complex beings. It has long been known that the unicellular plants are capable of engloбing granules of pigment, which remain for a longer or shorter time in their interior, and that soluble substances, taken up in the same way, would disappear gradually, and that it is in this way that nutrition is obtained. Observations were further made, showing that in not exceptional cases these same single-celled organisms were capable of engloбing living bacteria, and that bacteria thus taken up would gradually disappear in the same way as did the particles of nutritious material; the characteristics of this disappearance being a gradual paling of the rod, a granular appearance, and finally its complete fading from view.

These phenomena were seen to be of regular occurrence, not appearing as variations and unusual accompaniments of special conditions; they were distinctly a provision of Nature for the nutrition of the amœbæ, and for their protection against the attacks of hurtful agencies.

At the same time, the action was so similar to what has already been said had been observed in the case of animals immune to anthrax when inoculated with the bacilli of that disease, that it was inevitable that a comparison should be drawn between the two, and a similarity of action sought to be established. To carry out the idea, the living tissue is to be looked upon as a collection of single cells, certain of them endowed with the power of independent action under certain circumstances. Under most of the conditions of vitality, of course, there is, and must be, a certain oneness of life, necessary for the higher vitality of the organism of which they are but constituent parts; but under exciting force of differing kinds this unity is done away with, and to some classes of these cells of living tissue is ascribed the duty of protection and repulsion that may be carried out in various ways.

Therefore, the fundamental idea of phagocytosis is that living multicellular tissue is to be looked upon as a collection of single cells capable of individual action, in classes, under special circumstances. This being the case, it remained to show if any of the cells of complex tissue had this power of independent action; and the question did not need to be asked long before an affirmative answer could be made. In fact, it had already been made, in the researches of Cohnheim and all his followers, upon the migratory powers of the white blood-corpuscles in response to any irritation of the hurtful kind; and all that was at the time known in regard to these bodies was in the nature of a prop of any theory that explained this responsive action by a tendency towards resistance to an invasion of hurtful elements. But at first the idea was that their migration was simply for the building up of a protective wall against the further advance of the attacking force, the nature of which was not at all understood until modern methods of bacteriology came into use. Then only did the conception occur, that there might be something more in the part played by the leucocytes than a simple negative opposing force, and the development of this conception led to the experiments upon phagocytosis.

(*To be continued.*)

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## THE KADAMBA TREE.

This tree is indigenous to Ceylon, and is known among botanists as *Anthrocephalus Cadama* (the Kadamba of the Tamils). It has an erect stem with many branches; the flowers, which have a peculiar sweet smell, forming a small globe. The fruit is about the size of an orange: this is eaten by the poor natives in India, while the leaves are given to cattle as fodder. The bark is considered to be of great value as a febrifuge and tonic; its taste is bitter and astringent. The fresh juice of the bark is applied to the fontanelles of children when that soft portion of the head sinks; at the same time a small quantity mixed with cumin and sugar is given internally. The juice of the bark mixed with an equal quantity of lime juice, opium, and alum has been applied with great benefit round the orbit of the eye to subdue inflammation. The tender leaves, when applied in the form of a paste, resolve glandular swellings, and the large leaves prove an efficacious remedy for eczema. A decoction of the leaves is used as a gargle in cases of apthæ and stomatitis. The fruit is considered to be cooling, a destroyer of phlegm and impurities of the blood. The wood of the Kadamba tree is of great economic importance, is soft, yellow-coloured, and even-grained, weighing about 40 lb. per cubic foot. It is used for building purposes in Assam, and may be used as material for beams and rafters, being also good for joiner's work. In Calcutta it is one-third as cheap as mango wood. Kadamba trees grow wild throughout India, and are principally used for fuel. The closely allied *Manjal-Kadamba*, the *kolon* of the Sinhalese (*Adina Cordifolia*), and Nir-Kadamba or Chelembe, the Helamba of the Sinhalese (*Stephegyne parvifolia*), are sometimes used by carpenters in Ceylon. The wood of the former is extremely fine and like that of the box tree, being light and durable, though it does not stand damp well; it is used in Bombay for planking for the floors of houses. The former, which is of a light chestnut colour, fine and close-grained, has also been used for flooring-planks, packing boxes, and similar purposes.—*Indian Agriculturist.*

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## BIOLOGY AND ETHICS.

AN exceedingly interesting address, under the above title, was delivered by Sir JAMES CRICHTON-BROWNE at the opening of the Sheffield Medical School this month. In the course of it he showed that biological considerations have thrown some light on certain of the stages of development of those moral sentiments which, in the case of mankind, are modifying the course of natural selection. Rudimentary phases can be traced in the life history of living organisms of a struggle between ethical principles and animal propensities. This struggle has to be fought out in the brain and mind of man, but is foreshadowed in "paltry protoplasmic particles." The moment the investigator gets beyond the solitary cell, mutual obligation or a moral relation is discernible, antagonism being converted into co-operation and conflict giving place to harmony. This co-operation becomes more far-reaching and complicated the higher it is found in the scale of being. "Individualism is gradually subordinated to collectivism, the struggle for existence becomes mainly the concern of the organism as a whole, and is only in a minor degree that of the units of which it is composed. Growth, form, and structure are regulated by an organic process, only very slightly modified by external conditions, and not at all by the selection of the fittest amongst the growing, formative, and tissue-making parts." HUXLEY is quoted as saying of the organs of a plant, that "in each of these complicated structures, as in their smallest constituents, there is an immanent energy which, in harmony with that resident in all the others, incessantly works towards the maintenance of the whole and the efficient performance of the part it has to play in the economy of nature."

In a higher animal millions of cells, differing widely in constitution and habits, not only dwell together in amity, but co-operate for the good of the incorporating system, and undergo harmonious and efficacious metamorphoses as it unfolds. Though the system is still engaged in the struggle for existence, its constituents are not separately so, their self-assertion being limited by the organic process, and an inherent self-restraint on the nutrition and reproduction of each securing the nutrition and reproduction of all. The removal of the restraint by which this equilibrium and comity of the tissues is maintained, results in the overgrowth which is associated with disease, as in the case of cancer. It follows, then, that as in the case of the cell, so it must be with the animal. If two or more animals combine to fight together, a mutual obligation or consensus is at once apparent, for a tacit understanding must exist that they are to refrain from fighting each other whilst the combination lasts. The association useful to animals in the struggle for existence can only be maintained by self-assertion being to some extent held in abeyance. Antagonism becomes merged in co-operation, whilst self-denial modifies the manifestations of individualism. Ants and bees observe an orderly polity which involves the co-operation of different classes, and some subordination of self-will exists in all communities of animals.

Thus, co-operation becomes more conspicuous the higher the position of the organism in the scale of gregariousness and, in the higher races of civilised man, it has to some extent transferred the pressure of the struggle for existence from the individual to the class, whilst tending yet further in the same direction. Of course, social organisation is vastly inferior to that found in living beings, and the differentiation of structure and function in it are nothing like so complete and definite as in the latter, yet the biological process indicates clearly the lines upon which social progress must advance. There is undoubtedly a process slowly developing which will lead to "the harmonious co-existence of different classes, differently employed, and interested in a larger life than their own," whilst also resulting in "the subjection of individual self-assertion to social growth." Individual action can effect but little unless a similar tendency be manifested generally in the class to which the individual belongs. History affords many instances of naturally-favoured individuals, whose excess of zeal in various causes met with no response from those by whom they were surrounded, so that for the time being their labour appeared all in vain. Others again, in no wise superior but more fortunate in having an audience educated up to their own level, have succeeded with but slight hindrance in effecting useful and lasting reforms, that had been vainly contended for by those who had first seen their necessity. So the reproach — that leaders of unquestioned ability, in the early days of modern pharmacy in England, were unable to secure a more general adherence to the principles they advocated—is not likely to be removed until pharmacists as a class become fully imbued with the idea that by co-operation alone they can improve their position as individuals. Whilst many remain aloof, on the selfish plea that they can gain no immediate personal advantage by struggling in the mass, and others stultify their influence by fractious and groundless complaints against those in authority whom they ought faithfully to support, it is next to impossible that any permanent general advantage can be gained, for the healthy and vigorous growth of pharmacy can only be secured by the increased and increasing subjection of individual self-assertion, on the part of all who are interested in its development as a separate art.

### SHEFFIELD SCHOOL OF PHARMACY.

THE ninth session of this school was formally inaugurated on Thursday last, at the rooms of the Sheffield Pharmaceutical and Chemical Society, when the prizes were publicly presented to the successful students of the past session by the President, Mr. G. T. W. NEWSHOLME, member of Council of the Pharmaceutical Society. As is well-known, this school—referred to at the Council meeting last week by the VICE-PRESIDENT as one of the foremost in the country — was promoted and has been consistently supported by the local Society. Between twenty and thirty individual students have attended one or more classes at the school each session since its foundation, and have acquired a sound basis of scientific and technical knowledge upon which a useful super-structure could be, and in most cases has been, profitably built.

The value of the institution, therefore, as a factor in aiding the promotion of systematic education in pharmacy cannot well be over-estimated. In the address to the students delivered by Mr. JOHN HARRISON, J.P., of Sunderland, member of Council of the Pharmaceutical Society (see page 315), this point was referred to, for it was shown that the curriculum of the school affords an arranged system on which the students may base their work, thus preventing the waste of time and energy that is almost bound to result unless work is systematically arranged. The opinions of Dr. LAUDER BRUNTON and Dr. POLLARD, referred to last week (*ante*, p. 290), thus receive confirmation on the part of one well qualified to judge of the value of system in pharmaceutical education, as proved by long experience in the business of pharmacy.

At the conclusion of the opening ceremony the members of the Society and their friends adjourned to the Masonic Hall, where the annual dinner was held. The chair was taken by Mr. NEWSHOLME, who has just been re-elected to the position of president after an interval of eight years, and the success of the meeting was in no degree less than that of former years.

### SCIENCE SCHOLARSHIP.

A scholarship granted by the Cumberland County Council, of the value of fifty pounds per annum, and tenable either at the Durham College of Science or the Victoria University, has been gained by Mr. ROBERT R. HALLAWAY, son of Mr. JOHN HALLAWAY, pharmaceutical chemist and local secretary for Carlisle. Mr. HALLAWAY has decided to attend the courses at the first-named institution.

### BENEVOLENT FUND ELECTION.

WE learn that Mr. ALFRED A. WILLISON, one of the unsuccessful candidates at the last Benevolent Fund election, died on October 4. Mr. WILLISON'S name was included in the list of candidates for the election which takes place next December.

### PROPRIETARY MEDICINES CONTAINING POISON.

SOME points of considerable interest were raised at the Dublin Police Court last month, when the Pharmaceutical Society of Ireland appeared as prosecutor in a case against a grocer named LEONARD, who had sold some KAY'S Compound Essence of Linseed, a preparation alleged to contain poison within the meaning of the Pharmacy Act (Ireland). It was admitted by counsel for the defence that the compound contained poisons, some of which were scheduled under the Act of 1875, but the quantity of morphine alleged to be present was disputed, and the extraordinary assertion was put forward that other ingredients were also present the effect of which would be to render the poisons innocuous. It was further claimed that the preparation was the subject of Letters Patent and, as such, exempt from the operations of the Act. For the prosecution, however, it was urged, first, that the patent had expired and, consequently, the preparation could no longer be regarded as a "patent medicine;" secondly, that even if it were still a "patent medicine," it could only be sold by a registered chemist and druggist; and, finally, that the makers had not followed the specification. The magistrate, Mr. SWIFTE, reserved his decision until Thursday last, when he gave judgment for the defendant. According to the telegraphic report, received as we are going to press, the decision was based on the fact of the preparation "having been a patent medicine."

### THE METRIC SYSTEM IN AMERICA.

WE recently called attention to the fact that, in the new edition of the Pharmacopœia of the United States of America, the metric system of weights and measures had been adopted in its entirety (*ante*, p. 202), and the New Decimal Association now points out that the system is growing in favour generally across the Atlantic. Thus, the Board of Managers of Engineering Societies, at a meeting lately held in Chicago, has resolved that illustrations to be drawn to scale should bear the metric scales, and certain denominations, such as the kilometre, are said to be in common use in the daily press.

# Transactions of the Pharmaceutical Society.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 11th inst., the Librarian and Curator presented the following reports of donations to the Society's Library:—

*To the Library in London.*

**University of Edinburgh**:
Calendar, 1893.
**University of Glasgow**:
Calendar, 1893.
**King's College, London**:
Calendar, 1893.
**Mason College, Birmingham**:
Calendar, 1893.
**Yorkshire College, Leeds**:
Calendar, 1893.
**University College, Bristol**:
Calendar, 1893.
**School of Medicine, Edinburgh**:
Official Calendar, 1893.
**Mrs. Samuel Gale, per Mr. Walter Hills**:
Sundry volumes of the Pharmaceutical Journal, Gmelin's Chemistry, etc.
**Mr. F. M. Bailey, Colonial Botanist, Queensland**:
Companion for the Queensland student of plant life, 1893.
**Mr. C. A. Barber, St. John's, Antigua**:
Supplement to the Leeward Islands Gazette, sundry numbers.
**Messrs. Warden and Hooper**:
Pharmacographia Indica, index and appendix.
**Professor J. Moeller, Graz**:
Pharmakognostischer Atlas, 1892.
**Mr. E. L. N. St. Cyr, London**:
Cicero's Laelius on Friendship, 1880.
Guide to examinations by the Conjoint Board, 1889.
Sallust, 1881.
Blaikie's Elements of Dynamics, 1887.
South Kensington Mathematics, 1890.
**H. M. Secretary of State for India**:
Flora of British India, part 19.
**Sir Dietrich Brandis, Bonn**:
Combretaceæ, 1893.
**Institution of Civil Engineers, London**:
Charter, etc., 1893.
**Institute of Chemistry, London**:
Regulations and Register, 1893.
**Ecole supérieure de pharmacie de Paris**:
Thèses par MM. Causse, Gascard, Meslans.
**Herr E. Dieterich, Helfenberg**:
Helfenberger Annalen, 1892.
**Mr. G. C. Druce, Oxford**:
Botanical Exchange Club, Report for 1892.
**Professor E. Schaer, Strassburg**:
Schweizerischer Apotheker-Verein, Festschrift, 1893
**Professor P. C. Plugge, Groningen**:
Ueber die toxische Wirkung von Hypaphorin, etc.
Untersuchung einiger niederländisch-ostindischen Pflanzenstoffe.
**Professor Attfield London**:
Chemistry, 15th ed., 1893.
**Mr. William Moore, Felstead, Essex**:
Volume of botanical plates.
**Professor Treub, Buitenzorg Gardens, Java**:
Monografia de plantis venenatis et sopientibus quae ad pisces capiendos adhiberi solent, a M. Greshoff, 1893.

## EXAMINATIONS IN LONDON.

*October*, 1893.

(*Continued from page* 297.)

Dr. Stevenson attended on behalf of the Privy Council.

### MINOR EXAMINATION.

*One hundred and fifty-nine* candidates were examined. *One hundred and eight* failed. The undermentioned *fifty-one* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Anderson, George William | Thirsk. |
| Baker, Frank | Towcester. |
| Barker, Arthur Brook | Mirfield. |
| Budworth, James Phineas | Derby. |
| Cox, Harry Bertrand | Shepton Mallet. |
| Cross, Herbert Francis | Cambridge. |
| Davies, David John | Swansea. |
| Davies, John | St. Clears. |
| Davies, Robert Fisher | Pontardawe. |
| Dennis, Ernest Edwin Gascoigne | Louth. |
| Dukes, Edward Thomas | Penkridge. |
| Dunford, Oswald Frederick | Llynclys. |
| Dunn, Henry Benjamin | Gainsborough. |
| Dyson, Herbert | Derby. |
| Elliott, Oliver Thomas | Leicester. |
| Gibson, Robert Roxburgh | Newcastle-on-Tyne. |
| Goff, Thomas Summers | Handsworth. |
| Harris, John Flinton | Bournemouth. |
| Howells, Gwilym Harries | Brecon. |
| Hughson, Alexander Sinclair | Bath. |
| Johnson, Harrison Percy | Prestwich. |
| Johnson, Walter | Birmingham. |
| Jones, John Monk | Aspull. |
| Jones, Thomas | Llandyssul. |
| Kellett, Thomas Henry | Bishop Auckland. |
| Lake, John William | Exeter. |
| McFadden, Wilfred Edgar Walter | Southsea. |
| Newton, Augustus | London. |
| Owen, Evan Thomas | Conwil. |
| Peat, Samuel | Mansfield Woodhouse. |
| Phillips, Francis Daniel | Haverfordwest. |
| Pole, Miles Walker | Edinburgh. |
| Price, Charles Hedley | Leominster. |
| Pritchett, William Edward | Chichester. |
| Read, Thomas | Bristol. |
| Roberts, Walter John | Bath. |
| Sadler, Frank William | Ipswich. |
| Sarson, Arthur John | Leicester. |
| Sherwood, Joseph Henry | Withington. |
| Simpson, Arthur | Huntingdon. |
| Smith, John Thomas | Gateshead. |
| Smith, Richard Theodore | Ruabon. |
| Spencer, Frederic | Uttoxeter. |
| Tarry, William Ambrose | Derby. |
| Thorpe, Albert | Boston. |
| Townsend, Percy | Riding Mill. |
| Watkins, David | Pentyrch. |
| Wells, William Luty | Louth. |
| Wheeler, Henry William | London. |
| Wicks, Harry Gilbert | Keswick. |
| Wildman, Harry George | Feltham. |

### MODIFIED EXAMINATION.

*One* candidate was examined, and was declared qualified to be registered as a Chemist and Druggist:—

| | |
|---|---|
| Bedells, Arthur | London. |

### FIRST EXAMINATION.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Anthony, Everard Percival | Bedford. |
| Clark, Joseph Branch | Edinburgh. |
| Collitt, William Silvester | Northallerton. |

| | |
|---|---|
| Comley, James | Barrow-in-Furness. |
| Dutton, Hugh Reginald | Rickmansworth. |
| Estlick, Samuel H. | Truro. |
| Gillitt, Albert Ambrose | London. |
| Hender, James | Stamford. |
| Hughes, Job | London. |
| Hughes, Joshua Arthur | Abercarn. |
| Hughes, William Richard | Colwyn Bay. |
| Lewis, Harold | Hull. |
| Mercer, Frank Norland | Farnworth. |
| Price, Arthur Henry | Brighton. |
| Rawling, Joshua | Cockermouth. |
| Reynolds, Richard W. H. | Bolton. |
| Woollatt, Percy Charles | Ware. |

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## FIRST EXAMINATION QUESTIONS.

*October* 10, 1893.

### LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*)

I. (*For all Candidates.*) *Translate into Latin:—*

1. We praise the work of one man.
2. The voices of the judges will be heard by the boys.
3. The one built the wall, the other the city.
4. No one doubts that he will come.
5. Having conquered the enemy, Caesar returned on the first day of the year.

II. Translate into English either A (Caesar) or B (Virgil).

(*Candidates must not attempt both authors.*)

#### A. CAESAR.

1. His responsis ad Caesarem relatis iterum ad eum Caesar legatos cum his mandatis mittit: Quoniam tanto suo populique Romani beneficio affectus, cum in consulatu suo rex atque amicus a senatu appellatus esset, hanc sibi populoque Romano gratiam referret, ut in colloquium venire invitatus gravaretur neque de communi re dicendum sibi et cognoscendum putaret, haec esse, quae ab eo postularet: primum ne quam multitudinem hominum amplius trans Rhenum in Galliam traduceret.

2. Posteaquam in volgus militum elatum est, qua arrogantia in colloquio Ariovistus usus omni Gallia Romanis interdixisset, impetumque in nostros ejus equites fecissent, eaque res colloqium ut diremisset, multo major alacritas studiumque pugnandi majus exercitui injectum est.

*Grammatical Questions.*—For those only who take Caesar.

1. Give the genitive singular and the gender of all Nouns in Paragraph 2.
2. Account for the moods of the following verbs, and give the principal parts of each:—*mittit*, *referret*, *venire*, *putaret*, *traduceret* (Paragraph 1).
3. Decline in full the Relative and Interrogative Pronouns in Latin.
4. Write out a complete list of Prepositions found in Paragraph 1, and show what cases they govern. Account for the difference between *in consulatu* and *in Galliam* (Paragraph 1).

#### B. VIRGIL.

1. Vix e conspectu Siculae telluris in altum
Vela dabant laeti et spumas salis aere ruebant,
Cum Juno aeternum servans sub pectore volnus
Haec secum: "Mene incepto desistere victam,
Nec posse Italia Teucrorum avertere regem?
Quippe vetor fatis. Pallasne exurere classem
Argivom atque ipsos potuit submergere ponto
Unius ob noxam et furias Ajacis Oïli?"

2. Quis te, nate dea, per tanta pericula casus
Insequitur? quae vis immanibus applicat oris?
Tune ille Aeneas, quem Dardanio Anchisae
Alma Venus Phrygii genuit Simoentis ad undam?
Atque equidem Teucrum memini Sidona venire
Finibus expulsum patriis, nova regna petentem
Auxilio Beli; genitor tum Belus opimam
Vastabat Cyprum et victor dicione tenebat.

*Grammatical Questions.*—For those only who take Virgil.

1. Give the genitive singular and the gender of all Nouns in Passage 2.
2. Give the principal parts of all the Verbs in Passage 2.
3. Decline in full the Relative and Interrogative Pronouns in Latin.
4. Write out a complete list of Prepositions found in Passage 1, and show what cases they govern.

### ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*)

[The working of these questions, as well as the answers, must be written out in full.]

1. How many square yards of glass will be required to glaze 3 windows each having 4 panes, each pane measuring 2 ft. by 1 ft. 3 in., and 5 windows each having 4 panes, each pane measuring 2 ft. 3 in. by 1 ft. 6 in.?
2. Find the difference between $3\frac{1}{17}$ of 2 qr. 25 lb., and ·25 of 4 cwt. 2 qr. 20 lb.
3. Find the value of $\cdot 2\dot{5}\dot{9}$ of 16*s.* 10*d.* + $\cdot 031\dot{2}$ of £12 10*s.*
4. If a bankrupt, whose whole possessions amount only to £625 13*s.*, pays a dividend of 1*s.* $3\frac{1}{4}$*d.* in the pound, what does he owe?
5. Write out the Metric Table of Capacity; and give approximately the equivalent in English measure of 3 décalitres.
6. If 5 men and 7 boys can reap a field of corn of 125 acres in 15 days, in how many days will 10 men and 3 boys reap a field of 75 acres, each boy's work being half that of a man?
7. The price of Consols being $88\frac{3}{8}$, how many railway shares, the market price of which is £8 15*s.*, can be purchased for £1000 Consols?

### ENGLISH.

(*Time allowed—from* 3 *p.m. to* 4.30 *p.m.*)

1. Analyse:—

"The stag at eve had drunk his fill
Where danced the moon on Monan's rill,
And deep his midnight lair had made
In lone Glenartney's hazel shade."

2. Parse fully:—*Methinks nobody should be sad but I.*
3. Give words formed by the following suffixes (one from each), and explain the force of each suffix:—*age*, *ish*, *less*, *en*, *some*, *hood*.
4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—madame knows best said ivan who sat opposite to her quietly rolling cigarettes and smoking them as if to do so was his one chief duty in life we know madames history said paul why repeat it in our presence have our friends asked anna turning to ferrari and then glancing at the three persons unnamed been made acquainted with our victory at venice

*5. Write a short composition on *one* of the following subjects:—

(i.) Strikes.
(ii.) The instincts of birds.
(iii.) The House of Lords.
(iv.) "Thrice is he armed that hath his quarrel just."

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* This must be attempted by every candidate.

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

**The first meeting for the session 1893–4 was held at 103, Great Russell Street, on Thursday, October 5, the President, Mr. E. F. Harrison, in the chair. After the usual preliminary business and the nomination of new members, the President read the following**

### Inaugural Address.

Gentlemen,—In addressing you from this chair, to which you have done me the honour of electing me, at the commencement of our seventeenth session, it will perhaps not be out of place to offer a few remarks on the position occupied by this Association.

Sixteen years ago, some London assistants united themselves together for purposes of mutual improvement and enjoyment, and so created the Chemists' Assistants' Association, which since that time has continued, with varying vicissitudes of fortune, to exist. The objects for which it was formed, which are referred to in the rules, are to promote social and friendly feelings among chemists' assistants, and to provide opportunities for reading and discussing papers on matters of interest to them.

I think we may admit that on the whole the Association has succeeded fairly well in accomplishing those objects; very many assistants have spent pleasant evenings here; have made friendships that have been deep and lasting, and many pleasant acquaintances that have been passing; have learnt to view others engaged in the same work as themselves as colleagues, and have been drawn out of the semi-frozen condition that chemists' assistants get into when they are out of reach of such a society as this. Many, too, have been the papers that have been read and published, and much useful work has first seen the light through this agency. There have been papers on almost every subject related to pharmacy, and on many subjects not related to it. On all these papers there has been discussion, which has brought out many points not in the papers, and has had the highly beneficial result of giving men practice in discussing, in thinking rapidly on a subject, and rapidly throwing those thoughts into words. But while giving the Association credit for all the good work it has done, we must also admit that it has not succeeded as some of us would like to see it succeed. For instance, with all the hundreds of assistants there are in London, our membership has not risen above two hundred. Of course, London is a big enough place for not one, but a dozen such associations, and we can hardly expect men from the more distant parts of the town to come here regularly to our meetings. Still, many think it worth while to belong to the Association even when they are not able to come here often, and we might legitimately expect that in this metropolis an association formed with the objects I have referred to should have a very much larger membership than we have ever had. I propose to-night to shortly urge the claims of the Association on assistants, at the risk of appearing to do so unduly.

I do not suppose many will take exception to the objects of the Association, viz., the promotion of social intercourse, and the reading and discussing of papers, but I should like every assistant to make up his mind decisively whether these objects are good, bad, or indifferent, and if they are good, whether something is not required of him individually towards their fulfilment. I will deal with the social side first.

It is felt and admitted on all hands, by both proprietors and assistants, that somehow the business of pharmacy is in a bad way. The old easy-going and easy-paying business is no more; the type of druggist who lived by it is dying out, and is being replaced by the scientific and up-to-date pharmacist on the one hand, and by the pushing, cutting, unscientific but business-like storekeeper on the other. Prices are quite disorganised, there is no uniformity of practice in anything, and members of the trade are constantly crying out for some drastic and impracticable remedy or other, but disagree widely about what that remedy should be. It would be outside my present scope to attempt to exhaustively consider the causes of this unsatisfactory state of things; but it is probably within the experience of all here that many, very many of the ills from which pharmacists suffer arise directly and entirely from mean and petty trade jealousy and rivalry. For instance, one man complains loudly of the long hours he has to slave in his shop, and will not close any earlier because his rival round the corner will not. Another grumbles at the bad prices he gets, and sells patents at a halfpenny less than the man over the way. Yet another protests against doctors dispensing, and perhaps using inferior galenicals, and supplies the nearest open surgery with tinct. rhei *sine* croco, because if he did not somebody else would, and so on. Your own memories will supply you with abundant illustrations of this sort of thing. No doubt there is trade jealousy and bitter rivalry in plenty of other businesses, but one would expect that chemists, whose trade approximates to a profession, would be fairly free from it. But the contrary seems to be the case; there is more rather than less of this paltry feeling among chemists than among other tradesmen, and I repeat, gentlemen, that this matter is at the root of very many of the evils of which pharmacists are never tired of grumbling.

Further, with regard to the unfortunate aspects of the trade which cannot be directly ascribed to this sort of thing, which we lay at the door of an inappreciative public that loves cheapness above all things, or of doctors who dispense their own medicines, and a dozen other causes; these difficulties could surely be met far better if pharmacists would take counsel together about them and act in union. But they do not; pharmacists are a disunited set of men, and it is greatly to their own loss that they are so. There is, I think, and most people think, nothing which the druggists of this country need so much as the faculty of pulling together, and they must get that if their grievances are to be redressed; and, in proportion as they become more united, so will they find things will mend.

You will feel tempted to remind me, gentlemen, that I am addressing an assistants' association, and not a gathering of proprietors. But, just as with habitual drunkards and criminals generally the reformer frequently finds that all he can do is to try and keep them out of harm's way and mitigate the evil effects of their doings, and for really good results he turns to the children, and says "Our hope must be in these; we will keep them from following in the footsteps of their parents," so I must say, the hope for pharmacy is in the rising generation. The assistants of to-day are the proprietors of to-morrow, and if they have been on terms of good friendship as assistants, and have learnt to regard each other as comrades, there is good reason to hope that the habits of association and of acting in union which they have so acquired will not leave them as soon as they pass out of assistantship, but that they will retain them, and will feel themselves and other chemists and druggists to be all members of the same body and bound together in the same interests. We may hope that even when two of them go into business in the same neighbourhood they will remain friends, and will pull together for their mutual advantage, instead of trying to cut each other's throats as an exhibition of neighbourly feeling. Therefore I say, gentlemen, if you want a better outlook in pharmacy than there seems to be at present, learn now to make friends with your colleagues, and as far as may be sink your individual selves with your private interests in the interests of the body to which you belong. To those London assistants who are not members of this Association I would say, become so, not merely because it is to your own advantage, but because it is to the advantage of the whole body of assistants that they should be as solidly united as possible. To those who are members I say, get your friends to join. If you think association worth anything, do not be content with seeing it practised on such a small scale; enlarge the scope of our action, let us be united on a larger scale. Probably every member of this Association knows several assistants who are not members, and if he would persuade them to join, our numbers might soon be trebled or quadrupled.

Before leaving the subject of unity among assistants, there is one other point I must refer to. We are not merely an association of assistants; we have forty employers in connection with us as patrons. I mention this particularly, because it is no less important for assistants to be on a friendly footing with employers than with other assistants, and one excellent way of promoting this good feeling is that both should be in connection with the same association.

Passing on now to the second named of our objects, the reading and discussion of papers on matters of interest to us, this seems to be very well correlated with the second great need of pharmacists to-day, viz., the need of better education. The ill-educated pharmacist, the man who is out of touch with all recent improvements in the art of his business, who is incompetent to undertake any work which lies at all outside his most ordinary routine, such a man is to-day an anachronism. You only need to look round to see that it is the well-trained and well-educated men who succeed in the drug trade now, and it requires no great perspicacity to perceive the connection between the large number of unscientific and untrained men in the trade and the large number who can scarcely make a living at it, and are disgusted with it.

The rising generation bids fair to be a long way in advance of the present in the matter of scientific knowledge, thanks largely to extended examinations; but it would be very erroneous to suppose that when a man has attended a course of study and passed the Minor and Major, he is therefore an educated man for the rest of his days, and is fit to take any post in pharmacy that is open. The work for the examinations is not sufficient to last him for ever, and he must go forward, or he will slip backward; he must keep abreast of current work, and if possible take a share in it, or he will soon be out of date. To avoid this, and to help to real progress, one of the best plans is to attend meetings where papers on all things connected with up-to-date pharmacy are read and discussed, and to take part in the discussions, and occasionally contribute a paper. This is what is provided at our ordinary meetings, and I think without some such object the value of the social side of the Association would be much less than it is. For proof of the fact that the work brought forward here is of a really useful nature, I need only refer the sceptical to the back volumes of our proceedings, where are to be found papers of use and interest to assistants of all grades.

But we do not only deal with matters of pharmaceutical interest, as distinct from trade matters. There is a distinct need of some apparatus for educating the rising pharmacist in the various aspects of different trade questions; and here we have the opportunity of exchanging views on all these subjects, and so helping to develop our own and each other's ideas. Educated and sensible men, as many assistants now are, will naturally take intelligent views of matters which directly affect their business interests; and they will improve their own ideas and their respect for each other by discussion of all such matters in a reasonable way. This Association occupies a quite independent position, and is under the wing of no one and no other society, and we shall always welcome an expression of views, so long as they are rational, from anyone on a trade matter. In these two ways, then, the Association has an important educational function.

Perhaps some non-members will say, "It is all very well to try to persuade us to join the Association and to talk in this strain about it, but we are not so well pleased with it as all that, and we do not see the good of joining." To all such I reply, if you do not like the Association as it is, come into it and mend it. It is a democratic institution, and is worked by a majority vote; if anyone does not like what is done let him persuade the majority that better can be done, the field is open for it to be done by him or anyone else. If, instead, the majority persuade him that he is in the wrong, all the better; in either case, it is surely wiser to take part in what is being done, and try to improve the doing of it, than to keep your ideas to yourself and do nothing but talk against what you will not take the trouble to try and alter.

I must insist, again, on the fact of this being a democratic Association, for the sake of another point. This, namely, that whatever attitude is taken up by the Association on a given matter, or whatever policy we pursue, it is ultimately the rank and file of the Association who are doing it. The officers of the Association are its mouthpiece, they are willing and anxious to serve it with their time and energy and experience; but they must ultimately act only for the Association. If we are to see better days arising for pharmacy from greater union among assistants, it is you who must move in the matter. You cannot put your responsibility off by electing others to the Council, you must do your part, and anything which is done by the executive must be done as an expression of your feeling and your will.

It is my belief that if the numerical strength of this Association can be increased so that we represent a far greater number of assistants; if we can feel, as I think we now can, that the majority of the best trained and most efficient assistants in the trade are among our members, and if the rank and file of the members will take an active interest in the affairs and conduct of the Association, we shall then carry the weight that the London Chemists' Assistants' Association ought to carry, and occupy the responsible and important position which is our due.

Gentlemen, I hope you will not think I have given you the subject of union *ad nauseam*, but to my mind it is the most important matter for an association like ours. Now, before concluding my remarks, I should like to just refer to our half-sessional programme. You have all, I do not doubt, received a copy of it, and I hope it is satisfactory to you. The musical evenings I need say nothing about, as I am sure they will be as well attended as usual. With regard to the papers, the scientific ones are of a directly practical nature, and will, I think, be very useful to all of us; while I hope on the evening devoted to short papers we shall have some good practical notes from our members. Towards the end of the half-session we have two evenings devoted to the discussion of matters of much interest; the pharmacist as a man of science, and pharmaceutical training. These are both subjects of importance to those who are constantly recruiting the ranks of full-fledged pharmacists, and I hope there will be particularly good attendance and discussion on those evenings. I would say the same with regard to the discussion next month on how to check unjust trade, which should have some good working result. Our earliest paper is on a more recreative subject, "A Pharmacist's Holiday," by a past president, whose name is a sufficient guarantee that it will be very interesting. In short, gentlemen, I congratulate the secretaries on what they have provided for us up to Christmas, and I appeal to you all to do everything in your power to make this a successful session. I have only further to thank you for your kind attention to what I have said.

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Mr. Ince, in proposing a vote of thanks to the President for his able address, congratulated the Association upon having for a president a gentleman with such an experience of practical work, and went on to say that the work of chemists' assistants was both practical and theoretical, but because they were practical men they must not despise theory, as that was the sum and substance of records of other men's practical work. Mr. Ince further commented upon a practical portion of the programme for the session, *viz.*, the social evenings, and thought that many advantages were to be reaped from social intercourse between assistants, and that much of the petty jealousy which existed in the trade would cease to exist if friendships were cultivated amongst assistants.

Mr. Frank A. Rogers, in seconding the vote of thanks, said he felt the Association was under very good guidance for the coming session, but he would like to bring forward his old idea of individualism, for the success of the session, he was sure, depended not only upon the work done by the executive, but also upon that done by each individual member.

The President, in replying to the vote of thanks, which was carried with acclamation, made reference to the altered regulations under which the Association prizes were offered, the two awards now being for, 1st, "Original Work done by a Member;" 2nd, "A Paper on some Subject of Pharmaceutical Interest."

The meeting then terminated, and the members adjourned for refreshments.

# Provincial Transactions.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The inaugural meeting of the ninth session of the School of Pharmacy in connection with this Society was held on Thursday last, when the prizes were presented to the successful students of the past session, after which the following address was delivered:—

### INAUGURAL SESSIONAL ADDRESS.

BY COUNCILLOR HARRISON, J.P., OF SUNDERLAND.

It is to me a source of great satisfaction and pleasure to meet the members and associates of the Sheffield Pharmaceutical and Chemical Society on the occasion of the opening of the ninth session of their operations. And I am glad to know that, having as a society enjoyed so far a highly successful and satisfactory experience, you are enabled to enter upon the session full of hope and confidence that the good work begun may be continued, that the high reputation this school has attained may be maintained and increased, and that from it may proceed many students whose future career will bear eloquent testimony to the soundness of the instruction here imparted, a career which shall redound to the credit of your school, to the honour of the student, and to the advantage of society.

I assume that every student here has already passed the Preliminary examination, which is intended to test his "knowledge of the Latin language, in English grammar and composition, and arithmetic," for no youth should enter on the study and practice of pharmacy who has not received such a scholastic education as shall have produced in him habits of observation and thought to prepare him for a calling in which these qualifications must be brought into continual exercise.

But although I experience an undoubted sense of pleasure in addressing you, I am, at the same time, fully conscious of the responsible character of my task, for whilst, on the one hand, I must be careful not to underestimate the difficulties you have before you, neither, on the other hand, do I wish to discourage you by overstating them. You are certainly entering on a path which will lead to a wide field for the active employment of your mental faculties, and I hope that I am not wrong in assuming that with every one of you this is an attraction rather than otherwise, and that you desire an occupation which will afford such opportunity. Persistent, patient, painstaking study will equip you to deal with all the difficulties you will meet, of which there are none which the careful employment of the powers God has endowed you with, and the intelligent use of the advantages the curriculum of this school affords, you cannot master and overcome. Be not afraid of difficulties, but be prepared to manfully meet them and overcome them. The exertion necessary for this is valuable to you. Hear what the immortal Burke says on this matter, "Difficulty is a severe instructor, set over us by the supreme ordinance of a parental guardian, who knows us better than we know ourselves, as he loves us better too. He that wrestles with us strengthens our nerves and sharpens our skill. Our antagonist is our helper. This conflict with difficulty obliges us to an intimate acquaintance with our object and compels us to consider it in all its relations. It will not suffer us to be superficial." These eloquent words I commend to every student, to be remembered by him in times when difficulties seem to press hard upon him, that he may be stimulated and strengthened to make the effort required for victory. I purposely just now used the words curriculum of your school, and for this reason. It affords you an arranged system on which to base your work, and prevents the waste of time and energy which will necessarily result unless your work is thus arranged. But this arrangement will require that you, on your part, shall give a punctual and regular attendance at the classes, and that your home work shall be conducted on the lines there laid down, and thus fill up and complete the scheme of instruction arranged for you. But not only must your attendance be punctual and regular, but the attention to your work must be earnest and sustained, so that you may not only develop the capacity to master the principles of the sciences on which your profession is founded, but also the capability of applying them to the operations which your daily work will demand of you. The usefulness and the success of your future career will very largely depend on the character of the foundation now prepared, and I urge you to use all diligence that such foundation shall be sound, substantial, and secure, so that when the time arrives for you to assume the full responsibility of your calling you may be found fully qualified for the position, and equal to the demands your work will make upon you.

What is that work?

Broadly speaking, the preparation of medicine for the relief or cure of disease. It is not the practice of medicine, but the preparation of medicine. It is not yours to diagnose disease, but to dispense the remedy required for its relief or removal. Yours is the practice of pharmacy, and is the handmaid to the practice of medicine. I am aware, of course, that the functions of the two do occasionally overlap, and that it is not always easy to determine where the one begins and the other ends. The relative position of medical men and chemists ought to be one of mutual assistance in the discharge of their professional duties, the one giving his attention to the diagnosis of disease and the prescription of the proper remedies for its successful treatment, and the other devoting himself to the preparation of such remedy and its presentation in its purest, most convenient and effective form. Such a division of operation would be to the advantage of all concerned, the physician, the pharmacist, and the patient. It is obviously of the highest importance to the success of medical treatment that the quality of the drugs employed is such as can be thoroughly relied upon. The physician may have in his mind a remedy which, if in a pure state, has a clearly defined potency on which he relies to effect certain results. But if the quality of the drug be inferior, then it is quite clear the intended effect will not be produced, with the result that disappointment is caused to the prescriber, and distress, and possibly disaster to the patient. This is most effectively guarded against when the prescription of the remedy is in the hands of one who has made the treatment of disease his study, and its preparation entrusted to another whose qualifications prove his ability for the work. Our relation to the physician is very much the same as that of an amanuensis to an author. The duty of an amanuensis is to write at the dictation of the author the words as he requires them to appear in the work on which he is engaged, and to make no deviation therefrom either by addition, substitution, or suppression. Think of the enormous loss the poetry of this country might have sustained if the words of the glorious Milton had, after their dictation, been thus tampered with. How much of the magestic power of his classic mind would have been lost, and how distinctly poorer to-day would have been the poetic literature of our language. And this, to my mind, represents our position towards the physician, and it is our duty, and it should be our highest endeavour to interpret correctly and carry out faithfully his instructions.

These two branches of the healing art are to a great extent, and ought to be to a much greater extent, dependent one on the other, and the history of the development and progress of the one is very largely also a history of the development and progress of the other. Immediately sickness and suffering appeared in the world, the natural law of self-preservation induced men to seek for remedies for their relief, and there consequently soon sprang into existence a body of men who professed an ability to treat and cure disease. Sickness and suffering were mysterious experiences, and could only be removed by mysterious agencies. Their origin was involved in mystery, their treatment must be conducted in mystery also. The cause of disease was neither known nor sought for, but was usually attributed to some unknown dispensation. All bodily phenomena were regarded as the effects of supernatural causes, external agencies, and hidden and mysterious influences. At one time the care of the different parts of the body was supposed to rest with some demoniacal spirit, whose anger and displeasure caused disease, which could only be dispelled by means of offerings and sacrifices. At the Christian era this old Egyptian superstition was supplanted by another superstition, which assigned the care of the several parts of the body to their guardian angel; Milton, referring to this, observes that the saints usurped the place of the heavenly constellations in their dominion over the various parts of the human body, so that "For every limb they have a saint." This alteration indicated the changed order of things as regarded religious matters, for in the former case an unfeeling demon for his own pleasure and gratification was supposed to inflict the suffering, whilst in the other the misconduct of the sufferer withdrew from him the protection of the offended saint, and hence his sad condition. Here we perceive that although a gross superstition still prevailed, there was some advance being made, and we find, as it were, the first rays of that greater light which would ultimately reveal that disease is not necessarily a part of man's experience, but is in very many instances due to causes that are preventible. I must not weary you, nor is it necessary for my purpose, with an account of the progress of the science of medicine during the long ages. Its history is the history of the decline of superstition. It is a record of patient and systematic investigation into the conditions under which disease is found and flourishes with a view to the determination of the causes thereof. And at no period has this important work been more vigorously prosecuted than during the time our beloved Queen has occupied, with such grace and acceptability, the imperial throne. It was in the first year of Her Majesty's reign that the registration of the births, deaths, and marriages was effected. The information thus obtained has promoted and assisted the systematic investigation of questions concerning the public health, has brought into greater prominence sanitary science, and has caused public attention to be directed thereto, with the result that since that time legislative action has again and again been taken with the object of effecting an improvement of the conditions under which many of the people in our large towns and elsewhere have been compelled to exist.

It is fully recognised that in this matter prevention is better than cure, that time and money expended in the prevention of disease is the best policy, both for the individual and the community.

So now to maintain a high standard of sanitation we do not propitiate a demon, but we provide a good drain; we do not sacrifice to a saint, but we construct a sufficient sewer; we do not endeavour by means of the charm of a fairy to destroy the curse of a fiend, but we strive to find the cause of disease with the view to effect its removal, and we endeavour to make provision that people may live in healthy houses and have fresh air, pure water, and unadulterated food. I have mentioned these things to you because I desire to impress upon you the fact that the great advance made in the practice of medicine indicates and marks a similar advance in its preparation and administration, and that such advance demands and will demand of those engaged in it a higher education and a more careful and scientific training than formerly were necessary. I have previously assumed that you have given practical proof of the former condition by presenting yourselves for, and your successful passage through, the examination designed for that purpose, and your presence here to-day indicates your intention, and I hope also your determination, to undertake the latter.

With this object the careful study of the principles of two most interesting sciences must occupy your attention, namely, botany and chemistry. And I do not use these terms in any limited or qualified sense, for I no more recognise the propriety of the expression pharmaceutical botany or pharmaceutical chemistry than I do pharmaceutical Latin or pharmaceutical mathematics. These sciences will supply you with the keys by which the principles and the practices of the more purely technological part of your training will be opened to you, and it is all important to you, therefore, that you should carefully and thoroughly master the principles on which they are founded.

Botany is the branch of natural history which has reference to the external or physical characters, and the internal structure of plants, their vital actions and their classification. The pursuit of this science is intensely interesting and attractive, as it unfolds all the great wonders of the vegetable creation, and is well worthy of your enthusiastic attention for its own sake. It brings you into contact with the beautiful in every variety of form. colour and smell. You may remember how in the old times a little band of followers were directed to "consider the lilies of the field," to find there a beauty excelling all the splendour of an oriental court at the time of its greatest magnificence. And mark, the direction was to consider, and that direction applies to you, for, if you desire to find the full beauty, and the instruction which the study of the flora and plants of our country affords, you must not only look at but carefully consider the specimens gathered in your rambles about the fields, on the hill sides, and in the country lanes of our land. Botany will in this way provide you with an agreeable occupation in your leisure time, as well as prove a valuable help to you in your business.

Chemistry also opens a wide and marvellous field of investigation to the inquiring mind. It is the science which treats of matter in respect to its nature, its composition, and its properties. It investigates the mutual relations between different masses of matter and their action on each other when under the influence of chemical force. The magnitude of the field of its operations, the unerring precision of its laws, and their marvellous adaptation to the wants and comfort of mankind soon fill the thoughtful student with astonishment and admiration. The history of this science through the present century has been one of remarkable progress, and its influence on the industrial arts, on agriculture and on medicine has contributed more largely probably than any other branch of science to the health and wealth of the community.

Bring together a good store of the facts and principles on which these two sciences are based, and they will prove of inestimable value to you, for they will not only render your progress in the study of the sciences more immediately connected with your craft, namely, materia medica and pharmacy, more satisfactory, but will also produce in you such a habit of accurate thought and careful observation that will be highly advantageous to you, in matters other than the technical ones, in which you are specially interested. It may perhaps occur to some of you that much is demanded of you. It is so. You have by law been entrusted with grave and responsible duties, and there is the obligation resting on you that you should be fully qualified for their satisfactory and adequate discharge.

And, moreover, you must be careful not to misunderstand the signs of the times. For a quarter of a century we have had a compulsory system of elementary education in operation, by which the standard of education amongst the people has been materially raised, and we have now to meet a strong and widespread demand for technical instruction, the better to enable us to meet the strong foreign competition our trade is subject to; and, further, the general public for some years have become more and more familiar with scientific subjects through the greater practice of photography, chemistry and electricity, and they look to the chemist, and they properly look to him, for guidance in the difficulties that from time to time beset them, and it will be to his distinct advantage to see that he is qualified to give the required assistance.

Make, then, and continue in the future to make, every exertion to increase your stock of knowledge, to cultivate your science and improve your art, and be thus able to depend on your own ability for success in life, and not on legislative protection. The law must and will protect you in some things, and I do not hesitate to affirm that it ought to protect you in much more than it does, but there is much in a man well equipped for his profession which no law can give, and which no law can take away.

"How small, of all the ills mankind endure,
That part which laws or kings can cause or cure."

A well-educated chemist and druggist thoroughly acquainted and conversant with his profession will not fail to win the confidence of the thoughtful public. He will also convince the careful observer that he is something more than a tradesman, and that pharmacy is not only an art but a science.

Your training will be directed mainly to fit you for the responsible and delicate duties of the ordinary practice of pharmacy, but there is no reason, if you devote yourselves with diligence to your studies and make the best use of the opportunities afforded you, that you should not add to it other and equally responsible work. Legislation, which in former times was mainly concerned in the protection of what were called the rights of property, in these happier days is directed more to the promotion of the welfare of the people, and in nothing is this more clearly evident than in the measures taken for the preservation of the public health: "Salus populi lex est suprema," and we now consequently find in every part of the country officers charged with this all important work, and I see no reason why the few members of our craft who have already attained high position in this branch of the public service should not be the first fruits of a rich harvest of similar appointments in the future. Whether this will be so or no rests largely with those who, like yourselves, are now entering the ranks of pharmacy.

My friends, place before yourselves and persevere in working up to a high ideal. Your calling is one which presents great possibilities, and although it may not be given to everyone to secure them, it is the duty of all to strive for them. Remember at all times the responsible character of the duties you are called upon to undertake, and make their intelligent and faithful performance your chief concern. You owe this to the Legislature which has endowed you, although scantily, with some special privileges, to the Association with which you are connected, and you owe it to yourselves. For you have inherited the stores of learning of all the previous ages, you have the advantage of the mighty discoveries of this, the most marvellous, century the world has yet known, you enjoy means of instruction in your midst which a former generation knew not, and it is of you, to whom much has been given, that much also will be required.

# American Pharmaceutical Association.

## The Preparation of the Oak Tannins, with special reference to the use of Acetone as a Solvent.

BY HENRY TRIMBLE AND JOSIAH C. PEACOCK.

The usual method for preparing a tannin from a substance as rich as nutgalls, or containing from 60 to 70 per cent. of the astringent principle, is to extract with a mixture of alcohol and ether, or, what amounts to the same thing, official ether sp. gr. 0·750. When, however, the material is an oak bark, containing from 4 to 15 per cent. of tannin, the choice of a proper solvent becomes a more difficult matter.

During the past year a number of experiments have been made on oak bark with a view of determining the most satisfactory solvent for the tannin. The following are especially worthy of consideration:—

(1) Official ether sp. gr. 0·750, which is equivalent to a mixture of alcohol and ether.

(2) Acetic ether.
(3) Water.
(4) Acetone.

The greatest objections to ether are its expense and the slowness of its solvent action, which consume time as well as a large amount of menstruum.

Acetic ether is a much better solvent, and the expense is the chief difficulty in the way of its use.

Water is slow in its solvent action; this, however, is in part overcome by long maceration, and then slow percolation. The tannin must be separated from the resulting aqueous solution, either by agitation with acetic ether, or by precipitation with lead acetate. In the latter process it was found possible, at a considerable sacrifice of oak bark, to procure a quantity of light coloured tannin by precipitating one half of the aqueous percolate with lead acetate, collecting the precipitate, stirring it through the other half of the percolate, and then filtering. The filtrate was very light in colour, and was either evaporated under reduced pressure and submitted to further purification to be described hereafter, or it was agitated with acetic ether, and after removal of the latter solvent, purified in the same manner.

Apart from the slowness of this process, the yield of tannin after purification was always small when water was used as a solvent.

Within the past few years acetone has appeared in commerce in a nearly pure form. Its solvent action has been suggested for several plant principles, but thus far little, if any, reference has been made to its use as a solvent for tannin, although there is good reason for believing that some manufacturers are using it for the extraction of nutgalls. It is cheaper than ether, but more expensive than alcohol. It is a better solvent of tannin than either of these, and extracts the tannin with less sugar and other carbohydrates, because of its poor solvent power over these. Its low boiling point, 56°·5, renders its recovery easy and rapid, without danger of decomposition to the tannin.

From a sample of powdered nutgalls, commercial ether extracted 59·77 per cent. of solids, while acetone extracted 62·24 per cent. of the same.

The following process, after some preliminary experiments, has been devised and thus far proven satisfactory.

The powdered oak bark was well moistened with acetone, packed in a glass percolator, and the menstruum poured on until it commenced to drop from the lower orifice, when the latter was closed with a cork, and the bark allowed to macerate for forty-eight hours. Enough of the solvent was poured on before maceration commenced to keep a thin layer of it above the drug. A glass plate smeared with petroleum was kept on top the percolator to prevent evaporation. At the expiration of the maceration period, the stopper was removed and the percolation continued rapidly until the number of litres of percolate amounted to one-half the number of kilogrammes of oak bark used. The latter was then usually found to have been exhausted. In some instances a No. 20, in others a No. 40 powder was used. In every case the acetone rapidly penetrated the drug and accomplished complete exhaustion. The acetone was removed by distillation, the first portion on a water bath, under ordinary conditions, but the last portions by the additional aid of reduced pressure. The residual product was a dark red or brown semi-solid extract. This was warmed with water until nearly all of it dissolved. After cooling, the whole was filtered, and the clear filtrate was diluted with water so long as precipitation took place. This dilution separated much of the anhydrides. The filtrate from these was of a clear red colour, and yielded no further precipitate on the addition of water. It was agitated successively with acetic ether. The acetic ether portions were mixed and the solvent recovered by distillation under reduced pressure, which yielded the tannin in a porous or "puffed up" condition. The product was then treated with cold water, and, after filtration, was again separated by agitation with acetic ether. This process was continually repeated until the tannin was readily and completely soluble in water. The tannin then possessed considerable odour of acetic ether, which was removed by solution in official ether sp. gr. 0·750, and after filtering clear, distilling off the solvent under reduced pressure. The product was then digested with absolute ether, which dissolved the small amounts of adhering resin and crystalline principles which occur along with it in the bark or result from decomposition when working it, and the tannin remained behind nearly pure, and readily and completely soluble in water.

This process was carried out on barks from the following species of oaks:—*Quercus alba*, *Q. coccinea* and its variety *tinctoria*, *Q. falcata*, *Q. palustris*, *Q. Prinus*, *Q. bicolor*, *Q. stellata*, *Q. Phelles*, and *Q. rubra*. It was found in some cases that by dissolving the acetone residue in a mixture of four parts water and one part alcohol, instead of water alone, that there was less formation of anhydrides.

A few trials were made with a modification of the purification process, in which the first acetic ether residue was dissolved in water and filtered through a freshly prepared lead compound obtained by precipitating a portion of the aqueous solution of the bark with lead acetate.

In some instances the resulting filtrate was nearly colourless, but the loss of tannin was such as not to warrant the adoption of the process for general use. It might, however, be applied in certain cases with satisfactory results. From the colourless filtrate the tannin should be removed by agitation with acetic ether, and the remainder of the general purification process then carried out.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACT.

At the Tunbridge Wells County Court, on Thursday, October 5, before his Honour Judge Cox, the case of the Pharmaceutical Society *v.* Cullen and Gain came on for hearing. It was a claim for £5, for selling chlorodyne. Mr. C. W. L. Flux, of the firm of Flux, Son, and Co., appeared for the plaintiffs, and the case was practically undefended, Mr. Gain stating that his firm would submit to judgment. He explained that the assistant who sold the chlorodyne had been instructed not to sell it. His Honour gave judgment for the amount claimed, with costs.

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At the Blackburn County Court, on October 9, before his Honour Judge Coventry, Robert Hargreaves, grocer, of 297, Union Road, Oswaldtwistle, was summoned for keeping open shop for the sale of poison contrary to the provisions of the Pharmacy Act, 1868. Mr. T. R. Grey, instructed by Messrs. Flux, Son, and Co., appeared for the plaintiffs, and in opening his case briefly explained the nature of the Act, and pointed out the danger that resulted to the public from the indiscriminate sale of poisons by unqualified traders. He stated that this was one of a number of similar cases instituted in the neighbourhood, but that the other offenders had paid the penalties incurred, and this was therefore the only case which he should have to trouble his Honour to hear. The defendant had incurred a penalty of £5 for keeping open shop for the sale of poison, namely, oxalic acid; he had also rendered himself liable to a further penalty of £5 for selling the article without a poison label, but it was not the intention of the Pharmaceutical Society to press for the recovery of the latter penalty. Arthur Foulds stated that on June 10 he purchased at defendant's shop a pennyworth of oxalic acid. The parcel produced in court was the article supplied to him. He was served by Mrs. Hargreaves. The analyst, Mr. Ernest J. Eastes, proved that the package contained oxalic acid. Defendant and his wife denied the sale. His Honour, in giving judgment, said that he could not accept the defence; he considered the case fully proved, and should give judgment for the plaintiffs for £5 and costs.

### POISONING BY STRYCHNINE.

At the Islington Coroner's Court, on Monday, Dr. Danford Thomas held an inquiry into the death of Charles William Bennett, aged ten years. The father of the deceased said that the boy was unwell on the previous Tuesday and was taken to Dr. Bower, who prescribed some medicine, including a powder. He gave the powder and some of the mixture to deceased the same evening. Shortly afterwards the boy commenced to scream and complained of sickness and stiffness. Medical aid was at once sought, but death ensued in a very brief space of time. Dr. H. F. Stokes said he had made a *post mortem* examination, and considered that death was due to strychnine poisoning. The paper that had contained the powder given to the boy had been handed to him, and he found two or three small crystals of strychnine upon it. Dr. Bower, in giving evidence, said he had prescribed a saline mixture and an ordinary two-grain calomel aperient powder. The powder was taken from a box containing twenty or thirty others, ready prepared, and was not examined before being sent out. He could not explain how strychnine came to be present, and he had been unable to find any trace of strychnine in the other powders. The coroner said that, judging from the evidence, there seemed little doubt that death was caused by the powder sent by Dr. Bower, and the latter said that he was afraid it was so. The jury returned a verdict of "death from misadventure."

## Reviews and Notices of Books.

**WRIGHT'S IMPROVED PHYSICIANS', SURGEONS', AND CONSULTANTS' VISITING LIST FOR 1894. Compiled by ROBERT SIMPSON, L.R.C.P., L.R.C.S.***

The special features of this list are its comparatively small bulk, rendering it convenient for carrying in the pocket; the accommodation for the names of a large number (160) of patients; and the insertion of narrow pages, the use of which economises time by requiring patients' names to be written once a month only. In addition to the visiting list there are pages for a consultant's record, obstetric engagements, nurses' addresses, patients' special addresses, journal and memoranda. The book is prefaced by a calendar and utero-gestation table, and a number of tables conerning poisons and antidotes, average heights and weights of man, temperature of baths, vital capacity of the lungs, weights and measures, metric system, ees due to medical men at courts of law, eruptive fevers, postal regulations, income table, etc. Everything is very compactly and conveniently arranged, and the book may with advantage be recommended by pharmacists to their medical clients.

**PRACTICAL DENTISTRY, SURGICAL AND MECHANICAL. With Appendix, numerous Formulæ, and Guide how to become a Registered Dentist. By a DENTAL SURGEON. Illustrated.***

The manner in which the author of this book has, in eighty-eight pages of loosely printed matter, accompanied with a few indifferent illustrations, treated the various subjects included in its comprehensive title, has the quality of brevity if it is not instructive. Without attempting to criticise any particular part of the book, it may be said that it is more remarkable for what is omitted than for what it contains, and it is difficult to see that the work can be of any service to the dentist, be his previous knowledge what it may.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### BELLADONNA AT THE CONFERENCE.

Sir,—In connection with the papers of Mr. Wright and Mr. Naylor on "Collodium Belladonnæ," read at the recent Conference, there are one or two points of interest which seem to have escaped notice during the discussion. As the holiday season has apparently prevented others as well as myself from calling earlier attention to these, I trust it will not be thought too late now to re-open the question, especially as this may be taken to be one of the subjects referred to by the Formulary Committee, in speaking of their delay in issuing a revised 'Formulary' till certain of the Conference papers had been fully discussed. Considering that a standard commercial sample of emplastrum belladonnæ fluidum from a well-known firm, who make a specialty of the article, and apparently manufactured either directly from the leaf or from a leaf-extract, was found to yield only ·032 per cent. of alkaloid, even the B.P.C. preparation might be looked upon as an improvement; but if the formula is to be carefully remodelled, one would like to see it done upon lines which leave less room for criticism.

The authors of both papers appear to arrive at the conclusion that a collodium belladonnæ would be best prepared from a two-in-one fluid extract of the leaf in rectified spirit, although a simple calculation from Mr. Naylor's own figures will show that 84 per cent. alcohol (s.v.r.) only extracts 61 per cent. of alcohol compared with that taken out by 65 per cent. alcohol; and of this it appears, from his concluding paragraph, at least 26 per cent. is lost—carried down by the extractive matter insoluble in the ether mixture—so that, at best, less than half (46 per cent.) only of the extractable alkaloid passes into the preparation, which is surely no great improvement upon the original formula of the B.P.C. While noticing that Mr. Naylor's figures tell rather against his own process, it may be remembered that from the experiments of Messrs. Farr and Wright (*Pharm. Journ.*, [3], xxii., 472) one might expect the differences between rectified spirit and a weaker alcohol to be comparatively slight. In fact, using eight samples of English leaf (containing ·42 to ·88 per cent. of alkaloid), the greatest difference between 80 per cent. and 60 per cent. alcohol (by volume) was only one-twelfth of the total quantity, and that in one exceptional instance, the majority showing no difference whatever. Moreover, Mr. Naylor himself finds that by treating a solid rectified spirit extract of the leaf directly with a mixture of equal parts of spirit and ether, the loss of alkaloid in the two examples quoted was only 8 and 13 per cent. respectively, showing the improvement obtainable by a simple alteration in the menstruum from a three-and-one to a one-and-one mixture of ether and spirit; and if the same is found to apply to an alcoholic extract of the root, the problem might be very simply solved, as there is every likelihood that the unsatisfactory mixed spirituous and aqueous extract of the present Pharmacopœia will be replaced by one wholly soluble in rectified spirit. Then in regard to the direct percolation of a two-in-one extract, the results of Mr. Naylor and Mr. Wright are considerably at variance. Mr. Naylor's figures show that without the use of a large quantity of spirit and subsequent evaporation, little more than half (56 per cent.) of the alkaloid removable by rectified spirit could be obtained by repercolation to a two-in-one strength. For Mr. Wright to obtain ·6 to ·8 per cent. of alkaloid in his fluid extract implies either superior manipulation, or (on the above figures) material containing 1·0 to 1·4 per cent. of alkaloid, which is scarcely to be looked for; or possibly a slip somewhere in the calculations.

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* Bristol: John Wright and Co. 5*s*. 6*d*.

* London: Offices of the *British and Colonial Druggist*. Pp. 94. 1*s*. 6*d*.

The results with Linford's ammonia process, as printed in the Journal (*ante*, p. 174), are so incomprehensible that one is compelled to infer some mistake on the part of either reporter or printer. It is to be hoped that this will be corrected, as the result of a trial of Mr. Linford's suggested process would have been very interesting for comparison. It should be noted that in the original formula (*Pharm. Journ.*, [3], xxii., 384) the ℥ii of strong liquor ammoniæ is an obvious misprint for the ʒii previously mentioned, and that the mistake has been copied into the formula as given by Mr. Naylor. That the use of ammonia in the manufacture of belladonna preparations should receive official sanction at the earliest opportunity there is no doubt. With regard to belladonna leaf I have no experimental data, but for the root, the best of all solvents is undoubtedly ammoniated spirit. In one test-experiment 20 ozs. of a particularly rich sample of powdered root yielded a first percolate of 20 fl. oz. at ·75 per cent. alkaloid, followed by a second 20 fl. oz. at ·018 per cent. Estimated by the Dunstan and Ransom method, the same sample only yielded a total of ·69 per cent. If this is found to be a normal result, the authors of the process might do well to modify it, so as to introduce ammonia during the extraction. The same root percolated for lin. belladonnæ with simple rectified spirit gave only ·595 per cent., the remaining alkaloid being easily extracted with the ammoniated menstruum.

Mr. Conroy very naturally suggests making the collodion "after the style of chloroform belladonna, viz., to employ the powdered root, add ammonia to it, dry it so as to free the alkaloid, and then to percolate with the menstruum necessary for making the collodium." This may be the method followed by Mr. Conroy, but it differs from the chloroform belladonna process of the B.P.C. in one very important particular, viz., that in the B.P.C. the ammonia is not added to the powdered, but to the bruised whole root, which has to be finally powdered after drying. The only conceivable explanation of the introduction of such an extra expenditure of time and labour into the process lies in the fact that the mere wetting and drying of the powdered root with an aqueous liquid is open to a perhaps more serious objection. Any one who tries the experiment will find that each particle of the powder becomes so coated with gummy extractive as to prevent to a large extent the solvent action of the chloroform, and in the case of a collodion-menstruum the result would probably be the same. Although hot chloroform in a Soxhlet apparatus gives a very fair extraction, there is no denying that the original method of making chloroformum belladonnæ ('Companion,' 1864) by simple percolation in the cold was an exceedingly wasteful one, and so perhaps called for semi-official modification, but my experience of the B.P.C. improvement thereupon is that after all the complicated treatment of bruising, soaking, drying, powdering, and percolating, the result obtained is not a whit better. This is a point, however, upon which the evidence of other workers would be most interesting, and I trust this prolongation of the Conference discussion may induce some members of the Committee to publish the results which led to the adoption of the formula. By percolating the powdered root directly with ammoniated chloroform, even in the cold, the whole of the alkaloid is easily extracted; but ammonia is not very freely soluble in chloroform, and a large quantity of it is absorbed by the root, so that three parts by measure of chloroform percolate are required for one part by weight of root, the alkaloidal strength of the percolate continuing nearly uniform till close upon the finish. I have therefore found the simplest way in actual practice (if not the very best in theory) is to mix the powdered root with powdered carbonate of ammonium (1 oz. to 1 lb.) and an excess of slaked lime, and then percolate directly with chloroform. Treated in this way, four-fifths of the alkaloid appears in the first one-in-one percolate. Failing, therefore, a method of making collodium belladonnæ from the alcoholic extract of the root by some modification of the present process, one would certainly recommend for trial percolation with an ammoniated menstruum, as latterly suggested by Mr. Linford, or with the addition of ammonia to the dry powder, as just described.

*London.* P. W. Squire.

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*Richmond.*—(1) There would not seem to be any advantage in using steel in preference to brass for the beams of dispensing scales. (2) There is no legal obligation to use one metal rather than the other for the purpose. (3) It is not illegal to use stamped measures of capacity for dry goods, though originally intended for liquids, or the converse, provided the purchaser suffers no loss and no fraud is committed. (4) Copies of all parliamentary publications may be obtained from Messrs. Eyre and Spottiswoode, Fetter Lane, E.C., or through any bookseller.

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## NOTICES OF MEETINGS NEXT WEEK.

### Tuesday, October 17.

*Royal Victoria Hall, London.*
"Electrical Fishes," by Dr. W. D. Halliburton.

### Wednesday, October 18.

*Western Chemists' Association* (*of London*), at 8.30 p.m.
Annual Meeting, at the Westbourne Restaurant.
Alteration of Rules.

### Thursday, October 19.

*Chemists' Assistants' Association*, at 8.30 p.m.
"A Pharmacist's Holiday," by W. Lloyd Williams.

### Saturday, October 21.

*Pharmaceutical Football Club v.* Westminster Ponsonby (Cup Match) at Shepherd's Bush, at 3.15.
Reserves *v.* Clissold Reserves, at East Finchley.

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## BOOKS, ETC., RECEIVED.

Les nouveaux hypnotiques. Par Dr. Georges Hosdaille. Paris: J. B. Baillière et Fils. Pp. 240. 8vo. 5 francs. From the Publishers.

Diseases and Injuries of the Teeth. By Morton Smale, M.R.C.S., L.S.A., L.D.S., and J. F. Colyer, L.R.C.P., M.R.C.S., L.D.S. London: Longmans, Green, and Co. Pp. i.-xiii., 1 to 423. 15*s*. From the Publishers.

A Guide to the Examination of the Urine. By J. Wickham Legg, F.R.C.P. Seventh Edition. Edited and Revised by H. Lewis Jones, M.A., M.D., F.R.C.P. London: H. K. Lewis. Pp. i.-ix., 1 to 139. Foolscap 8vo. 3*s*. 6*d*. From the Publisher.

Syphilis: Its Treatment by Intra-Muscular Injections of Soluble Mercurial Salts. By Edward Cotterell, F.R.C.S. London: John Bale and Sons. Pp. 36. From the Publisher.

Measurement of Light and Colour Sensations. By J. W. Lovibond, F.R.M.S. London: George Gill and Sons. Pp. 132. 7*s*. 6*d*. From the Publisher.

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Communications, Letters, etc., received from Messrs. Hill, Sage, Tschirch, Wright.

## THE DECOMPOSITION OF CHLOROFORM CONTAINING ALCOHOL.

BY DAVID BROWN.

It is very satisfactory to find from the article published in the *Pharmaceutical Journal* of June 10, 1893, by Dr. Schacht and Dr. Biltz, that our independent work on chloroform has led us to such concordant results. I am not, however, at one with them in so far as their statements apply to the products of the decomposition of chloroform to which alcohol has been added. They say, "Though the direct products of pure chloroform are only chlorine and carbonyl chloride, it is natural that in the case of chloroform containing alcohol the chlorine thus eliminated should act upon the alcohol and so give rise to the production of hydrochloric acid, consequently in the first stage of the decomposition of chloroform containing alcohol hydrochloric acid is always found in the place of free chlorine," and they further add, "So soon as the alcohol is consumed by the joint action of the free chlorine and carbonyl chloride directly resulting from decomposition of chloroform, the products of the change that has gone on up to that point without injurious consequences become all at once recognisable, just as if the alteration had suddenly commenced. At that point the presence of free chlorine and carbonyl chloride—the initial products of the decomposition—can be detected."

I understand by these statements that chlorine and carbonyl chloride are produced in decomposing chloroform containing alcohol, that they are consumed by the alcohol, and that therefore they cannot be recognised as such until all the alcohol has been used up. This is not in keeping with my experience, and the following experiments show that free chlorine and carbonyl chloride are not only produced in chloroform containing alcohol, but that their presence can readily be detected before the added alcohol has all been consumed, and further, that there is only a very faint reaction with silver nitrate at the time when a very marked one is obtained with zinc iodide and starch.

Samples of pure chloroform to which 0·077 per cent. of absolute alcohol had been added were exposed to sunlight in the presence of air in white glass bottles one-third filled. After nine days' exposure no signs of decomposition could be detected, whereas a sample of the same chloroform, free from alcohol, was found to be far advanced in decomposition. After fourteen days the alcohol reduced samples reacted distinctly with zinc iodide and starch and faintly with silver nitrate. The exposure was continued for five days longer, when zinc iodide and starch, as well as baryta water, gave marked reactions. A quantity of 10 C.c. was then washed with 10 C.c. water, and distinct alcohol reactions with the iodoform and Dr. Biltz's potassium bichromate tests were obtained. Similar results were also obtained after exposing a sample of specific gravity 1·490 in the presence of oxygen for thirteen days.

There may be some decomposition of the added alcohol, but it evidently does not prevent decomposition being recognised in its early stages by both zinc iodide and starch and by baryta water. It is admitted that free chlorine and carbonyl chloride are produced in chloroform containing alcohol, but I am not aware of any reason why they should show a preference to combine with the alcohol and refuse to give indications of their presence to zinc iodide and starch and baryta water. Whatever the action of the decomposition products of chloroform may be on alcohol in the proportions given, it is evident that for all practical purposes zinc iodide and starch is of equal value in detecting decomposition in alcohol, reduced chloroform, and in pure unreduced. The preservative action of alcohol on chloroform is not explained by saying that the products of decomposition combine with it to form harmless substances, some more satisfactory explanation is necessary.

That decomposition is retarded by its presence is seen by comparing the results obtained from the exposure of chloroform containing 0·077 per cent. of absolute alcohol and pure chloroform. These were exposed under similar conditions and examined at intervals. After several days the reduced samples showed no signs of decomposition, and were found to contain alcohol, while the others were decomposing rapidly and gave on analysis 0·348 per cent. carbonyl chloride, which if made to react on alcohol to produce chlorocarbonic ether and ethyl chloride would require a quantity equal to 0·323 per cent. In addition to this there is 1·329 per cent. of free hydrochloric acid, which, if it acted on alcohol to produce ethyl chloride, would decompose an additional quantity equal to 1·674 per cent., or a total of 1·997 per cent. of alcohol. The products obtained from the unreduced samples are therefore able to consume twenty-six times the quantity of alcohol added to the reduced ones which remained free from decomposition.

The chloroform employed had been washed ten times with twice its volume of water, and by Dr. Biltz's test was found to be free from alcohol; it was also free from decomposition products. It is undoubtedly necessary to add a quantity of alcohol to preserve chloroform from decomposition, but it is folly to attempt by excessive addition to prevent it under any conditions. Chloroform, either pure or with alcohol, may be kept for very long periods in darkness if not exposed to a temperature of from 90°–100° F., or *in vacuo*, but when exposed to sunlight in the presence of air decomposition sooner or later sets in. Dr. Biltz, in his admirable work on the decomposition of chloroform by light (1892), says: "There exists no chemical difference between the different kinds of chloroform when it has been properly purified." This statement, coming from one who has devoted so much time to the chemistry of chloroform, is very strong testimony in favour of the position I have so long held, and should help to convince those who still contend that because a substance like chloroform is prepared from this, that, or the other substance, it must necessarily be purer than another prepared from something else.

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## PHARMACY IN PERSIA.*

BY M. BONATI, TEHERAN.

Ten years ago no European pharmacy existed in Persia. Native pharmacists, or rather quacks, abounded, and the common people, in their ignorance and simplicity, were robbed by them without mercy. European civilisation began to be introduced into Persia, however, chiefly as a result of the Shah's visits to Europe. It is necessary to realise that Persia is lacking almost completely in means of easy communication with civilised peoples, the journeys being long and difficult. Naturally, therefore, European civilisation is almost unknown there, and the old customs of the country are perpetuated. Another obstacle to the spread of more advanced ideas is the religious fanaticism which keeps the Persians from all contact with Europeans.

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* From the *Journal der Pharmacie von Elsass-Lothringen*. Being the substance of a letter received from the European pharmacy at Teheran (A. Schwerin, Pharmacist to the Shah).

Dr. Tholozan, chief physician to the Shah, and Dr. Albe, conceived the idea of establishing a European pharmacy at Teheran, and M. A. Schwerin, son-in-law of the latter, was offered the post of principal. The place chosen for the pharmacy was within the palace of the Shah, in a building within the walls which hide the palace proper from the public view. At first the fittings were very poor, at least from our point of view, and fully a year was occupied in getting together the stock of drugs and other materials. Conveyance is almost exclusively effected by beasts of burden, camels, horses, etc., and is naturally very slow. The European reader will probably be interested to know how this carriage is effected.

Teheran being the capital, the place of residence of the Shah, and situated in the richest part of Persia, all the commerce of the country is concentrated there. It is connected on different sides with three commercial routes:

(1) Caspian Sea: Resht, Kazbin, Teheran (300 Km.); (2) Black Sea: Trebizond, Dschulfa, Tabris, Kazbin, Teheran (1,500 Km.); (3) Persian Gulf: Bushire, Shiraz, Ispahan, Teheran (1,200 Km.).

For transporting boxes, asses, mules, horses, and camels are made use of, the choice being decided by the nature of the country and climate. In mountainous regions the ass, the mule, and the horse are preferred, and the same in wet, out of the way, districts, as, for example, Ghilan, near Resht. In the vast sandy plains and deserts carriage can only be effected on the back of the camel, this method being preferred to all others. The animal kneels down to receive its load or to be freed from it on arrival at the halting place, but the other beasts of burden cannot do this. The drivers (*tchervadars*) hoist the boxes upon the backs of the latter, alternately on each side so as to balance the load. At the end of the journey they simply untie the ropes and the boxes fall to the right or left, as the case may be. As this performance is repeated at least forty times during the journey, the boxes and their contents suffer, as may well be believed. It will readily be conceived also that the packages roughly used in this manner arrive frequently with considerably damaged contents, and may even contain nothing but fragments. The transport of glass and other fragile materials can only be effected therefore on camels, and by the Trebizond route, the only one which can be traversed throughout its whole length by these animals, and unfortunately the longest.

On the Caspian Sea route the camel can hardly travel except between Kazbin and Teheran. The high mountains of the Elburz range do not suit them any more than the damp and marshy regions of the Ghilan district. The same difficulty is experienced on a great part of the Bushire route. On each of the different roads there are stations (*tchapar chanehs*) situated from 25 to 30 Km. apart. The weight of the boxes is limited to a maximum of 80 to 90 Kg. They are balanced in pairs on pack-saddles, which carry then about 80 Kg. on each side. It is almost incredible that an animal can bear such a weight (160 Kg.) upon roads often hilly and always in a bad state. On an average, the drivers cover one or two stages daily, that is to say, from 5 or 6 to 10 or 12 *farsaks*, equal to about 6 Km. each. Under these circumstances, a box brought from Bushire on the Persian Gulf is on the road, which, as already said, extends about 1,200 Km. to Teheran, during forty to fifty days. The expense of carriage depends upon the contractors. At the present time the Bushire route is the least expensive, owing to the road not being overcrowded with traffic. We have as much as possible, therefore, despatched *viâ* Bushire.

To ensure the safe arrival of goods there are certain details to be observed—the dimensions of the packing-cases, the manner of their construction, and the mode of packing. Oblong cases, about 80 to 120 Cms. long, are preferred, as they can then be always loaded in the same fashion, which is of importance. The goods being placed within, are closed up so as to leave no intervening spaces, in order to prevent them moving about. Bottles, etc., are filled up to the corks, except in the case of certain liquids. Heavy substances, such as preparations of mercury, etc., are carried in strong linen parcels, enclosed in parchment. Quinine generally requires a special method of packing. It usually arrives in bottles containing 1 to 8 *miscals* (a *miscal* equals 4·6 Gm.), 1 *sir* (equals 16 *miscals*, or 73·6 Gm.), or 1 Kg. The bottles only reach us intact when they are laid lengthways in the case. They are then carried horizontally, and the contents are not continually jerked against the sides of the glass. If placed otherwise, the friction caused by the motion reduces the crystalline needles to powder, and the bottles arrive only half full. The Persian is very mistrustful, and will not use any but crystalline quinine, so that this may be a source of loss. Liquids, soft paraffin, etc., arrive in well soldered cans; volatile liquids in well stoppered bottles; and acids in receivers with carefully ground glass stoppers (*bonbonnes à l'émeri*), packed in strong cases. In spite of all possible precautions, however, accidents are not uncommon and astonish no one.

The carriage of an ordinary box from Europe costs actually 10 to 15 *tomans* (worth, at the current rate, about five shillings each), import duties included. When the cases exceed the dimensions already given, one is at the mercy of the drivers, who decide the price, for transport then becomes very difficult, since it is necessary to carry them on litters between two mules, or on double litters with two pairs of mules.

Pending the arrival of the bottles, phials, stock, etc., the cupboards, shelves, and other fixtures for the new pharmacy were prepared by a Persian joiner and cabinet-maker, in accordance with photographs of a

European establishment. The pharmacy is arranged after the German fashion, the general appearance greatly resembling, except for some details of ornamentation in the local style, the pharmacies in Alsace. The pharmaceutical practice, of course, differs from ours. Teheran being a somewhat cosmopolitan city, the dispensing is very varied and even at times very complicated, seeing the differences between the diverse pharmacopœias upon which the numerous prescriptions are based. Persian, French, English, Russian, German, etc., prescriptions follow each other, and have little resemblance. In dispensing for the natives, their religion forbids the use of wines, spirits, etc., so tinctures must be replaced by aqueous extracts, whilst soft paraffin is substituted for lard. Prescriptions for the service of his Majesty are written in French, but some of the single women are treated by Persian doctors. For prescriptions with directions in Persian we have two *mirzas* (native clerks), and they deal chiefly with pills, powders, various salts of quinine, ointments, pomades, but rarely draughts.

Of course, there is no fixed scale of charges. The price is arranged at will, according to the purse of the customer. For the common people we follow ordinarily the German scale, and obtain compensation from the bulky purses of the rich Persians and Europeans in Teheran. The average price of a prescription is from 4 to 8 *krans* (a *kran* equals 80 Pf. or 9*d*.). His Majesty pays 2 to 3 *tomans*, even for a simple ointment. During epidemics prices rise, being regulated according to the stock of the pharmacy. Thus, during the last epidemic of cholera a bottle of carbolic acid cost 20, and at last 30 *krans*. Prescriptions ordering 100 to 150 Dover's powders cost 50 to 60 *krans*; 40 Gm. of bismuth salicylate, 20 *krans*; a kilogramme of calcium chloride, 10 *krans*, etc.

Besides the dispensing and retail business we do a wholesale business with the whole of Persia. Merchants who come to Teheran to sell their wares, such as carpets, gems, fruits, etc., provide themselves there with pharmaceutical products of all kinds, which they subsequently retail in the provinces. It is quinine which is chiefly in demand, and we sell not less than 400 to 500 Kg. of it per annum. We obtain it from all the countries of Europe, that is, both the sulphate and hydrochlorate of quinine from Germany, France (*quinine Pelletier*), Italy, England, etc. We get all the products ready prepared for sale, that is to say, in packets or bottles, according to the weights used in the country (1, 2, 3, etc., *miscals*; 1, 2, 3, 4 to 10 *sirs*; 1 *batman* (equals 40 *sirs* or 2·944 Kg.), etc.). This is done to save time and for readiness of sale. On account of the extensive business done and the length of time the goods take to arrive here, we are obliged to have a considerable stock. Thus, we have already in stock 40 to 50 Kg. of the salicylates of bismuth and sodium, of calomel, salol, oxide of mercury, boric acid; 20 to 30 Kg. of antipyrin; 80 to 100 Kg. of bismuth subnitrate and of creolin; 200 to 300 Kg. of carbolic acid, etc., etc. If, by chance, one of these substances is wanting before the end of the period provided for, we can obtain some by post—as a sample of no value or registered—and are thus able to receive it a month after the dispatch of the order. Or, in certain cases, we can write to Tiflis, whence a package reaches us in two months or two months and a half. Besides pharmaceutical products we also keep photographic requisites (the Persians are great amateur photographers, and willingly pay dearly for their amusement), surgical apparatus, medicinal works, and medicine chests (price from 10 to 30 *tomans*, according to size). The richer Persians like to provide the latter for use on their journies.

As regards the products of the country, we are able to use the opium, saffron, cochineal, myrrh, and almonds. Persian opium is in sticks from 15 to 20 Cm. long, 1 Cm. thick, and weighing about 20 to 25 Gm. It is very pure, and can be used as it is to prepare the powder, because it is very dry and can be powdered easily. It is hardly known in Europe, the greater part being consumed in Persia, where it is smoked in the *kalyan* (a native pipe). The price of a stick of the opium is a *kran*. Other medicinal products of Persia, as asafœtida, ammoniacum, galbanum, etc., cannot be used as they are. It is necessary to purify them, and it is preferable, therefore, to obtain them from Europe. One substance of great interest is hashish (*Tcherée* or *Heschisché* in Persian). This also is smoked in the *kalyan*. A piece weighing from 4 to 20 grains is placed in the bowl of the pipe, and the smoke from it is swallowed. This preparation is obtained by rubbing the flowering tops and leaves of Indian hemp for several hours and with some force on rough carpets of coarse wool, in such a fashion that the juice (mingled with the perspiration (?) from the hand of the workman engaged in this tedious work), being of too dense a consistence to penetrate the texture of the carpet, sticks to the rough surface, whence it is removed by means of a knife and formed into pellets or little sticks of a greenish-yellow colour. The carpet from which the first quality of hashish has been thus removed is washed or rather worked up with a small quantity of water, and the extract obtained, when dried in the sun, furnishes a kind of *Tcherée* of inferior quality and darker colour. This is chiefly smoked by the dervishes and street story-tellers to excite them and transport them in dreams.

## PHAGOCYTOSIS.*

BY HAROLD C. ERNST, M.D.

(*Continued from page* 308.)

Metschnikoff's first paper upon the subject was published some ten years ago, and has been followed rapidly by others in the same direction, until the mass of material that he has collected is enormous, and absolutely astonishing to one who becomes familiar with it for the first time. The literature this experimenter has produced is scattered through the pages of many journals, both French and German, although of late years most of his original work is to be found in the volumes of the 'Annales de l'Institut Pasteur.'

As applied to the complex, multicellular organisms, much of the original work was done with the bacillus of anthrax, both in its full strength and in an attenuated condition, and the experiments were conducted upon both warm and cold-blooded animals—in the former case upon rabbits, guinea-pigs, and rats, and in the latter upon daphnia, other small animals, and especially upon frogs. With the latter, many of the experiments were, of necessity, made upon them at a temperature above that at which they ordinarily lived; and while, at their normal temperature, they are insusceptible to the action of the anthrax bacilli, this immunity disappears when their bodies are raised to such a temperature as will permit of the development of these bacilli. According to Metschnikoff, the immunity at the lower temperature is due, not alone to the unfavourable condition for the growth of the bacilli, but also to the phagocytic action of the white corpuscles, which at this temperature—their normal one—are found to be full of the bacilli, a fact which is not observed when the animal is raised to a higher temperature and becomes susceptible to the disease; he explaining this susceptibility by the hindrance to the action of the white corpuscles by their unnatural temperature, whilst Baumgarten remarks that frogs raised to such a temperature would die anyhow, but omits to state how this occurs so early as is the case after inoculation with anthrax bacilli.

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* Read before the Boston Society for Medical Improvement, April 10, 1893. Reprinted from the *Boston Medical and Surgical Journal.*

The experiments, however, were not limited to work with the virus of anthrax, either attenuated or of full virulence; but investigations have been made upon many other diseases, notably chicken-cholera, tuberculosis (as a type of a chronic inflammation), septicæmias of various kinds, and serous inflammations. In the latter forms of reaction, it is true that very few cells possessed of phagocytic action are to be seen; but, as Metschnikoff says, it is equally true that these forms of inflammation are as yet but incompletely understood, and if, because a thing has not been seen, its existence be absolutely denied, an unscientific conclusion would be reached.

As a result of all this work, which has been supported by what Metschnikoff considers as of equal importance, the pursuit of similar studies upon invertebrates as well as vertebrates, the general conclusion has been reached from the observed phenomena, that, in nearly all (if not all) of the infectious diseases, an important part in the destruction of the invading bacteria is played by certain individual cells endowed with phagocytic powers. Many interesting properties of the cells of animal tissues have been brought out as well.

In the first place, it seems to have been definitely determined that the phagocytic power is not confined by any means to the leucocytes, derived from the white blood-corpuscles, but that the single nucleated cells of a larger size than the ordinary multi-nuclear bodies commonly seen in any purulent exudation are derived from some of the fixed tissue elements in the neighbourhood of the reacting locality. These are the "macrophagocytes," which are always possessed of a single nucleus, and are usually larger than their neighbours, and are so called to distinguish them from the "microphagocytes" that are multi-nuclear and are derived from the leucocytes or white blood-corpuscles; the main distinction in all cases being the possession of more than one nucleus, and not the size, which may vary very slightly. (The further division of the leucocytes may be found in Metschnikoff's book on "Inflammation," p. 131). These macrophagocytes are possessed of the power, under certain conditions, of englobing and destroying the microphagocytes as well as bacteria; and in those cases in which they are freely formed, seem to have more active phagocytic properties, as against bacteria, than have the microphagocytes. In a comparatively recent work, Metschnikoff also describes the formation of phagocytes from the invaded muscular tissue, to which he has given the name of "myophagocytes."[*]

Another of the exceedingly important properties of the cells that these recent investigations has brought out is that of "chemiotaxis," which is the property that movable cells have of responding to irritation of any kind—either chemical, as in the case of simple chemical irritants, or vital, as in the case of invading bacteria, the latter, of course, being frequently double in its action, both chemical and vital. This response to external irritation is of an active kind, and is manifested by actual movement towards, or away from, the irritant material. These two classes of movement are called positive chemiotaxis and negative chemiotaxis, according as the movement is towards or away from the invaded part; and the property is manifestly an exceedingly powerful one, for it is seen to occur in all kinds of experiments and natural phenomena of the sort that would call it out, and is an occurrence familiar to every one who has ever seen a swelling in any of the vital tissues, the result of any sort of irritation.

From all the work that he and his followers have done in this direction, Metschnikoff reaches his well-known conclusions in regard to phagocytosis: that it is an active factor in the production of immunity from an infectious disease or in the recovery from such a disease; and that there is always an effort made in this direction by such cells of the organism as may be possessed of this property of englobing and destroying bacteria.

The objections that have been raised to his conclusions are many, and have come very largely from German observers. Negative evidence in such a question may well be excluded; and an examination of the positive facts brought forward is exceedingly interesting.

Among the most active opponents of the assertions made by Metschnikoff was Christmas-Dirckinck-Holmfeld.[†] Defining his idea of Metschnikoff's idea of phagocytosis, he says that it is the ability of the leucocytes of various animals to "eat" (and thereby destroy) invading bacteria, and that immunity against infectious disease depends upon this ability of the leucocytes; that every organism is immune to all parasitic diseases, the parasites of which can be eaten by the phagocytes of the organism, whilst an organism cannot defend itself against any microparasite whose chemical or physiological properties are such that it cannot be destroyed by the leucocytes. This theory was at first received with enthusiasm until Baumgarten objected to it.[*] An answer to his objections being made by Metschnikoff,[†] Ribbert[‡] made certain experiments with the *Aspergillus fumigatus* and *flavescens*, by injections into the ear vein of rabbits. As a result, he saw a wall of leucocytes built about the spores (in the lung, the liver, and the spleen), by means of which their sprouting was circumscribed and was sometimes prevented entirely; and he concluded that the leucocytes prevented the development by suffocation, that is, by preventing the access of oxygen to the spores.

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[*] 'Annales de l'Institut. Pasteur,' 1892, No. 1.

[†] 'Fort. der Med.,' 1887, S. 401.

Wyssokowitsch[§] found that after the injection of non-pathogenic bacteria into the blood-vessels, some of them were taken up by the endothelial cells of the capillaries, but he could determine no activity of the white blood-corpuscles in taking up the bacteria, and therefore concluded that phagocytosis plays but a subordinate part in producing the harmlessness of bacteria. Such a conclusion at the present time, from such experiments, would certainly not be justified.

The special theoretical objections raised by Christmas-Dirckinck Holmfeld are that Metschnikoff's experiments were made mostly upon cold-blooded animals kept at a temperature of 36° C., and that his experiments upon warm-blooded animals were very few; that it is true enough that in warm-blooded animals and in virulent diseases, like mouse-septicæmia and tuberculosis, there is manifest a tendency on the part of the cells to take up the bacteria, but it is also true that the bacteria of suppuration are almost never seen in the cells. He considers, also, that not enough attention was paid to the changes in the local site of the inoculation, and devoted his experiments to showing that these may be of the utmost importance. He used rabbits, mice and white rats for animals, and anthrax bacilli for material; the latter because Metschnikoff had done so, and also because they are easily seen, easily cultivated and characteristic. Rabbits and mice are very susceptible, whilst rats are very insusceptible—in fact, almost immune—to inoculations of these bacilli; so that all sorts of variation of effect may be seen by the use of these three kinds of animals. "The results show, constantly, a variation in the changes at the point of inoculation, in accordance with the greater or less susceptibility of the animal towards the material employed." Subcutaneous inoculation in mice and rabbits gave, twenty-four hours afterwards, a slight amount of clear serous exudation, that contained many anthrax rods, but no (or almost no) pus-corpuscles, and the number of these did not intrease as time went on; there was only a local œdema, never any suppuration. With rats, on the other hand, the conditions found were different. In all these animals experimented upon, pus constantly occurred in the secretion from the wound, the amount varying with the virulence of the material used and the greater or less susceptibility of the individual animal to the virus; the older the rat, the more marked the amount of pus.

Employment of attenuated virus gave a very different result, so far as rabbits and mice were concerned; in this case there always occurring a small localised suppuration.

The results of his inoculation experiments were, briefly, as follows: inoculation of anthrax bacilli of full virulence produced in very susceptible animals (rabbits and mice) a very slight (or almost no) reaction at the seat of the inoculation; suppuration never occurred; the inoculated bacteria quickly found their way throughout the organism by means of the lymph- and blood-channels, where they developed with great rapidity and produced the death of the animals. In slightly susceptible animals, the inoculated material produces a perceptible suppurative reaction in the tissues, and this pus-formation is in proportion to the greater or less susceptibility of the animals experimented upon; the less the susceptibility the greater the amount of pus-formation.

Pus-formation, therefore, plays no slight part in the determination of the greater or less susceptibility of animals towards anthrax; and not only in this disease, but the same thing is true of many of the infectious diseases. It is a common observation that the most virulent infectious diseases—those in which death occurs in a very short time (from hours to days)—are precisely those in which pus-formation does not occur; whilst those that are slow in action, in which fatal results occur late, if at all, are equally those in which marked pus-formation is seen.

This is perfectly true; but the facts may easily be interpreted in the line of believing that, where pus-formation does not occur, the phagocytic power of the body cells has been overcome by some influence upon their chemiotactic properties, rather than to make it a ground for rejecting recorded observations, or for relying upon the explanations of our author that follow. He considers that the means by which the bacteria are rendered harmless are to be ascribed much more to chemico-biological action than to any power of the cells to absorb corpuscular elements, which is Metschnikoff's "anomalous supposition." He further states that by the observation of the behaviour of the pus in insusceptible animals it can be seen that the cells play no such part as is ascribed to them by Metschnikoff; for example, in the pus in rats inoculated with anthrax, and in animals in which the white corpuscles could with ease destroy the bacilli, very few of the bacteria are to be found in the cells; most of them are lying free in the fluids, and very few of them in the cells, whilst these show a slight tendency only to destroy the bacilli. The inoculation of attenuated anthrax-cultures in rabbits and mice shows the same thing—only rarely is there a rod in the cells; and in rabbits inoculated with cultures of full virulence, when pus-corpuscles are found at all, it is only here and there that a rod is to be seen in a cell; and the same is true of mice.

These results, the author claims, and with justice, are in sharp contrast to those of Metschnikoff, who, he says, used mostly warm-stage preparations from warm-blooded animals, with no observations in the living animals, most of his work being done upon cold-blooded animals, and therefore inapplicable to the warm-blooded races.

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[*] *Berl. klin. Woch.*, 1884; and *Lehrbuch der Path. Mykol.*, 1886.

[†] 'Ueber den Kampf der Zellen gegen Erysipelkokken: Virch. Arch., Bd. 107.

[‡] 'Unt. ü. d. Schicksal Path. Pilze im Organismus:' *Deut. Med. Woch.*, 1885, No. 31.

[§] 'U. d. Schicksal d. ins. Blut injicierten Mikroorganismen im Korper des Wirbelthieren:' Zeit. f. Hyg., Bd. I., No. 1.

He gives other experiments, tending, as he thinks, to show that the bacilli are killed before phagocytosis can be supposed to have had time enough to take effect, and considers that the overcoming of these bacteria must be due either to the absence of oxygen or else to the production, during their development, of some material hurtful to their own existence.

*(To be continued.)*

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## SOME WILD PLANTS OF OUR CINNAMON GARDENS.

### BY E. T. HOOLE.

1. *Wrightea Zeylanica*.—(Sin. *Idda*; Tamil, *Vedpalai*). This is a small milky shrub belonging to the natural order Apocynaceæ, and is very common in the cinnamon gardens. It looks somewhat like the tea plant at a distance. The leaves are oblong, acuminate, smooth, and bright green on each side. The white flowers, which have a kind of silky tuft, are largely collected for offering at the Hindu and Buddhist temples. The pods contain a silky wool, which is useful for stuffing cushions. The bark is astringent and bitter, and also deemed a febrifuge. An infusion of the bark is given by the *vederalas* in cases of chronic dysentery.

2. *Exacum Zeylanicum*.—(Sin. *Ginihiriya*). This is a species of gentian. It rises to a foot or two in height, and looks very beautiful with its bright, blue-purple flowers. The stem is square and erect, and the upper leaves enclose the flowers in pairs. The whole plant, and especially the root, is very bitter, and is devoid of astringency. It is a powerful tonic and febrifuge. In short, it may be remarked that this herb has probably the same virtues as the yellow European gentian (*Gentiana lutea*), and it may be that we seek at a distance what lies at the very threshold of our doors.

3. *Cuscuta reflexa*.—(Sin. *Agamula-netiwela*). This is a parasitic leafless creeper which preys on the cinnamon bush, and belongs to the same family as the "dodder." The Sinhalese name means "a creeper that has no beginning or end." The Tamils call it *Muda-kottan*, and consider it a specific for cuts, fractures, and dislocations. Wonderful stories, which try one's credulity, are told of the power of this plant to make flesh adhere and cure wounds, and the remarkable success of some native doctors in surgical treatment is attributed to the secret use of this plant. One thing, however, can be said with certainty about its virtues, the mucilaginous juice has a very soothing effect when it is applied in the form of a poultice.

4. *Acalypha Indica*.—This is a common annual herb with greenish flowers, belonging to the natural order Euphorbiaceæ. It is called *Kuppemenia* by the Sinhalese and Tamils. It is reported to have a peculiar effect on the cat, which has sometimes been noticed to play about with great fondness round the plant. A decoction of the leaves has laxative properties, and the root is a cathartic.

5. *Hemidesmus Indicus*.—This plant is known as *iramusu* in Sinhalese and *nannári* in Tamil. It belongs to the order Asclepiadeæ, and is a perennial with a thin woody creeping stem and small lanceolate, smooth and shining leaves, streaked with white along the midrib. Its root is long and slender, with few ramifications, covered with rust-coloured fragrant bark, which keeps its odour even after drying. The root is popularly employed all over the island as a substitute for sarsaparilla (*Smilax*), and is very highly spoken of. Its diuretic property is very remarkable. It also acts as a diaphoretic and tonic, and increases the appetite, while it purifies the blood. The taste and smell of the infusion of the root are balmy and sweet. It has been used with the most decided benefit in numerous cases of the description in which sarsaparilla is generally given, and, indeed, it is said that the activity of this medicine is much more decided than that of sarsaparilla itself.—*Tropical Agriculturist.*

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## GUTTA-PERCHA.

### BY O. OESTERLÉ.

Gutta-percha (preferably getah-pertcha) is a collective name applying to the product obtained by the induration of the milk sap of several different trees, of which the one formerly best known, *Isonandra Gutta* (Hooker), or *Palaquium Gutta*, has now almost disappeared, owing to the felling of the trees to obtain the juice, and their consequent destruction. According to Burck, several other species of *Palaquium* were employed in 1884 as sources of gutta-percha, notably *P. Borneense*, *P. Trenbii*, and *P. Leerii*. A somewhat similar juice is also yielded by other members of the sapotaceous family, but the products thus obtained from *Sideroxylon*, *Chrysophyllum*, and *Mimusops* are of little or no industrial value. The author has examined gutta-percha obtained from *P. Leerii*, and found it practically identical with the ordinary commercial article; it consisted of *gutta*, $(C_{10}H_{16})n$; *alban*, $C_{14}H_{64}O_2$; and *fluavil*, $(C_{10}H_{16}O)n$, the latter being present in larger quantity in some specimens than in others, and producing a corresponding deteriorating effect on the physical qualities of the mass; whereas an increased proportion of alban seems to be without this effect (*Arch. Pharm.*, 230, 641).

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## LIQUORICE IN THE CAUCASUS.

The inhabitants of Elizabethpol and Baku derive considerable benefit from liquorice (*Glycyrrhiza glabra*), which grows wild, needs no cultivation, and multiplies spontaneously. In 1878 two Greeks turned their attention to the large quantities of liquorice in Caucasia; in 1886 they erected a large factory for drying and pressing the liquorice, which they annually export to America. The remunerative trade soon attracted others, and to-day there exist four prominent commercial houses which carry on a wholesale trade in liquorice, and two of which have erected extract factories in this country. Annually there are produced about 108,339,000 pounds of raw liquorice, which, after drying, yields 36,113,000 pounds of marketable merchandise. For raw liquorice the factories pay on the average 11 cents per 100 pouuds.—Extract from U.S. Report in *Kew Bulletin*.

The Pharmaceutical Journal
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, OCTOBER 21, 1893.*

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## THE MEDICINE STAMP ACT.

IN view of the fact that suggestions for amendment of the law relating to the imposition of stamp duty upon medicines have recently been made in several quarters, it will, perhaps, be useful to direct attention to the unfavourable influence exercised by the last alteration of the law concerning this matter, and to some other points which have not hitherto been noticed in regard to the stamp duty. The alteration of the licence duty was unquestionably a change in the wrong direction, for although equalisation of the amount charged in town and country for a licence to sell stamped medicines was desirable and appropriate, a great mistake was made in reducing the amount of duty to so small a sum as five shillings. The consequence has been that the number of vendors of stamped medicines has increased very largely, and an immense impetus has been given to the sale of these preparations. No argument is required to show that, apart from the effect thus produced in regard to the public, great damage has been done to legally qualified practitioners of medicine and pharmacy. It is, therefore, desirable that any proposed further alteration of the law should be thoroughly well considered, and its consequences taken into account beforehand.

Those who are in the habit of regarding the Medicine Stamp Act with disfavour have probably failed to recognise the fact that, at the time it was passed, its provisions served as a protection of the professional and trade interests of medical men and chemists. As furnishing a means of restricting the unorthodox supply of medicine, the Medicine Stamp Act may, in fact, be considered as having been in some measure an anticipation of the later Pharmacy Acts. The tax it imposed upon medicines did not apply to medicines supplied by regular practitioners of medicine or pharmacy, or to medicines authoritatively recognised as being suitable for the relief of disease; but solely to such as have been commonly known as "quack medicines," compounded and supplied for various purposes by persons who need not possess any competent knowledge of medicine or of pharmacy. In that sense the Act afforded protection to regularly qualified practitioners, and means by which the extension of irregular medication might have been considerably prevented. Unfortunately chemists have, on the contrary, aided the extension of the trade in stamped medicines, and by their assistance in supplementing the recommendation of these articles in advertisements, have very materially contributed to the increase of their use by the public.

It is now too late to do more than take warning from the mistake that was made in adopting the line of action above referred to, and in this respect the question seems deserving of consideration whether a repeal of the Medicine Stamp Act would not be an aggravation of the evils now complained of rather than the reverse. In support of the view above expressed, and also as suggestive of some more reasonable modification of the incidence of the Act, reference may be made to the provisions for special exemptions which have not hitherto been much regarded. The third clause of these provisions shows very clearly that it was the intention of the legislature to make a distinction between the proprietary vendors of "quack medicines" and regular practitioners of medicine or chemists and druggists who had been duly trained to their business by serving a regular apprenticeship. In the case of such persons the sale of medicinal preparations that were "known, admitted, and approved of in the prevention, cure, or relief of any disorder, malady, ailment, or complaint incident to or in any wise affecting the human body," is made exempt from medicine stamp duty. The provisions are appended that the persons preparing or vending such medicines shall not have or claim any secret or proprietary right, that the medicines shall not have been patented, and that they shall not have been advertised or recommended by the owners, makers, or "original or first vendors" of them as nostrums or proprietary medicines, or as specifics, or as beneficial as remedies. Mr. ALPE is of opinion that the applicability of this exemption in practice is very small, but, in regard to liability to stamp duty, it appears to establish very plainly a distinction between recognised medicines and those which were not recognised by medical authority. In that respect it seems to be worth consideration as a possible means of removing difficulties.

## PRESCRIBING BY CHEMISTS.

IN commenting upon the case at Lambeth (see report on page 339)—where a chemist's son, who was not himself registered as a chemist and druggist, was shown to have prescribed for an ailing child which subsequently died—the *Globe* remarks that the druggist "requires protection from a public which imperatively insists upon having his opinion," and suggests that if he refuses to give advice to his customers, when asked, he may as well put up his shutters. This is, however, an extreme view. We see no reason why, by proper exercise of discretion, the chemist and druggist may not abstain from needlessly infringing upon the province of the medical practitioner without prejudicially affecting the susceptibilities of his customers or causing injury to his business. In consequence of the peculiar relations, or want of relations, that exist between the general public and the medical profession in English-speaking countries, it has devolved upon the pharmacist to assist in the education of laymen as to their physical necessities and the proper means of ministering to these.

By some means or other, in the course of centuries, the idea of dependence upon trained individuals for advice and assistance when out of health has given place in this country to that of self-help in medical treatment. As a result an enormous traffic has grown up, in the retail sale of drugs, and, very naturally, purchasers have become accustomed to supplement their necessarily scanty and imperfect knowledge of the uses and action of these drugs, by appealing to the retailer for further information. It is a very short step from this to the position of asking the latter to recommend remedies for certain purposes, and, though the druggist may gain no pecuniary benefit save the profit on what he actually sells, the further he advances in this direction the more he lays himself open to the charge of unprofessional conduct, as pretending to a position and authority which are not justified by his training or the nature of his occupation. As suggested above, then, it becomes the duty of the conscientious pharmacist, when opportunity offers, to endeavour to convince those who apply to him for advice regarding their bodily ailments that the proper course is not to experiment or allow others to experiment upon them, but to seek for assistance in the proper quarter. The result of such a course of procedure would be the establishment of much more cordial relations between medical practitioners and pharmacists generally, and it should be said that the business of the latter must be far from what it ought to be, and what their exertions might make it, if the risk of refusal to do what they are not qualified to do is so great as to threaten their business existence.

The objection made by the writer in the *Globe* to the remarks which the Coroner is reported to have made in reference to this case appears to be based upon a misconception. The remark that chemists, whether qualified or unqualified, have no right to prescribe for children—as we understand it—has an ethical rather than a legal bearing. There is no law against prescribing or against practising medicine, provided they fall short of "practising as an apothecary," and so far as legal obligation is concerned the chemist and druggist is under no greater disability than other members of the community. It is only on the ground of ethical considerations that it is undesirable, and, in fact, improper for the pharmacist or the chemist and druggist to prescribe or practise medicine. The naturally intimate relation of the pharmacist's business to the medical man's practice is the main reason why he should not exceed the limits of his own proper occupation. The necessity, in the case of medical practitioners, for special knowledge and training to ensure proper treatment, is, of course, a further reason, and the fact that the Pharmacy Acts specially exclude knowledge of that kind from the qualification to practice pharmacy sufficiently indicates the line of demarcation which ought to be drawn between that occupation and the practice of medicine. But, unfortunately, that natural distinction has been disregarded and obscured by long-continued usage on the part of medical practitioners as well as chemists and druggists, and, as a consequence, a large portion of the public believes that medical assistance is to be obtained equally as well as drugs, at what is popularly known as the "doctor's shop."

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## FORTHCOMING NEW BOOKS.

A very large number of scientific works, particularly text-books, are announced for publication during the present season. Amongst others, there will be 'Organic Chemistry for Beginners,' by Dr. G. S. Turpin; 'Physiology for Beginners,' by Professor Michael Foster, F.R.S., and Dr. L. E. Shore; 'Essays in Historical Chemistry,' by Professor T. E. Thorpe, F.R.S.; 'The Rise and Development of Organic Chemistry,' by the late C. Schorlemmer, F.R.S., translated and edited by Professor Smithells, Yorkshire College, Leeds; 'A Text-Book of the Physiological Chemistry of the Animal Body,' by Dr. Arthur Gamgee, F.R.S.; 'Elementary Course of Practical Science,' by Hugh Gordon; The Collected Works of Thomas Henry Huxley, F.R.S.; 'Systematic Survey of the Organic Matters,' by Drs. G. Schultz and P. Julius; 'Text-Book of the Diseases of Trees,' by Professor R. Hartig; and 'Methods of Histological Research,' by Dr. C. V. Kahlden, all published by Macmillan and Co. 'A Student's Text-Book on Botany,' by Dr. Sidney H. Vines; 'Handbook of Systematic Botany,' by Dr. E. Warming, translated and edited by M. C. Potter, M.A.; 'Flowering Plants,' by James Britten; and 'Grasses,' by W. Hutchinson, are announced by Swan, Sonnenschein and Co. Several technological manuals, including 'Oils, Fats, Waxes, and Allied Materials,' by Dr. C. R. Alder Wright, F.R.S.; 'Agricultural Chemistry and Analysis: A Practical Handbook for the Use of Agricultural Students,' by Dr. J. M. H. Munro; 'Dairy Chemistry,' by H. Droop Richmond; and 'Petroleum,' by Boverton Redwood; together with 'A Text-Book of Physics,' by Dr. J. H. Poynting, F.R.S., and J. J. Thomson, F.R.S., will be published by Charles Griffin and Co. 'A Text-Book on the Practical Physiology of Plants,' by Francis Darwin and E. H. Acton; 'On Fossil Plants,' by A. C. Seward; and 'An Introduction to the Study of Botany,' by Francis Darwin, are in preparation for the Cambridge University Press. Other prospective works are 'Chemistry for Beginners (Organic),' by R. L. Taylor (Sampson Low, Marston and Co.);

'Illustrations of the Principal Natural Orders of the Vegetable Kingdom,' by Dr. D. Oliver, F.R.S., with 109 plates by W. H. Fitch (Chapman and Hall); 'Elementary Qualitative Analysis,' by W. Briggs and Dr. R. W. Stewart (University Correspondence Press); 'The Life of Professor Owen,' by the Rev. Richard Owen (Murray); 'A Manual of Crystallography,' by M. H. N. Story-Maskelyne, F.R.S., and Adler's 'Alternating Generations, a Biological Study of Oakgalls and Gallflies,' translated by C. R. Straton (Clarendon Press); 'Agricultural Analysis,' by F. T. Addyman, and 'Micro-Organisms in Water, their Significance, Identification, and Removal, together with an Account of the Bacteriological Methods involved in their Investigation,' by Professor Percy Frankland, Ph.D., B.Sc. (Lond.), F.R.S., and Mrs. Frankland (Longmans, Green and Co.); 'Handbook of British Hepaticæ,' by Dr. M. C. Cooke, and 'The Flowering Plants of Western India,' by the Rev. A. K. Nairne (W. H. Allen and Co.); 'The Fauna of the Deep Sea,' by Sydney J. Hickson (Kegan Paul and Co.); 'British Fungus Flora,' Vol. iii., by G. Massee (George Bell and Sons); 'Investigations in Microscopic Foams and on Protoplasm,' by Professor O. Bütschli, translated by E. A. Minchin and illustrated (A. and C. Black); 'Students' Introductory Handbook of Systematic Botany,' by J. W. Oliver (Blackie and Son); 'Organic Chemistry,' by Professor Perkin (W. and R. Chambers); 'A Pocket Flora of the Edinburgh District,' by C. O. Sonntag (Williams and Norgate); and 'Elements of Physiology,' by Professor Walker Overend (J. Hughes and Co.).

### CHEMICAL ANALYSIS AND POISONERS.

In the *Forum* for the current month an article is devoted to a consideration of the question, "Can chemical analysis convict poisoners?" and others arising out of it, such as "Is an ingenious poisoner really safe from detection? Can he neutralise the symptoms of one poison by administering a second poison simultaneously? Can he poison so secretly, with such insidious refinement of method, or by such minute doses, as to baffle the most searching analysis? Is it therefore unsafe to convict a suspected criminal on merely scientific testimony? Or has science such tests and appliances that its detection of the minutest trace of poison in the dead tissue of a victim's body is certain, infallible, and conclusive, no matter what skill or craft may have been employed to thwart it?" After a necessarily brief but interesting explanation of the difficulties involved in such investigations and of the methods employed by chemists, accompanied by the details of several notorious poisoning cases, the writer sums up the whole subject by expressing the opinion that "there is no poison to which the public has access that cannot be detected."

### COMMISSION OF THE PEACE.

Mr. Owen I. Jones, Chemist, Llanrwst, an associate of the Pharmaceutical Society and local secretary for Llanrwst, has been appointed a Justice of the Peace for the County of Denbigh. Mr. James Watt, pharmaceutical chemist, Haddington, formerly a Member of Council of the Pharmaceutical Society, has been similarly honoured, being placed on the Commission of the Peace for

### NORTH BRITISH BRANCH.

The inaugural sessional address in connection with the evening meetings held by the North British Branch of the Pharmaceutical Society will be delivered by Professor J. T. Cash, M.D., F.R.S., Professor of Materia Medica in the University of Aberdeen. The date of the meeting is not yet fixed, but it will be held at the Society's House, 36, York Place, Edinburgh, probably about the middle of November.

### POISONING BY PYRIDINE.

In the *British Medical Journal* of last week is reported a fatal case of pyridine poisoning. A man employed at some tar works had filled a cask too full of the commercial pyridine, and, in order to reduce the amount, inserted one end of a bent iron tube, by means of which he proposed to syphon it off. In order to start the syphon he applied his mouth to the free end of the tube, and, unfortunately, swallowed a quantity of the liquid. Death ensued, at the district hospital, West Bromwich, forty-three hours after the accident.

### AUSTRIAN PHARMACEUTICAL ASSOCIATION.

The thirteenth ordinary meeting of this Association was held in Vienna on Wednesday, October 18, and the two following days, under the presidency of Dr. Al. Hellman, simultaneously with the meeting of Masters in Pharmacy who obtained their degree in the University of Vienna before 1863 and 1868. A reception was held at the Kaiserhof on Wednesday, and sittings of the Association were held in the Academy of Science on the subsequent days. The social element appears to have received a conspicuous share of attention, though a comparatively lengthy business programme was also got through.

### PHARMACEUTICAL SOCIETIES IN RUSSIA.

The *Lancet* notes that the Pharmaceutical Society of St. Petersburg celebrated the seventy-fifth year of its existence the week before last. The Society is the oldest of the kind in Russia, with the exception of the Pharmaceutico-Chemical Society of Riga, which was founded in 1802. The St. Petersburg Society consists of 75 honorary, 160 ordinary, and 50 corresponding members. It publishes a journal of its own, the *Pharmaceutische Zeitschrift für Russland*, which is printed in both the Russian and German languages. Eight other towns in Russia possess pharmaceutical societies—namely, Moscow, Warsaw, Dorpat, Kazan, Kief, Odessa, Kharkof, and Mittau.

### KEW BULLETIN.

The September number of this publication, just issued, deals with the flora of St. Vincent and adjacent islets. It contains an enumeration, occupying fifty-nine pages, of all specimens in the Kew Herbarium professing to be derived from St. Vincent, whether indigenous or naturalised. The largest proportion of the plants included in the catalogue were collected by Mr. Herbert H. Smith and his assistant, Mr. George W. Smith, and the total number of species of flowering plants collected in St. Vincent and the four adjacent islets, Bequia, Cannonan, Mustique, and Union, is about 1150. Several of the species have not been found else-

# Transactions of the Pharmaceutical Society.

## DONATIONS.

(*Concluded from page* 311.)

*To the Museum in London.*

**Mr. E. H. Gane, London:**
Fresh specimens of the Manchineel fruit, *Hippomane Mancinella*, L.

**Messrs. Evans, Lescher, and Webb, London:**
Specimens of false Ipecacuanha root (*Richardsonia* sp.), and of the dried leaves of *Datura Tatula*.

**Messrs. G. N. Souratty and Co., London:**
Specimen of the galls of *Tamarix articulata.*

**Mr. L. Wray, Perak (Corresponding Member):**
Specimen of the roots of *Prual*, *Ipoh lampong* and *Ipoh aker*, Biah leaves, and Plang oil.

**Professor H. G. Greenish, London:**
Eight commercial varieties of cochineal.

*To the Herbarium in London.*

**Dr. Geo. Watt, C.I.E., Hooghly College, Bengal:**
600 specimens of East Indian medicinal plants.

**Professor H. H. Rusby, New York:**
Eighteen specimens of Bolivian medicinal plants.

**Mr. L. Wray, Perak (Corresponding Member):**
Specimen of the plant yielding Plang oil.

**Mr. R. Nevins, Hildenborough:**
Eight specimens of *Strophanthus* from Lagos.

**Mr. J. W. White, Clifton, Bristol:**
Ten specimens of British plants.

## EXAMINATIONS IN EDINBURGH.

*October*, 1893.

Present—Messrs. Boa, Dott, Gibson, Jack, Kinninmont, Maben, Nesbit and Stephenson.

Professor Sir Douglas Maclagan was present on behalf of the Privy Council.

### MAJOR EXAMINATION.

*Four* candidates were examined. *Two* failed. The undermentioned *two* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

| | |
|---|---|
| Helsby, Fred | Sheffield. |
| Low, Robert | Arbroath. |

### MINOR EXAMINATION.

*Eighty-six* candidates were examined. *Forty-six* failed. The undermentioned *forty* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Abel, John Roughead | Forfar. |
| Agar, Ralph | West Hartlepool. |
| Barr, Alexander Steen | Liverpool. |
| Bruce, William | Larkhall. |
| Cooper, George | Glasgow. |
| Dawson, John Harper | Fife-Keith. |
| Fletcher, William Henry | Spilsby. |
| Gardner, Charles Albert | Sheffield. |
| George, John Arthur | Sheffield. |
| Golightly, Alfred Welch | Sunderland. |
| Goodman, Cornall | Halifax. |
| Greig, William Sinclair | Arbroath. |
| Harrison, William Killey | Peel Causeway. |
| Ingham, James | Cleckheaton. |
| Kaberry, William Todd | Faversham. |
| Kershaw, James | Rochdale. |
| Kirk, John | Alloa. |
| Lawson, Robert Murray | Dumfries. |
| Leslie, Robert | Rothienorman. |
| Lucas, Isaac | Southampton. |
| Macfarlane, Malcolm | Aberfeldy. |
| Monks, Robert Taylor | Radcliffe. |
| Moon, Charles | Ilfracombe. |
| Osmond, Charles Holdway | Liverpool. |
| Pilsbury, William | Eccleshall. |
| Quénet, George Alfred | North Shields. |
| Reed, John William | St. Helens. |
| Richardson, David Bee | Edinburgh. |
| Richardson, William | Liverpool. |
| Robinson, William Samuel | Barrow-in-Furness. |
| Roper, Albert Charles | Norwich. |
| Sclater, John George | Edinburgh. |
| Scott, Thomas Lamb | Hetton-le-Hole. |
| Stead, Samuel Blower | Widnes. |
| Stewart, Peter Alexander | Hamilton. |
| Taylor, John Henry | Newcastle-on-Tyne. |
| Tytler, Wiliam Wallace | Arbroath. |
| Urquhart, Robert | Aberdeen. |
| Williams, George Frederick | Tregarth. |

### MODIFIED EXAMINATION.

*One* candidate was examined, and was declared qualified to be registered as a Chemist and Druggist:—

| | |
|---|---|
| Robinson, Thomas | Darlington. |

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

A musical and social evening was held at 103, Great Russell Street, on Thursday, October 12, the chair being taken at 9 p.m. by Mr. W. Martindale, and an enjoyable evening was spent. The programme was arranged by Mr. H. H. Robins, and the artistes were Messrs. H. Pearsall (accompanyist), G. F. Green, C. W. Baldwin, H. Martindale, Harold Lane, A. J. Johnston, S. W. Murley, Sydney Jamieson, and W. Chapman.

The proceeds from the sale of programmes was given to the Benevolent Fund.

# Provincial Transactions.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The inauguration of the ninth session of the School of Pharmacy, held in connection with the Sheffield Pharmaceutical and Chemical Society, took place on Thursday, Oct. 12, in the Lecture Hall, Surrey Street. Mr. G. T. W. Newsholme presided, and was supported by Councillor J. Harrison, J.P., of Sunderland, whom the Council had been fortunate enough to secure to deliver the inaugural address. There was an excellent attendance, including the Rev. T. S. King, Messrs. H. Kemp (Manchester), W. Ward, G. A. Grierson (York), J. F. Eardley, R. Watts, A. Russell Fox, G. Ellinor, C. O. Morrison, G. T. Packer, and J. Newton Coombe.

The Secretary read letters of apology from Dr. Paul (Editor of *Pharmaceutical Journal*), Mr. W. Favell, Mr. R. Favell, Dr. Martin, and Dr. Porter.

In his opening remarks the Chairman thanked the members of the Society for having re-elected him after eight years' absence from the presidential chair. The object of their meeting that evening was to further the good work the Society was doing. Their desire was to get hold of the apprentices, the younger members of the Society, and to encourage them to join the school during the early years of their service. They were undoubtedly doing the right thing in getting their apprentices to join the school at this period of their life.

till the completion of their apprenticeship, and then getting through their examinations by three months' study at some school set apart for the purpose. He had with much pleasure read the address of Dr. Lauder Brunton delivered recently before the Pharmaceutical Society in London. Dr. Brunton said knowledge slowly obtained was lasting, and knowledge, or so-called knowledge, crammed, might serve its purpose for an examination, but six weeks later it was completely lost. He was desirous of pointing out a few of the successes achieved by students of the school. The student who last year took the President's prize had passed both the Minor and Major examinations in pharmacy, and another student had also passed his Major examination of the Pharmaceutical Society. He was pleased to say that the Society had been well supported by the chemists of the city, although he was afraid there were too many who gave only passive and not active support. What they wanted was not so much the money of their members as that they should take a personal interest in the Society and lay the benefits it conferred on them before their apprentices, who had no knowledge of what was being done on their behalf.

The annual report of the school, read by the secretary, Mr. C. O. Morrison, showed that at the opening of last session twenty-two names were entered as students, the number of entries in the various classes being: botany, 10; materia medica, 7; chemistry, 9; practical chemistry, 9—a total of 35. The average attendance throughout the session was 83 per cent., a goodly percentage, showing the high appreciation the pharmaceutical apprentices of Sheffield had for the efforts that were made for their scientific education. The progress in class work had been in every way satisfactory. The prize winners were as follows:—

**Botany**: 1st Prize, E. C. Exell.
„ Lecturer's Prize: W. Symons.
**Materia Medica**: 1st Prize, G. W. Rodgers.
„ „ Lecturer's Prize: S. Peat.
**Chemistry**: 1st Prize, W. H. Mallaband.
„ Lecturer's Prize: W. E. Pigott.
**Chemistry (Practical)**: 1st Prize, S. Peat.
„ „ Lecturer's Prize: W. Symons.
**President's Prize (for all subjects)**: W. H. Mallaband.

The prizes having been distributed, Mr. J. Harrison, J.P. (Sunderland), delivered his address, which was reported in last week's issue (see page 315).

Mr. H. E. Ibbitt moved a vote of thanks to Mr. Harrison, referring in high terms to the encouraging and stimulating effect which such addresses had on young men just starting in life. An apprentice stood behind the counter a long time each day, and to him the pursuit of knowledge was no easy matter. To master even the elements of such sciences as botany and chemistry required great determination, and everything that could be done to facilitate the course of study to be gone through, members of the society should consider it their duty to do.

Mr. W. Ward seconded the resolution, and the Rev. T. S. King, speaking in support, said that he would be very glad to see the next morning a full report of Mr. Harrison's address in the columns of the morning papers, now taken up by betting, handicapping, and sporting news. Such an address was not only intended to inspire young men with high and lofty ideas as to the character of the profession into which they were entering, but would have an elevating and moral influence on the community of a great city like Sheffield. He hoped the time was not far distant when the words of wise men like Mr. Harrison would find a place in the public press, instead of the miserable trash which now found so much space in their daily journals.

The resolution was passed unanimously.

Mr. J. Harrison, in reply, said he . . . had long heard of the good work being done in Sheffield, how their Society had held together year after year, when in other towns societies had arisen, flourished and faded away. He was curious, but had now come and seen the excellent lines on which their association was conducted. They could meet for profitable discussion, for educational purposes, and for the purposes of amusement, and therefore fulfilled the whole side of their humanity. He wished them every success in their future efforts.

### The Annual Dinner.

In the evening the annual dinner of the Society was held in the Masonic Hall, Surrey Street, where a party of some 80 members and guests was entertained. Mr. G. T. W. Newsholme, President, occupied the chair. Among the principal guests were Mr. J. Harrison, Dr. Cleaver, Messrs. H. Kemp, J. Newton-Coombe, A. H. Allen, C. Atkin, F.R.C.S., J. Hall Worrall, and B. W. Winder.

The menu, which had been specially designed for the occasion by Mr. Ed. Rodgers, was a humorous and clever caricature of the trade. The illustrations being local caused considerable amusement.

The usual loyal toast having been honoured, Mr. Harry Kemp, of Manchester, proposed the health of the "Sheffield Pharmaceutical and Chemical Society." He had, he remarked, great belief in the power of these local societies, and was convinced that they did a great amount of good in a trade like theirs. He had been much delighted with what he had seen that day concerning the Sheffield association. He could not say much of the Manchester organisation. Certainly it was not as powerful and representative as it might be. They made progress, added every month to their numbers, and hoped soon to become a greater influence in the trade. He was pleased to see in Sheffield the educational and social elements so happily united. He believed that by strongly working at the educational they were only catering for a certain part of the body. There was a limit to the amount of education one could take in after he had got past the absolutely essential quantity. By catering for that other and social side they were doing a great deal to bring about a better feeling and understanding between the members of the trade. He was delighted to see so many of the pharmacists of the district collected together, bent on hearty enjoyment.

The President, in responding, said he was greatly obliged to Mr. Kemp for the kind manner in which he had referred to Sheffield and Sheffield pharmacists. Mr. Kemp had occupied a very prominent position in past years with regard to pharmaceutical politics. He, with others, had tried to arouse a better feeling among the chemists of this country, and had inaugurated a scheme for the amalgamation of the different pharmaceutical bodies. This was a very noble thing, and he was quite sure the chemists in provincial associations would benefit by such amalgamation. He wished again to thank the chemists of Sheffield for placing him in the presidential chair of their Society. It had been his utmost endeavour ever since—fifteen years ago—he became connected with the Society to press on the members the importance of having a better system of educating their younger members. This had always been the first thing in the minds of the Council. It was a grand thing to educate men to carry out the duties of a business like theirs in a proper manner. It was for the safety of the public that they should be sufficiently well educated, and it was for the trade to show that they were capable of carrying out the duties imposed by the Pharmacy Act. They were placed in a responsible position to protect the public. It was not their duty to combine together to charge higher prices for medibeyond the prices of the ordinary tradesman, for the single fact that they had to be educated to carry on their business in such a way that the public would be properly protected. On behalf of the Society he thanked them for the toast.

Mr. A. R. Fox proposed "The Pharmaceutical Society of Great Britain," remarking that in respect to that Society he must take up a twofold position: first find fault and afterwards eulogise. He had a great admiration for the Society and the work it had done for the trade. They had no absolute knowledge of the difficulties which beset the Pharmaceutical Council in their deliberations, and consequently sometimes found fault when they had not much reason for so doing. They had, however, several pressing grievances, some connected with limited companies and some with companies which were unlimited—limited only sometimes to the amount of shares held by one person. They heard only the previous week of a limited company with six members. Five of these held one share each, and the other man held the odd 5995 shares in his own name. He was the manager of the concern, and an unqualified man. Yet he was allowed to carry on the business and to do everything that was possible and legal for a chemist who had undergone the severe curriculum and severe examination that their students had to undergo. This he thought was a grievance which should be remedied by the gentlemen who sat on the Council of the Pharmaceutical Society of Great Britain. The matter had no doubt been under discussion in the Council, and he sincerely hoped some early action would be taken. The Society was an educational one. They had given to them by legislature certain powers relating to examinations and restrictions, and they should do their best to make these powers effective.

Mr. Harrison, in responding to the toast, said that Mr. Fox had raised a most important question, a question that had engaged, and would engage, the attention of the Pharmaceutical Council. It was a question fraught with great difficulties. He had his own solution of the difficulty, but stood in the distinguished position of being in a very small minority on the Council in the views he held. This company question would have to be faced sooner or later, and the sooner the better. What was the effect of the present state of affairs? A young man presented himself once or twice and failed to satisfy the examiner. He found it was useless or hopeless to attempt any longer to get through the examination, and he took to himself five other spirits more ignorant than himself and called himself a limited company. There must be a remedy found for such an anomalous state of things, and there would be one found at no distant day. The difficulty in dealing with this matter was the want of interest shown by pharmacists themselves. They were told the Council of the Pharmaceutical Society did not represent the pharmacists of the country, and that its position was not what it ought to be. The constitution of the Society was one of the most democratic that could possibly be imagined. Every man who was a member of the trade and chose to pay the fee could become a member of the Society and exercise every right of a member. Yet only about one-fourth of those on the roll of chemists and druggists thought it worth while to join. He said that the man who refused to become a member and exercise the right of his vote had no right to find fault with the Society if it did not do what he thought it should do. Let every man who practised pharmacy become a member of the Society, let him, when the elections came round each year, exercise his vote, and then they would be able to take some decisive action on this and other grave questions. Only one-fourth of their number were on the roll of the Society, and the Society did not represent the trade, but the high-class pharmacists of the West-end of London. Never was a more fallacious statement made. But even if it did represent these people, then it represented pharmacy in its highest aspects, and would not they desire that it should do so? Surely the higher covered the lower, the greater included the less, and if they represented all that was best in pharmacy they represented all that was below. Under any circumstances he would point out that two-thirds of the Council of the Society retired each year, and that no member of the Council could stay on more than two years without seeking re-election, so that in two years they could change the whole Council. Surely these complaints came with ill grace from people who would not take the trouble to adopt the comparatively easy course open to them. He did not fear to say that evening that the present Council of the Society did its best for the trade at large. There were no interests that occupied the time of the Council of the Society more than trade interests. If members of the trade were aroused to a better sense of their duty, if they would join the Society and exercise their votes year by year, then the Society would be exactly what they wanted it to be, and would be compelled to do the necessary work. So long as it was in the present divided state, it was helpless to go to Parliament and promote any Bill. If they did send up a Bill what would be the reply? They would be told they did not represent the pharmacists of Great Britain, and the Government would have nothing to do with it. If pharmacists were only determined and would join the Society in round numbers, this state of affairs could be remedied in one single session of Parliament. He did not desire them to go to Parliament merely to protect their own interests. The interest which he would protect, and which was bound up in their own, was that of the great mass of the people of this country. They were charged with responsible duties which devolved on them, and the pharmacists of Great Britain ought to be men who had proved the possession of qualifications for the work, and no other persons should be allowed to practise. There was another question which he felt very deeply upon, and that was the benevolence which the Council of the Society were called upon to exercise. In 1860 a sum of £490 was distributed in relief by the Council. Last year it had risen to £1627, and if they were to carry on the work properly they must have at least another £500. Finally, he would say that the Society, if properly supported, was perfectly able to do all the work that any reasonable man could expect it to do, and its future rested on the action of the pharmacists of the country. It was useless to complain of the action of a society which was crippled on every hand simply and solely because members would not join its ranks as they ought to do. The resources at present at their disposal were comparatively weak, but all could be done if only they had, as existed in Sheffield, a firm, united, and enthusiastic body of members.

Mr. Morrison proposed the toast of "The Medical Profession," touching briefly on the inadvisability of doctors dispensing their own medicine and prescribing "quack" medicines, a practice which was growing to an alarming extent in some parts of the country.

Dr. Cleaver and Mr. C. Atkin, F.R.C.S., responded, claiming for Sheffield an immunity from either of these practices.

The health of "The Scientific and Learned Societies" was given by Mr. Geo. Ellinor, who spoke highly of the good work done by the Microscopical Society of Sheffield.

Mr. Newton Coombe, in reply, said it was to outsiders an extraordinary thing to note how seldom one saw or heard of any mistake being made by phar-

Mr. A. H. Allen, City Analyst, also responded.

The other toasts included "The Press," "The President and Council," and the "Visitors."

The humorous and musical portions of the programme were contributed by Messrs. A. H. Allen, R. Watts, J. A. Rodgers, Albert Riden, A. N. Tucker. and A. Dawes.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

A general meeting of this Association was held on Thursday, the 12th inst., to inaugurate the coming session. The President (Mr. Alderman Deck) occupied the chair, and there were present Mr. W. Elborne, B.A. (Vice-President), Mr. C. S. Addison (Hon. Treas.), Mr. E. S. Peck (Hon. Sec.), and a good number of members.

The Chairman said they would all join with him in deploring the resignation of their Secretary, Mr. Peck, who had worked so hard and done so much to put the Association on a firm footing.

Mr. Peck said he was resigning his post not from lack of interest in the work, but solely because he had not time to devote to the duties. He had much pleasure in proposing Mr. Addison as Secretary to the Association.

Mr. R. M. Stearn seconded, and Mr. Addison was unanimously elected as Secretary in place of Mr. Peck, resigned.

The President in his inaugural speech said he had to thank them very heartily for having elected him to the presidential chair. He reviewed the work of the Association with great satisfaction, and had found its meetings a means of his knowing the other members of the trade in the town better, and he hoped they had as good an opinion of him as he had formed of them. He could but feel gratified to see the young members of the trade coming forward and taking an interest in the work of the Association, which could not fail to be of great service to them all. The members were urged to utilise every opportunity to attend the scientific and technical lectures which are being, and will be, held in the town during the coming session. In conclusion, the opinion was expressed that the apprentices in Cambridge had facilities for becoming efficient in the trade such as very few other towns had, except, perhaps, the sister university town.

A vote of thanks to the Chairman closed the proceedings.

## MANCHESTER PHARMACEUTICAL ASSOCIATION.

The annual general meeting of this Association was held at the Chemical Club, Victoria Hotel, on Wednesday, October 11, and was essentially a meeting for the transaction of business relating to the Association. The chair was taken by Mr. G. S. Woolley, who referred to the satisfactory progress the Association was making, and he urged the members by individual effort to still further improve the local organisation. The financial statement and the report of the last year's proceedings were read and passed. An open competition had been held, the prizes being collections of herbaria given by Mr. William Stones. Out of seven competitors, the three following secured prizes. Senior—J. R. Bransby. Junior—H. L. Young and E. Jones. The following were elected at this meeting, and constitute the Council of the Association for the present session:—Messrs. Arrandale, Benger, Bowden, Kemp, Kirkby, Lane, Stones, Westmacott, Wilkinson, Woolley, Young, and Blackburn.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The annual general meeting of the above Society was held on the 12th inst., at the University College, Brownlow Hill, when the following gentlemen were elected office-bearers for the session:—Messrs. Frank Walker, President; R. C. Cowley, Ph.C., and T. H. Wardleworth, Vice-Presidents; George Brinson, Treasurer; R. H. Mitchell, 13, Tithebarn Street, Secretary; and J. R. Burn, A. H. Jones, G. Lee, J. Park, C. F. Symes, Ph.C., Fred Walker, J. J. Wilson, T. S. Wokes, Ph.C., and H. Wyatt, jun., Ph.C., members of Council. An attractive programme has been arranged for the session, including lectures by Dr. J. B. Nevins on "Fifty Years of Pharmacy," and Dr. J. R. Logan on "Evolution." Professor R. J. Harvey Gibson will inaugurate the session on November 2 by a lecture on "Recent Researches in Fungology."

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

This Association resumed its winter meetings on Thursday, Oct. 12. The President, Mr. W. L. Currie, intimated letters of apology for absence from Dr. W. McLennan, Messrs. Laidlaw Ewing, J. W. Sutherland, and D. Storrar; from the latter the Secretary had received a letter wishing continued success to the Association. After some other preliminary business, the President delivered his opening address as follows:—

### INAUGURAL ADDRESS.

BY W. L. CURRIE.

Before proceeding to the subject I have chosen for my remarks to-night, I would just remind you that we inaugurate this evening the real existence of the "Glasgow and West of Scotland Pharmaceutical Association," and my first duty is to thank you, gentlemen, most heartily for having elected me to the very honourable position of President—I should say first President—of the intended Association, and to assure you that whatever services may be required at my hands will be rendered ungrudgingly, and if my best efforts should fall short of the standard of perfection I hope you will bear with the shortcomings.

During the course of last session it was forced upon the Council of the Glasgow Association that if they could embrace the district surrounding Glasgow, and the wide area of the South and West of Scotland, such an extension would be desirable, and after due deliberation it was decided to make the attempt. The result was quite satisfactory, a great number of chemists in the area referred to promising their support and membership, and while the duties and responsibilities will be much heavier, I have no doubt that by means of the extended Association we may do much to uphold the dignity of the profession to which we belong, to cultivate that friendly feeling which should exist among those of the same calling, and as a consequence have an association representative of the legitimate drug trade in Glasgow and the West of Scotland. There can be no doubt that much will be expected from an Association having such a comprehensive title, and it rests entirely with the members as to what impressions are to be conveyed to the pharmaceutical world. I may be allowed to say, much we can do. It remains for you to say, much we will do. The success of our Association does not depend so much upon its President as upon the manner in which he is supported by its members, and I must trust to your united and individual efforts to make the coming session as successful and memorable as the session of 1892-93.

In looking about for a subject which might form a suitable theme for an opening night, I found considerable difficulty. But after a little consideration I elected to enlarge upon the "objects" for which the Association has its existence, and that particularly so in view of current events.

What are the objects of the Association? Accord ing to rule 2, which you will find printed on the syllabus, it reads thus: "To promote the educational and trade interests of pharmacy, and to cultivate friendly intercourse among the members." A very comprehensive scheme, and one which we can reasonably expect to carry out.

I do not know that it was wise to include education as one of the objects for which the Association was formed. While admitting the absolute necessity for it, I think it should have been a secondary, not a primary, object. We, as an Association, cannot engage in teaching, but will do all we can to arrange for its being successfully carried out.

Private and public schools and colleges exist in such great numbers that the young pharmacist has every opportunity for making rapid and satisfactory progress towards the goal of his hopes. In fact, any youth who, on leaving school, possesses the leaving certificate, passes the Preliminary examination or its equivalent, and becomes apprenticed to a chemist and druggist — and I strongly support the recommendation that no youth be taken as an apprentice till the Preliminary is passed—should, by attending the courses of lectures provided by many of the schools for the subjects necessary, be able to successfully pass the qualifying examination by the time he reaches the required age and has conscientiously done his work. And in this connection I cannot do better than recommend those who have not done so to carefully read the inaugural address delivered by Dr. T. Lauder Brunton at the opening of the School of Pharmacy last week. It is full of material for thought and advice.

The second object is "trade interests." I suppose you are quite willing to admit that want of union among ourselves has been the great drawback to the successful carrying out of many of the schemes which have been from time to time attempted. I do not say that every "proposal" drafted by the President and Council of the Pharmaceutical Society should be accepted with open arms as if it were to be the panacea for all our ills. But this I do say, that if the counsels of "bear and forbear" had prevailed, more listening to reason than to selfishness, the policy of consolidation rather than disintegration adopted, our position as traders (I leave out the profession at present) would have been on a different footing.

It is asserted frequently that chemists are, as a body, blind to their own interests; they do not seem to be able to get above thinking about the contents of their till; they are narrow minded, taking no interest in passing events, Acts of Parliament, and the statutory obligations that are there. What is the use of bothering with them? They have to be obeyed and walked up to. What is the use of joining associations or societies? Why, that is the very essence of the necessity for the existence of local associations, and their main object should be the promotion of a feeling of good fellowship among the members of the trade, so that by friendly discussion and united action a clearer understanding on many points might be arrived at.

Chemists, as a rule, are men of more than ordinary intelligence (the nature of their business necessitates it), and why it is that at this time of day they do not see it will be to their own benefit to amalgamate and work together passes my comprehension.

How many other trades and professions exist throughout the country thoroughly organised, and exerting an influence—good or bad—which is seen and felt. I have on several occasions ventured to say that if the Pharmaceutical Council were supported by every qualified chemist and druggist, that body would be able to do almost anything they set themselves to do; and I have no hesitation in reiterating the statement. A great deal has been said regarding the non-success of various agencies having for their object the better protection of our trade interests.

Well, gentlemen, to what is the failure due? Simply this—no society or association which does not recognise the Pharmaceutical Society as the medium through which the grievances can be stated has any chance of success. The Pharmaceutical Society alone possesses the *locus standi* to approach Parliament, and it is well to recognise this fact.

At the recent Conference meeting at Nottingham, a meeting was held to discuss the advisability of forming a Federation of Chemists and Druggists through Associations. That meeting was a complete success. There was a large and representative gathering, and the speakers were at one as to the necessity for the existence of such a body, and it was unanimously agreed that arrangements be made for the formation of the Federation.

It seems to me that such a society, composed, as it is intended to be, of representatives from every Association throughout the country, should be able to do something, if it is supported, and it is expected that before the end of this session the proposed Federation will be an accomplished fact and in working order.

And regarding the discussion of trade matters great good can be obtained by bringing forward such questions as often as practicable, and this is a subject which appeals to every member. If you do not care to bring any point forward yourself, get someone to do it for you. Everything of interest should be discussed, and in these days of pharmacy and Revenue prosecutions, it does not do to be dubious on any point.

The question of election to the Pharmaceutical Council should be discussed by our Association, and endeavours should be made to secure the return of those who are thoroughly in touch with the retail trade, and have the best interests of pharmacy at heart.

The third object is "to cultivate friendly intercourse among its members."

The carrying out of this object has, I am sure, been the source of much pleasure to those who attended the meetings during last session. It is not a desirable thing to shut ourselves up in the pharmaceutical sanctum, or to make the one object of our life that of making money. There are better things in the world than wealth.

> "Ay, there are some good things in life
> That fall not away with the rest,
> And of all good things upon earth
> I hold that a faithful friend is the best."
>
> —*Meredith.*

Increase of trade is all right, but we want something else, something that will satisfy our desire for a more fit and pleasing form of social life. We must humanise with each other. Man is essentially a social animal, and no better form of enjoyment can be had after a day's hard work than to come down to our meetings to have a change of scene and companionship. "All work and no play" is a maxim to be carefully observed. Life is too short to adopt all work as its principle, because man would then become a mere machine fit to do only one thing. Some relaxation is necessary, if it were for nothing else than to oil the machinery. Why should we not be privileged to enjoy a social evening, now and then, to cast aside the business cloak, and meet on terms of friendship?

I am bound to say that at meetings such as these we get to know each other better, old scores are wiped out, old associations are renewed, and friendships formed sufficiently strong to last through life, while we find out that the man whom we considered a crusty curmudgeon is a jolly good fellow after all.

I cannot allow the opportunity afforded me for these remarks to pass without referring to a subject which is perennial to Glasgow, viz., medical halls and surgeries.

As far back as 1873 the Glasgow Chemists' and Druggists' Association gave a complimentary dinner to the President, Vice-President, and Secretary of the Pharmaceutical Society, and in welcoming the deputation to Glasgow on the occasion of their first official visit, the President (Mr. Davison) commented on the desirability of the officers of the Society visiting their constituents as such, in order to give them verbally, and thus more accurately, an account of what had been done in high places. Twenty years after we are endeavouring to have the same principle carried out.

And in regard to the question of surgeries and medical halls, Mr. Davison made two statements, which, singularly enough, are exactly what at the present moment is exercising the mind of the pharmaceutical world so much.

"1. That the true interests of the medical profession, as well as those of pharmacists and the general public, demand that the duties of prescriber and dispenser be, as far as possible, separated.

"2. That when physicians and surgeons really find it necessary to keep open shop, they should at least be required to have a qualified dispenser."

Statements which at the present time should be intensified tenfold.

The honesty and desirability of the first statement is too self-evident to necessitate any remarks from me, while as to the second point, I can hardly find language sufficiently expressive to enlarge upon it.

The curious idea that a medical man should be outside the provisions of the Pharmacy Act as regards the keeping open shop for supplying the public is such a glaring absurdity, that I am surprised the powers that be have been so long dormant.

The Act was passed ostensibly with the object of protecting the public, and of giving them a certain amount of guarantee that medicines, and particularly those containing poisons, would be properly dispensed; hence the necessity for the qualification by examination. Does it not seem strange that such provisions should be meant for chemists only, who generally look after their business personally, while the medical man who owns a surgery should (in the great majority of cases) have the privilege accorded him of conducting his shop by mere boys (and sometimes girls) who are quite ignorant of the nature of the drugs they handle.

If such is to be the case, the Pharmacy Act of 1868 is a farce. There would be no necessity for it at all. Under such conditions anyone could open shop, and by getting a medical man to allow his name to appear in connection with the shop, carry on the business of a chemist and druggist. This is not as it should be, for while medical men have a perfect right to dispense or supply medicines of all kinds to their own patients or the public if done by themselves, they have no legitimate right to keep open surgeries for general retail purposes, unless such premises are under the charge of a qualified man.

But is it necessary in Glasgow, the second city of the empire, that medical men should undertake dispensing?

I can understand it in some out of the way district, where a medical man is a necessity and would not support a chemist, but, where there are capable and qualified men to do the work, there can be no reasonable excuse for preserving the relics of an age long past. If the Pharmacy Act is to be of any benefit at all to qualified chemists, the Pharmaceutical Society has a splendid opportunity of proving it here in our midst.

Before sitting down allow me to draw your attention to the arrangements made by your Council for the coming session. The same course has been adopted as that of last year. There will be a lecture on the first meeting night of each month, and for these most attractive subjects have been chosen while the names of the gentlemen who have so generously consented to give them are quite sufficient guarantee as to their quality. The intervening nights will be devoted to the discussion of trade matters, and as several points in connection therewith want clearing up badly, such discussions should prove highly interesting. All that is wanted to make the coming session a success is a large accession of members and interest in the meetings.

I have no desire to be considered sermonising; but when I say that this Association can be made a power to be felt, I mean it. Every office-bearer should make it a point to button-hole every brother-in-trade he can lay hands on, and persuade him to join our ranks, if he has not already done so, and every individual member, if he has the welfare of his profession and the Association at heart, should he chance to be in any part of the district now included under the title Glasgow and West of Scotland where there is a chemist, call upon him and lay before him the claims of the Association. If such were done we would soon have a membership which, in voting power, might have a most beneficial influence towards moulding any action which might be taken to improve the position of the trade. It can be done; let us try and accomplish it.

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The President then said that Dr. McLennan, who was kept away from the meeting by professional duties, had sent him a long letter, in which he said that his attitude and the attitude, he was sure, of most members of his profession might be understood from the few ideas he was going to write in this letter. "Everyone admits that the training of a pharmacist occupies quite a number of years, and even at the end of a long apprenticeship many things are only to be learned by prolonged and accumulated experience. Many dispensers never attain great excellence, partly on account of a natural inaptitude, but also, I believe, to the detrimental modern tendency of physicians to prescribe proprietary articles. If your Society, by a united effort, could accomplish the abolition of the stamp duty on patent and proprietary medicines, a great boon would, in all probability, accrue to the chemists themselves and also to the medical profession. The training a medical man gets in this department is, even at the best, necessarily limited. Most unfortunately, too, I think, the new regulations recently passed by the Scottish University Commissioners are cutting down the instruction in practical pharmacy from fifty to twenty-five demonstrations. If the action of the Commissioners can be taken as an indication of the mind of the General Medical Council on the subject, it appears to me that the next regulation which should come into force would be the restriction to pharmacists of dispensing."

A hearty vote of thanks was accorded to the President for his address, and subsequently a number of new members joined the Association, while the President announced, with much regret, that they were about to lose Mr. Findlay, whose services as Treasurer have been of great value to the Association.

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# The British Association for the Advancement of Science.

## ADDRESS TO THE BIOLOGICAL SECTION.

BY REV. H. B. TRISTRAM, M.A., LL.D., D.D., F.R.S.,
PRESIDENT OF THE SECTION.

It is difficult for the mind to grasp the advance in biological science (I use the term biology in its wide etymological, not its recently restricted, sense) which has taken place since I first attended the meetings of the British Association, some forty years ago. In those days, the now familiar expressions of "natural selection," "isolation," "the struggle for existence," "the survival of the fittest," were unheard of and unknown, though many an observer was busied in culling the facts which were being poured into the lap of the philosopher who should mould the first great epoch in natural science since the days of Linnæus.

It is to the importance and value of field observation that I would venture in the first place to direct your attention.

My predecessors in this chair have been, of recent years, distinguished men who have searched deeply into the abstrusest mysteries of physiology. Thither I do not presume to follow them. I rather come before you as a survivor of the old-world naturalist, as one whose researches have been, not in the laboratory or with the microscope, but on the wide desert, the mountain side, and the isles of the sea.

This year is the centenary of the death of Gilbert White, whom we may look upon as the father of field naturalists. It is true that Sir T. Browne, Willughby, and Ray had each, in the middle of the seventeenth century, committed various observations to print; but though Willughby, at least, recognised the importance of the soft parts in affording a key to classification, as well as the osteology, as may be seen from his observation of the peculiar formations, in the Divers (*Colymbidæ*) of the tibia, with its prolonged procnemial process, of which he has given a figure, or his description of the elongation of the posterior branches of the woodpecker's tongue, as well as by his careful description of the intestines of all specimens which came under his notice in the flesh, none of these systematically noted the habits of birds, apart from an occasional mention of their nidification, and very rarely do they even describe the eggs. But White was the first observer to recognise how much may be learnt from the life habits of birds. He is generally content with recording his observations, leaving to others to speculate. Fond of Virgilian quotations (he was a fellow of Oriel of the last century), his quotations are often made with a view to prove the scrupulous accuracy of the Roman poet, as tested by his (White's) own observations.

In an age, incredulous as to that which appears to break the uniformity of nature, but quick to recognise all the phenomena of life, a contrast arises before the mind's eye between the abiding strength of the objective method, which brings Gilbert White in touch with the great writers whose works are for all time, and the transient feebleness of the modern introspective philosophies, vexed with the problems of psychology. The modern psychologist propounds his theory of man and the universe, and we read him, and go on our way, and straightway forget. Herodotus and Thucydides tell a plain tale in plain language, or the Curate of Selborne shows us the hawk on the wing, or the snake in the grass, as he saw them day by day, and, somehow, the simple story lives and moves him who reads it long after the subtleties of this or that philosophical theory have had their day and passed into the limbo of oblivion. But, invaluable as has been the example of Gilbert White in teaching us how to observe, his field was a very narrow one, circumscribed for the most part by the boundaries of a single parish, and on the subject of geographical distribution (as we know it now) he could contribute nothing, a subject on which even the best explorers of that day were strangely inobservant and inexact. A century and a half ago, it had not come to be recognised that distribution is, along, of course, with morphology and physiology, a most important factor in determining the facts of biology. It is difficult to estimate what might have been gained in the case of many species, now irreparably lost, had Forster and the other companions of Captain Cook, to say nothing of many previous voyagers, had the slightest conception of the importance of noting the exact locality of each specimen they collected. They seem scarcely to have recognised the specific distinctions of the characteristic genera of the Pacific Islands at all, or, if they did, to have dismissed them with the remark, "On this island was found a flycatcher, a pigeon, or a parrot similar to those found in New Holland, but with white tail-feathers instead of black, an orange instead of a scarlet breast, or red shoulders instead of yellow." As we turn over the pages of Latham or Shaw, how often do we find for locality one of the islands of the South Seas, and, even where the locality is given, subsequent research has proved it erroneous, as though the specimens had been subsequently ticketed; Le Vaillant described many of his South African birds from memory. Thus Latham, after describing very accurately *Rhipidura flabellifera*, from the south island of New Zealand, remarks, apparently on Forster's authority, that it is subject to variation; that in the island of Tanna another was met with, with a different tail, etc., and that there was another variety in the collection of Sir Joseph Banks. Endless perplexity has been caused by the *Psittacus pygmæus* of Gmelin (of which Latham's type is at Vienna) being stated in the inventory as from Botany Bay, by Latham from Otaheite, and in his book as inhabiting several of the islands of the South Seas, and now it proves to be the female *Psittacus palmarum* from the New Hebrides. These are but samples of the confusion caused by the inaccuracies of the old voyagers. Had there been in the first crew who landed on the Island of Bourbon, I will not say a naturalist, but even a simple-hearted Leguat, to tell the artless tale of what he saw, or had there been among the Portuguese discoverers of Mauritius one who could note and describe the habits of its birds with the accuracy with which a Poulton could record the ways and doings of our Lepidoptera, how vastly would our knowledge of a perished fauna have been enriched! It is only since we learned from Darwin and Wallace the power of isolation in the differentiation of species, that special attention has been paid to the peculiarities of insular forms. Here the field naturalist comes in as the helpful servant of the philosopher and the systematist, by illustrating the operation of isolation in the differentiation of species. I may take the typical examples of two groups of oceanic islands, differing as widely as possible in their position on the globe, the Sandwich Islands in the centre of the Pacific, thousands of miles from the nearest continent, and the Canaries, within sight of the African coast; but agreeing in this, that both are truly oceanic groups, of purely volcanic origin, the ocean depths close to the Canaries, and between the different islands, varying from 1500 to 2000 fathoms. In the one we may study the expiring relics of an avifauna completely differentiated by isolation; in the other we have the opportunity of tracing the incipient stages of the same process.

The Sandwich Islands have long been known as possessing an avifauna not surpassed in interesting peculiarity by that of New Zealand or Madagascar; in fact, it seems as though their vast distance from the continent had intensified the influences of isolation. There is scarcely a passerine bird in its indigenous fauna which can be referred to any genus known elsewhere. But, until the very recent researches of Mr. Scott Wilson, and the explorations of the Honourable W. Rothschild's collectors, it was not known that almost every island of the group possessed one or more representatives of each of these peculiar genera. Thus, every island which has been thoroughly explored, and in which any extent of the primeval forest remains, possesses, or has possessed, its own peculiar species of *Hemignathus*, *Himatione*, *Phæornis*, *Acrulocercus*, *Loxops*, *Drepanis*, as well as of the massive-beaked finches, which emulate the *Geospiza* of the Galapagos. Professor Newton has shown that while the greater number of these are, probably, of American origin, yet the South Pacific has contributed its quota to this museum of ornithological rarities, which Mr. Clarke very justly proposes to make a distinct biological sub-region.

That each of the islands of this group, however small, should possess a flora specifically distinct, suggests thoughts of the vast periods occupied in their differentiation.

In the Canary Islands, either because they are geologically more recent, or because of their proximity to the African coast, which has facilitated frequent immigrations from the continent, the process of differentiation is only partially accomplished. Yet there is scarcely a resident species which is not more or less modified, and this modification is yet further advanced in the westernmost islands than in those nearest to Africa. In Fuerteventura and Lanzarote, waterless and treeless, there is little change, and the fauna is almost identical with that of the neighbouring Sahara. There is a whin-chat, *Pratincola dacotiæ*, discovered by my companion, Mr. Meade-Waldo, peculiar to Fuerteventura, which may possibly be found on the opposite coast, though it has not yet been met with by any collectors there. Now, our whin-chat is a common winter visitant all down the West African coast, and it seems probable that isolation has produced the very marked characters of the Canaries form, while the continental individuals have been restrained from variation by their frequent association with their migratory relations. A similar cause may explain why the blackbird, an extremely common resident in all the Canary Islands, has not been modified in the least, since many migratory individuals of the same species sojourn every winter in the islands. Or take the blue titmouse. Our familiar resident is replaced along the coast of North Africa by a representative species, *Parus ultramarinus*, differentiated chiefly by a black instead of a blue cap, and a slate-coloured instead of a green back. The titmouse of Lanzarote and Fuerteventura is barely separable from that of Algeria, but is much smaller and paler, probably owing to scarcity of food and a dry desert climate. Passing, 100 miles further to sea, to Grand Canaria, we find in the woods and forests a bird in all respects similar to the Algerian in colour and dimensions, with one exception—the greater wing coverts of the Algerian are tipped with white, forming a broad bar when the wing is closed. This, present in the Fuerteventura form, is represented in the Canarian by the faintest white tips, and in the birds from the next islands, Teneriffe and Gomera, this is altogether absent. This form has been recognised as *Parus teneriffæ*. Proceeding to the north-west outermost island, Palma, we find a very distinct species, with different proportions, a longer tail, and white abdomen instead of yellow. In the Ultima Thule, Ferro, we find a second very distinct species, resembling that of Teneriffe in the absence of the wing bar and in all other respects, except that the back is green like the European, instead of slate as in all the other species. Thus we find in this group a uniform graduation of variation as we proceed further from the cradle of the race.

A similar series of modifications may be traced in the chaffinch (*Fringilla*), which has been in like manner derived from the North African *F. spodiogena*, and in which the extreme variation is to be found in the westernmost islands of Palma and Ferro. The willow wren (*Phylloscopus trochilus*), extremely numerous and *resident*, has entirely changed its habits, though not its plumage, and I have felt justified in distinguishing it as *Ph. fortunatus*. In note and habits it is entirely different from our bird, and though it builds a domed nest it is always near the top of lofty trees, most frequently in palm trees. The only external difference from our bird consists in its paler tarsi and more rounded wing, so that its power of flight is weaker, but, were it not for the marked difference in its habits and voice, I should have hesitated to differentiate it. In the kestrel and the great spotted woodpecker there are differences which suggest incipient species, while the forests of the wooded western islands yield two very peculiar pigeons, differing entirely from each other in their habits, both probably derived from our wood-pigeon, but even further removed from it than the *Columba trocaz* of Madeira, and, by their dark chestnut coloration, suggesting that peculiar food, in this case the berries of the tree laurel, has its full share in the differentiation of isolated forms. If we remember the variability of the pigments in the food of birds, and the amount absorbed and transferred to the skin and plumage, the variability in the tints and patterns of many animals can be more readily understood.

One other bird deserves notice, the *Caccabis*, or red-legged partridge, for here, and here alone, we have chronological data. The Spaniards introduced *Caccabis rufa* into Canaria, and *C. petrosa* into Teneriffe and Gomera, and they have never spread from their respective localities. Now, both species, after a residence of only 400 years, have become distinctly modified. *C. rufa* was introduced into the Azores also, and changed exactly in the same manner, so much so, that Mr. Godman, some years ago, would have described it as distinct, but that the only specimen he procured was in moult and mutilated, and his specimen proves identical with the Canarian bird. Besides minor differences, the back is one-fourth stouter and longer than in the European bird, and the tarsus very much stouter and longer, and the back is grey rather than russet. The grey back harmonises with the volcanic dark soil of the rocks of the Canaries, as the russet does with the clay of the plains of England and France. In the Canaries the bird lives under different conditions from those of Europe. It is on the mountain sides and among rocks that the stouter beak and stronger legs are indispensable to its vigorous existence. It is needless to go into the details of many other species. We have here the effect of changed conditions of life in 400 years. What may they not have been in 400 centuries? We have the result of peculiar food in the pigeons, and of isolation in all the cases I have mentioned. Such facts can only be supplied to the generaliser and the systematist through the accurate and minute observations of the field naturalist.

The character of the avifauna of the Comoro Islands, to take another insular group, seems to stand midway in the differentiating process between the Canaries and the Sandwich Islands. From the researches of M. Humblot, worked out by MM. Milne-Edwards and Oustalet, we find that there are twenty-nine species acknowledged as peculiar; two species from South Africa and twenty-two from Madagascar in process of specification, called by Mr. Milne-Edwards secondary or derived species.

The little Christmas Island, an isolated rock 200 miles south of Java, only twelve miles in length, has been shown by Mr. Lister to produce distinct and peculiar forms of every class of life, vegetable and animal. Though the species are few in number, yet every mammal and land bird is endemic; but, as Darwin remarks, to ascertain whether a small isolated area, or a large open area like a continent, has been more favourable for the production of new organic forms, we ought to make the comparison between equal times, and this we are incapable of doing. My own attention was first directed to this subject when, in the year 1857-8, I spent many months in the

Algerian Sahara, and noticed the remarkable variations in different groups, according to elevation from the sea, and the difference of soil and vegetation. The 'Origin of Species' had not then appeared; but on my return my attention was called to the communication of Darwin and Wallace to the Linnean Society on the tendencies of species to form varieties, and on the perpetuation of varieties and species by means of natural selection. I then wrote:[*] "It is hardly possible, I should think, to illustrate this theory better than by the larks and chats of North Africa. In all these, in the congeners of the wheatear, of the rock chat, of the crested lark, we trace gradual modifications of coloration and of anatomical structure, deflecting by very gentle gradations from the ordinary type, but, when we take the extremes, presenting the most marked differences. . . . In the desert, where neither trees, brushwood, nor even undulations of surface afford the slightest protection to an animal from its foes, a modification of colour, which shall be assimilated to that of the surrounding country, is absolutely necessary. Hence, without exception, the upper plumage of every bird—whether, lark, chat, sylvan or land grouse—and also the fur of all the small mammals, and the skin of all the snakes and lizards, is of the uniform isabelline or sand colour. It is very possible that some further purpose may be served by the prevailing colours, but this appears of itself a sufficient explanation. There are individual varieties of depth of hue among all creatures. In the struggle for life which we know to be going on among all species, a very slight change for the better, such as improved means of escape from its natural enemies (which would be the effect of an alteration from a conspicuous colour to one resembling the hue of the surrounding objects), would give the variety that possessed it a decided advantage over the typical or other forms of the species. . . . To apply the theory to the case of the Sahara. If the Algerian Desert were colonised by a few pairs of crested larks—putting aside the ascertained fact of the tendency of an arid, hot climate to bleach all dark colours—we know that the probability is that one or two pairs would be likely to be of a darker complexion than the others. These, and such of their offspring as most resembled them, would become more liable to capture by their natural enemies, hawks and carnivorous beasts. The lighter-coloured ones would enjoy more or less immunity from such attacks. Let this state of things continue for a few hundred years and the dark-coloured individuals would be exterminated, the light-coloured remain and inherit the land. This process, aided by the above-mentioned tendency of the climate to bleach the coloration still more, would in few centuries produce the *Galerida abyssinica* as the typical form; and it must be noted that between it and the European *G. cristata* there is no distinction but that of colour.

"But when we turn to *Galerida isabellina*, *G. arenicola*, and *G. macrorhyncha*, we have differences, not only of colour, but of structure. These differences are most marked in the form of the bill. Now, to take the two former first, *G. arenicola* has a very long bill, *G. isabellina* a very short one; the former resorts exclusively to the deep, loose, sandy tracts, the latter haunts the hard and rocky districts. It is manifest that a bird whose food has to be sought for in deep sand derives a great advantage from any elongation, however slight, of its bill. The other, who feeds among stones and rocks, requires strength rather than length. We know that even in the type species the size of the bill varies in individuals—in the lark as well as in the snipe. Now, in the desert, the shorter-billed varieties would undergo comparative difficulty in finding food where it was not abundant, and consequently would not be in such vigorous condition as their longer-billed relations. In the breeding season, therefore, they would have fewer eggs and a weaker progeny. Often, as we know, a weakly bird will abstain from matrimony altogether. The natural result of these causes would be that in course of time the longest-billed variety would steadily predominate over the shorter, and, in a few centuries, they would be the sole existing race; their shorter-billed fellows dying out until that race was extinct. The converse will still hold good of the stout-billed and weaker-billed varieties in a rocky district.

"Here are only two causes enumerated which might serve to create, as it were, a new species from an old one. Yet they are perfectly natural causes, and such as I think must have occurred, and are possibly occurring still. We know so very little of the causes which, in the majority of cases, make species rare or common that there may be hundreds of others at work, some even more powerful than these, which go to perpetuate and eliminate certain forms "according to natural means of selection."

It would appear that those species in continental areas are equally liable to variation with those which are isolated in limited areas, yet that there are many counteracting influences which operate to check this tendency. It is often assumed, where we find closely allied species apparently inter-breeding at the centre of their area, that the blending of forms is caused by the two races commingling. Judging from insular experience I should be inclined to believe that the theory of inter-breeding is beginning at the wrong end, but rather that while the generalised forms remain in the centre of distribution, we find the more decidedly distinct species at the extremes of the range, caused not by inter-breeding, but by differentiation. To illustrate this by the group of the blue titmouse. We find in Central Russia, in the centre of distribution of the family, the most generalised form, *Parus pleskii*, partaking of the characters of the various species east, west, and south. In the north-east and north it becomes differentiated as *P. cyaneus*; to the south-west and south into *P. cœruleus* and its various sub-species, while a branch extending due east has assumed the form of *P. flavipectus*, bearing traces of affinity to its neighbour *P. cyaneus* in the north, which seems evidently to have been derived from it.

*(To be continued.)*

## Parliamentary and Law Proceedings.

### PROSECUTION UNDER THE PHARMACY ACT.

### ILLEGAL SALE OF POWELL'S BALSAM.

The case of the Pharmaceutical Society of Great Britain *v.* Sowerby was heard at the Bloomsbury County Court, on October 18, before his Honour Judge Bacon.

In this case Mr. Grey, instructed by Messrs. Flux and Co., appeared for the plaintiffs, who claimed two penalties of £5 each from the defendant, who carries on business at 54A, Kennington Road, for keeping open shop for the sale of poison, namely, Powell's balsam of aniseed, containing morphine. The defendant appeared in person.

Mr. Grey having called attention to the section,

His Honour asked what was the result of the appeal in the chlorodyne case which came before him.

Mr. Grey said his Honour's decision had been affirmed, and handed him the report of the case in the Queen's Bench Division.

Mrs. Partridge then proved the purchase of a bottle of Powell's balsam at defendant's shop on July 10, and again on July 15. On the first occasion she was served by a lady, on the second by the defendant himself. She identified the bottles produced, which had been handed over to Mr. Eastes for analysis, and also handbills given her in the shop, which bore at the bottom the words "J. B. Sowerby, Pure Drug Stores." On the outside of the bottle was a wrapper which bore the word "Poison."

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[*] *Ibis* 1859, pp. 429-438.

The defendant did not deny the sale on the 15th, but said he was not in the shop on the 10th, and asserted that he only had one bottle of Powell's balsam on the premises. He contended it was exempt as being a patent medicine, and handed to the judge a report of another case in which the defendant had succeeded on this ground.

His Honour said it was no use his reading a case decided in Ireland, because he was bound by the decision of the Court of Queen's Bench, which had held that the exemption in favour of patent medicines did not extend to proprietary medicines. He could not distinguish this from the chlorodyne case.

As the defendant still disputed the sale on the first occasion,

Mr. John Partridge was called, and deposed to accompanying his wife on each occasion when she made the purchase. She went into the shop alone, but showed him the bottle when she came out.

His Honour said he must give judgment for two penalties and costs, and in reply to an observation of the defendant that he had no intention of defrauding the Society, said it was not a question of defrauding the Society, but of protecting the public. The Society brought these actions in order to protect the public from unqualified persons dealing in these poisonous commodities.

### PRESCRIBING BY A CHEMIST'S SON.

At Lambeth, on Friday, October 13, Mr. A. Braxton Hicks held an inquiry with reference to the death of Horace Edgar Arthur Denbigh Graham, aged five months, who died on the 8th inst.

Rose Graham, the mother of the child, stated that on the 7th inst. the baby was seized with sickness and diarrhœa, and her husband took it to Mr. Douglas, a chemist, in Lambeth Walk,* who prescribed a powder and medicine. He also took it there on Sunday evening, and the child died at 8 o'clock, having had the diarrhœa all the time.

Denbigh Graham, the husband, said he asked the chemist what was the matter with the child, and told him it had had diarrhœa and sickness. The chemist examined the baby, and gave him some medicine and a powder, also a packet of infant's food. Next evening, the child being worse, witness again visited the chemist, and was then advised by him to take the child to a doctor.

Mr. John Henry Hunt Douglas, of 164, Lambeth Walk, said he was a son of Mr. J. S. Douglas, who was a qualified chemist before the passing of the Pharmacy Act. He was twenty-one years of age, but was not a qualified chemist. He told Graham on the Saturday to take the child to a doctor, but he did not answer, and it being late he prescribed for it. Although not qualified he was allowed to prescribe.

Mr. James Hender, a chemist's assistant, said he saw the deceased on Sunday night, and advised the father to take the child to a doctor.

Dr. John Wood ascribed the cause of death to collapse from diarrhœa and vomiting, due to improper feeding. It was deeply to be regretted, the witness added, that the child was not taken to a doctor instead of a chemist, whose duty it was to dispense and not to prescribe. Calomel, which was one of the drugs prescribed, was an improper thing to administer, and the food recommended by the chemist could only act as an irritant to the stomach and bowels.

Another Mr. Douglas, a duly qualified chemist, informed the Coroner that his father, Mr. J. S. Douglas, was always on the premises, but was now unable to attend to the business. Witness went there occasionally. He accounted for his father's name not being on the Register by saying that he retired some time since and then resumed business.

The Coroner strongly animadverted on the "reprehensible" conduct of chemists in prescribing for children, and said such cases as these should act as a warning to poor people.

The jury returned a verdict in accordance with the medical evidence, and expressed their opinion that the death was accelerated by wrong treatment, and that the chemist was deserving of censure. They also asked the Coroner to report the case to the Pharmaceutical Society.

The Coroner, in conveying the censure to Mr. Douglas, said that the remarks of the jury referred to the whole establishment.

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Mr. Hicks held a second inquiry concerning the death of William Simpson, aged five years, whose parents reside at 40, Newburn Street, Lambeth, and who succumbed to an attack of pneumonia. In this case also the father went to Messrs. Douglas's shop, and asked for something "for a cold." He was given 3*d.* worth of a mixture. This was on the 5th inst., and on the 7th the quantity was repeated. Three days later the child died.

Dr. A. J. Kane, who saw the body after death, said that, with proper medical treatment, the child ought to have been cured. It had caught cold upon cold.

The Coroner said, if poor people only knew that chemists were not doctors many lives would be saved. In this case the chemist actually never saw the child.

Mr. Douglas remarked that the mixture, which was composed of tolu, syrup of squills, and a little balsam of aniseed, had a soothing effect.

The Coroner: Yes, and hid the real danger. You cannot get rid of the fact that this shop is practically in charge of two unqualified persons.

The jury retured a similar verdict, and said the former remarks applied to this case.—*Evening News and Post* and *Standard*.

### POISONING BY CYANIDE OF POTASSIUM.

Mr. A. Braxton Hicks held an inquest on Wednesday last, at the Parish Offices, Putney, with reference to the death of Ebenezer Denton, 45, formerly a private in the 2nd Battalion West Yorkshire Regiment, and latterly an attendant on the insane, who died at 4, Chelverton Road, Putney, on the 16th instant.

Mrs. Ada Denton, the widow, stated that the deceased generally had good health, and appeared in his usual condition on Monday morning, when he left the house at eight o'clock. He returned two hours later, and witness remarked that he would not be able to see the Colonel that afternoon. He told her not to worry herself, adding that he had some stuff which would put him all right in a quarter of an hour. She did not know what he meant, but he said they used to take it in the army. He asked witness to call him at one o'clock, but on going into his room at eleven o'clock she found him lying on the floor at the foot of the bed. On a chair, beside his paper and pipe, was a glass containing some white stuff. Just then Dr. McGeagh called to see her baby, and he pronounced her husband to be dead.

Dr. W. S. McGeagh, of 100, Norroy Road, Putney, said he casually saw the deceased lying on the floor, and, thinking, he was having a "nap," took no particular notice of him. On examining the deceased, after being shown the glass produced, witness at once knew he had taken prussic acid. There was no doubt death was due to the action of that poison. An old retired army officer had told him that it was customary in the army to take cyanide of potassium as a "pick-me-up." It could be bought of wholesale chemists or at any shop where they sell photographic appliances. Witness searched the room, with the Coroner's officer, but was unable to find any paper or bottle that might have contained the drug.

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* In the reports it is stated that, on the facia of the shop, appear the words "Douglas and Son, Dispensing and Family Chemists, Associates of the Pharmaceutical Society." The name of Douglas is not on the Register as of that address, and there is no "Associate in Business" of that name indicated in the Society's Calendar.—[ED. PHARM. JOURN.].

The Coroner, in summing up, animadverted upon the ease with which poisons could be purchased, and said he would lay the facts before the Pharmaceutical Society.

The jury returned a verdict of death by misadventure.—*Standard.*

## Correspondence.

### BENEVOLENT FUND ELECTIONS.

Sir,—In connection with Mr. Hampson's desire to vest the election of Benevolent Fund annuitants in the Council to the exclusion of subscribers, I may mention that, dining the other day with several commercial travellers, by whom at the present time in this district great interest is shown in the election to their Benevolent Institution of a local candidate, I elicited from all of them the opinion that if they had no voice in the election the Benevolent Institution would not have their subscription. Is it not probable that the same feeling is abroad with regard to our Benevolent Fund? Would not our Council be equally liable with a Gladstonian Cabinet to suffer from external "wire-pulling" and "squeezing"?

*Yeovil.* ALFRED WRIGHT.

### BELLADONNA AT THE CONFERENCE.

Sir,—The criticisms of Mr. P. W. Squire on "Belladonna at the Conference," as far as they relate to my paper on "Liquid Belladonna Plaster," are misleading, inasmuch as they are based upon an erroneous assumption. Mr. Squire takes for granted that the solid extracts by 84 and 65 per cent. alcohol respectively, and the liquid extract, were all prepared from the same sample of leaf, whereas the opposite is the case, the three products having been obtained from three different stocks of the drug. These extracts cannot, therefore, be compared among themselves, since they are not referable to a common standard. The fact that in the production of the solid extracts the leaf in each case, after reduction to powder, was percolated with its menstruum until deprived of its alkaloidal principle, and that different percentages of alkaloid per leaf were ultimately obtained, showed one of two things—either that the leaf had varied in alkaloidal content or the manipulation was faulty. Whatever opinion may be entertained of the latter alternative I can swear to the correctness of the former. Still, it is a matter of personal regret to me that the absence of direct information on this point has had the effect of misleading your correspondent. In the light of this explanation, permit me to examine the following statement by Mr. Squire:—"Less than half (46 per cent.) only of the extractable alkaloid passes into the preparation, which is surely no great improvement upon the original formula of the B.P.C." Now, if this be the case, and if I had been cognisant of it at the time of writing my paper, then it had never been published in its present form. But what are the facts as deducible from my own figures? (1) That a given weight of solid rectified spirit extract of the leaf, when treated with a given volume of ether-spirit 1:1, showed a loss of alkaloid in round numbers of from 8 to 13 per cent. (2) That a liquid extract of belladonna of a strength 2 in 1, prepared from English leaves, by percolation with rectified spirit until wholly deprived of alkaloid, when mixed with an equal volume of ether and decanted, showed a loss of 26 per cent. of its alkaloidal content. To have devised a process for the preparation of a liquid belladonna plaster without resorting to a chemical method by which its active principle would be set free, and that contains three-fourths of its extractable alkaloid, I take to be a distinct improvement upon the formula of the B.P.C. The question arises whether the strength represented by the equivalent of a grain and a half of alkaloid per fluid ounce is a convenient one. It has been intimated to me that its potency is too great in view of the use to which it is generally put. As to the discrepancy between Mr. Wright's result and my own in respect to "the direct percolation of a 2 in 1 extract," may not this be largely accounted for by assuming that Mr. Wright used a leaf much richer in alkaloid than the one used by me? What proportion his extracted alkaloid bore to the total extractable alkaloid he does not say, and he supplies no data from which the information could be gleaned. Possibly, too, as suggested by your correspondent, the good results he obtained may in a measure be attributable to a difference in our respective modes of conducting the process of re-percolation. I am quite sure that the members of the Formulary Committee will await with interest the publication of experimental data, by Mr. Squire or others, that will lead to a further amendment of the B.P.C. formula for collodion of belladonna.

*London.* W. A. H. NAYLOR.

### A CORRECTION.

Sir,—I shall feel obliged if you will please note the following correction in your next:—Page 301, column 2, line 8, for *celluloid* read *celloidin.* It is entirely my mistake.

*Ashton-under-Lyne.* GORDON SHARP.

*J. Turner.*—According to the view taken by the Board of Inland Revenue—that, mentioning the name of specific ailments for which the medicine is useful, renders it liable to stamp duty—your label appears to render the preparation liable.

## NOTICES OF MEETINGS NEXT WEEK.

TUESDAY, OCTOBER 24.

*Photographic Society af Great Britain.*
"Balloon Photography," by Capt. Mantell, R.E.
"Lumiére's Experiments in Printing with Manganese Salts," by R. Child Bayley.

*Royal Victoria Hall, London.*
"The Compass in Iron Ships," by Professor Reinold.

WEDNESDAY, OCTOBER 25.

*Brighton Junior Association of Pharmacy,* at 9 p.m.
Short Papers by Members.

THURSDAY, OCTOBER 26.

*Chemists' Assistants' Association,* at 8.30 p.m.
"The Examination of Potable Waters," by E. J. Parry.

*Glasgow and West of Scotland Pharmaceutical Association,* at 9.15 p.m.
"Some Suggestions for the better Government of Pharmacy," by Jas. A. Russell.

SATURDAY, OCTOBER 28.

*Pharmaceutical Football Club v.* St. Mary Abbott's, at Wormholt Farm, Shepherd's Bush, at 3.15 p m.
Reserves *v.* Milwall Swifts, at Milwall.

## BOOKS, ETC., RECEIVED.

TRAITE DE CHIMIE MÉDICALE ET PHARMACEUTIQUE CHIMIE MINÉRALE. Par le Dr. R. HUGNET. Pp. i.-xv., 1 to 1010. Large 8vo. Paris: Baudry et Cie. 30 Francs. From the Publishers.

HANDWÖRTERBUCH DER PHARMACIE, Parts 11 and 12. Edited by A. BRESTOWSKI. Vienna and Leipsic: Wilhelm Braumüller. From the Publisher.

BEITRÄGE ZUR KENNTNIS EINIGER ACOKANTHERA UND CARISSA-ARTEN. Mit einer Figur im Text. Von Dr. L. LEWIN. Separat-Abdruck aus "Engler, Botanische Jahsbücher." Leipzig: Wilhelm Engelmann. Pp. 8. From the Author.

ON AN ARROW POISON FROM NEW GRANADA, and on its Botanical Source. By JOSEPH TILLIE, M.D. Reprinted from the *Journal of Anatomy and Physiology.* Pp. 6. From the Author.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bingley, Eardley, Hill, Nagelvoort, Thompson.

## "THE MONTH."

**Nitro-Metals.** P. Sabatier and J. B. Senderens describe a new series of compounds, which they distinguish by the term *métaux nitrés*. These are formed by the direct union of nitrogen peroxide with certain metals, the vapour being passed at a temperature of 25° to 30° over the metals in a finely divided state, as obtained by the recent reduction of their oxides by hydrogen or carbonic oxide. Copper, cobalt, nickel, and iron are the metals so far experimented with. Nitro-copper, $Cu_2NO_2$, is a brown substance which reacts with great energy with water, nitric oxide being evolved. It was found to contain about 74 per cent. of copper. Though unaffected by dry air at the ordinary temperature, it is dissociated when heated in pure nitrogen. By heating some of the compound in a Faraday V-tube, nitrogen peroxide is liberated and collects in the cold limb in the liquid form, being re-absorbed by the copper when the tube is allowed to cool. Hydrogen only affects the nitro-copper when heated to about 180°, ammonium nitrite and free ammonia being then produced. Carbonic oxide reduces the copper to the metallic state on heating; dry ammonia gas reacts in the cold, metallic copper and ammoniated oxide of copper resulting; and sulphuretted hydrogen also reacts without the aid of heat, water and sulphur being liberated, whilst finally a blue sulphide of copper remains. Nitro-cobalt occurs as a black powder. It reacts violently with water and, when mixed with a combustible substance, forms a dangerous explosive. Nitro-nickel is also black, and resembles the cobalt compound in its properties, whilst nitro-iron is more difficult than the others to isolate, and has not yet been obtained in sufficient quantity for detailed examination (*Bull. de la Soc. Chim.*, [3], ix., 669).

**Crystallised Carbon Silicide.** H. Moissan has obtained silicide of carbon, CSi, in large crystals, by the aid of his electric furnace. The carbon and silicon were combined by heating them together, in the proportion of their atomic weights, with or without the addition of iron; by reducing silica with carbon; or by direct synthesis of the vapours of the two elements. The crystals sometimes occur as regular hexagons, and are colourless and transparent when no trace of iron is present and the operation is rapidly performed. More frequently, however, they are yellow and, occasionally, specimens are coloured blue like the sapphire. They have a marked action on polarised light, their density is 3·12, and they are sufficiently hard to scratch chrome steel or the ruby. Heated in air, oxygen, or sulphur vapour, at 1000°, they remain unaltered. Chlorine affects them slightly at a temperature of 600°, but more powerfully at about 1200°. Fused potassium nitrate or chlorate; boiling sulphuric, hydrochloric, or nitric acid; and even aqua regia and a mixture of nitric and hydrofluoric acids, have no effect upon them. The carbon present may be oxidised, however, by repeated combustion with lead chromate, and fused caustic potash at a red heat causes disintegration of the crystals, with formation of potassium carbonate and silicate (*Comp. rend.*, cxvii., 425).

**Ruthenium Red.** At the meeting of the Paris Academy of Sciences on December 26 last, a note was communicated by A. Joly on certain compounds formed by the action of ammonia on ruthenium sesquichloride (*Comp. rend.*, cxv., 1299). One of these compounds, the ammoniated oxychloride of ruthenium, was obtained in the form of small brown crystals which formed a red transparent solution that appeared violet by reflected light. Its staining power could only be compared with the strongest colouring matters of organic origin, silk being died reddish-brown by simple immersion. The dry substance was not affected by light, but the aqueous solution was decolorised slowly by the sun's rays, depositing at the same time a brown precipitate of sesquioxide. Decomposition proceeded more rapidly on boiling. The oxychloride was insoluble in alcohol, which precipitated it from aqueous solutions, and this fact was taken advantage of to purify the compound. More recently (*Comp. rend.*, cxvi., 653) the use of this ruthenium red as a histological stain has been advocated by L. Mangin. He describes it as soluble in water, concentrated calcium chloride solution, or alum solution; insoluble in glycerin, alcohol, or oil of cloves. Dilute mineral acids (one per cent.) decolorise solutions of the red or turn them brown, but the original tint is restored by alkalies, though an excess of the latter causes a granular precipitate to form. Dilute organic acids (five per cent.) do not affect the colour. In its action upon vegetable tissues, etc., the compound is distinguished by not affecting cellulose or callus, and by its variable action on pectic compounds. It acts powerfully on gums and mucilages derived from pectic compounds, without colouring the mucilages formed from cellulose or from the products of the liquefaction of callus. In conclusion, Mangin asserts that ruthenium red is the best reagent for the pectic compounds associated with cellulose in young tissues and in older tissues which have not been modified by the action of foreign matters. Further, he claims that it is the only reagent for the transformation products of pectic compounds, that is to say, most gums and mucilages.

**Rubidium Iodide.** It has been claimed that rubidium salts have the same therapeutic effect as those of potassium, without possessing the disturbing influence of the latter, but a bar to their general employment has been the difficulty of producing them in a sufficiently pure condition. It is stated that this difficulty has now been removed by the new process of Dr. E. Erdmann for the recovery of rubidium salts from the Stassfurth potash deposits, and that the preparation of rubidium iodide on a large scale has been undertaken. This compound forms white, non-efflorescent crystals, which are odourless and of milder taste than the corresponding potassium salt. It is also more readily dissolved by water than the latter, and has been administered internally in 2½ per cent. solution, externally in drops containing 5 per cent., and in ointment of the same strength with soft paraffin as a basis. If the statements made by various professors and practising physicians, regarding the action of the salt, should be confirmed, further proof will be afforded of the connection supposed to exist between physiological action and physical and chemical characters. If potassium salts owe their more prompt action, as compared with sodium salts, to their higher molecular weight and greater electrolytic conductivity, rubidium salts may naturally be expected to take a higher position on similar grounds. Whilst the molecular weights of the three elements are: Sodium, 23; potassium, 39; rubidium, 85·4, the electrical conductivity of their iodides shows a similar ascending progression, thus—

| Dilution. | Sodium Iodide. | Potassium Iodide. | Rubidium Iodide. |
|---|---|---|---|
| d = 32 | 105·7 | 128·5 | 130·6 |
| d = 1024 | 119·1 | 140·7 | 144·3 |

and these data are said not only to "represent the actual and relative rapidity with which the different iodides are distributed throughout the organism, under the influence of osmotic pressure and electrical currents, but they also afford a direct measure of their degree of medicinal activity, for physiological activity is occasioned by ability to enter into chemical reactions, and, according to the new general law discovered by Ostwald, chemical activity is proportional to electrolytic conductivity" (*Therapist*, iii., 89).

**Preparation of Hydrogen.** J. Ball, of the Royal College of Science, notes that he has recently observed that, by the addition of a few drops of cobalt nitrate solution to the acid and zinc in a hydrogen apparatus, the rate of evolution of the gas is enormously accelerated, especially at the beginning of the reaction. The cobalt nitrate appears to be almost unaltered. A very thin film of cobalt was deposited on the zinc, but the amount deposited was much too small to weigh. A similar action is exerted by a solution of a nickel salt. Another correspondent confirms the statement made by Ball, remarking that he has been accustomed to make use of this property of the cobalt salt for some time past (*Chem. News*, lxviii., 184).

**Detection of Eserine.** The reaction referred by J. B. Nagelvoort (*ante*, p. 280), as being similar to that of da Silva (*ante*, p. 182), is described in the revised American edition of Flückiger's 'Reactions,' which the former has translated and enlarged, in the following extracts:—"(*a*) An amorphous residue of a permanent blue colour is obtained if a trace of the alkaloid, or one of its salts, is evaporated in the presence of an excess of ammonia; this blue alkaloid dissolves in dilute acids with a red colour; sensitiveness 0·00001 Gm. (1-100000). The solution has a beautiful red fluorescence in reflected light; when evaporated, it leaves a residue that is green at first, changing to blue afterwards, the blue residue being soluble in water, alcohol, and chloroform, but not in ether. Chloroform extracts the blue colour from the watery ammoniacal solution only partially. The blue solutions are reddened at first by $H_2S$, and discolored afterwards. The blue colour is restored by expelling the $H_2S$ on the water-bath. (*d*) A red fluid is obtained when 0·010 Gm. eserine or its salicylate, 0·050 Gm. of slacked lime, and 1 C.c. of water are added together. Warmed in a water-bath, it turns green, and a piece of red litmus paper suspended in the test tube colours blue; a glass rod moistened with HCl gives off the well known white clouds characteristic of an ammonia reaction.—The green solution does not lose its colour by evaporation. Baryta water added to an eserine solution gives a white precipitate, that turns red when strongly agitated; sensitive to 0·00001 Gm. (1-100000). Dissolve for this test 0·010 Gm. eserine salicylate in 100 C.c. of water (1:10000). One C.c. of this, agitated with 5 C.c. of baryta water, gives a bright pink-red coloured fluid. One C.c. of the 1:10000 solution diluted to 10 C.c. will give a faint pink-red coloured fluid, when shaken with 5 C.c. of baryta water; 1 C.c.=1:100,000." In substance the above description appeared in the original German text by Professor Flückiger (Berlin, 1892), but it has been somewhat elaborated and extended by the translator.

**Gelatinous Silver Cyanide.** This compound was referred to by Stas (*Comp. rend.*, lxxiii., 998) some time ago, but he gave no method for obtaining it. L. K. Frankel now describes how a transparent gelatinous mass, somewhat resembling aluminium hydrate, but of greater consistency, occurred as the result of an experiment in which it was proposed to reduce silver chloride to metallic silver by fusion with potassium cyanide. By a quantitative determination it was shown that the compound formed contained five per cent. less silver than theory required for silver cyanide. It was soluble in ammonium hydrate, reprecipitated from the solution by nitric acid, and did not fuse on heating, but decomposed, leaving a residue of metallic silver. The presence of cyanogen was readily detected, and no chlorine was found. Subsequent attempts to produce the substance have failed (*Chem. News*, lxviii., 178).

**$H_2O_2$ from Urine.** Dr. A. Richardson finds that hydrogen peroxide is formed when fresh urine is exposed to sunlight and oxygen, and is stable when the liquid has been previously sterilised, although rapidly decomposed when active organisms are present. In decomposing urine it may happen that no peroxide can be detected, even when exposure to light has taken place. In such a case it has yet been formed, however, and subsequently become decomposed, destroying by its decomposition such organisms as existed in the urine. Fresh urine was found to possess antiseptic qualities, after exposure, owing to the formation of hydrogen peroxide, and to the action of the latter compound the sterilisation of urine by light is largely, if not entirely, due (*Journ. Chem. Soc.*, lxiii., 1109).

**$H_2O_2$ as a Disinfectant.** It is pointed out by Traugott that hydrogen peroxide may be substituted for corrosive sublimate or carbolic acid, as a disinfecting agent, when sufficient time (fifteen to thirty minutes) can be allowed for it to act properly. It is not suitable for the purpose, however, if it be desired to effect disinfection rapidly (*Zeit. f. Hygiene*, xiv., 427).

**Iridin.** This is the name applied by Laire and Tiemann to a new glucoside, of peculiar composition and remarkable properties, which they have discovered in the dried rhizomes of *Iris florentina*. It was obtained in amorphous white flakes. These on drying formed a powder from which, on purification and crystallisation from boiling alcohol, fine white needles separated, which became yellow in moist air and melted at 208°. The formula calculated for the compound is $C_{24}H_{26}O_{13}$. Iridin is described as being almost insoluble in alcohol (2 Gm. per litre at ordinary temperatures), more readily dissolved by acetone (30 Gm. per litre), insoluble in ether, ethyl acetate, benzene, and chloroform. Hot alcohol dissolves it readily, and chloroform precipitates it from its solution in acetone. Dilute mineral acids do not attack it at ordinary temperatures, and, by the action of aqueous alkaline solutions, deep yellow solutions result from which, after a short time, the unchanged substance can no longer be separated by acids. At 80° to 100°, dilute alcoholic sulphuric acid decomposes iridin, according to the following equation:—

$$C_{24}H_{26}O_{13} + H_2O = C_6H_{12}O_6 + C_{18}H_{16}O_8,$$

glucose and a crystallisable substance, termed *irigenin*, being formed. From an alcoholic solution of the latter, distinct rhombohedra separate on adding water. These crystals melt at 186°. They dissolve easily when warmed with alcohol, benzene, or chloroform, and, at the ordinary temperature, in ethyl acetate and chloroform, whilst water has but a slight solvent action upon them, and ether and light petroleum still less. Irigenin is said to have the properties of a phenol, very dilute alcoholic solutions being coloured deep violet by ferric chloride. Alkalies dissolve it with rapid decomposition, and from these solutions, after a short time, acids throw down an amorphous precipitate only. Irigenin contains two hydrogens easily replaceable by acetyles. *Dibenzolirigenin*, $C_{18}H_{14}O_8(COC_6H_5)_2$, was prepared by the action of benzoyl chloride upon a fresh solution of irigenin in dilute alkali, and forms a white crystalline powder, soluble in alcohol and melting at 123° to 126°. *Diacetylirigenin*, $C_{18}H_{14}O_8(COCH_3)_2$, was formed by heating in a closed tube, for three hours, five parts of irigenin with five of melted sodium acetate and ten of acetic anhydride. It, also, forms a white crystalline powder, melting at 122°, soluble in hot alcohol, only slightly so in ether, and insoluble in water or benzene. The addition of a drop of chloroform causes it to deliquesce immediately. From a solution in chloroform, light petroleum precipitated beautiful white plates, melting at 82°, and consisting of a double compound of diacetylirigenin and chloroform. The greater part of the chloroform volatilised on exposure to the air for some time, but the melting point did not change. Submitted to the action of alkaline hydrates irigenin is converted into formic acid, *iridic acid*, and a phenol, *iretol*, thus—

$$C_{18}H_{16}O_8 + 3H_2O = CH_2O_2 + C_{10}H_{12}O_5 + C_7H_8O_4.$$

Iridic acid, $C_{10}H_{12}O_5$, forms colourless prisms, melting at 118°. It is soluble in water, alcohol, benzene, and ether, but not in light petroleum. By heating it above its fusion point, it is decomposed into carbon dioxide and a colourless oil from which large crystals of a new phenol, *iridol*, $C_9H_{12}O_3$, may be obtained. These crystals melt at 57°. Iridol in alkaline solution, acted upon by chloroform, yields two isomeric aldehydes, of the formula $C_7H_4(COH)(OCH_3)_2OH$. The methyl derivative of iridol, $C_{10}H_{14}O_3$, oxidised by potassium permanganate, yields trimethylgallic acid. Iretol, $C_7H_8O_4$, the phenol formed by the decomposition of irigenin, may be regarded as the methylic ether of tetroxybenzene. Its aqueous solution is transformed by sodium amalgam into a compound, melting at 208°, identical with chloroglucin. With benzoic aldehyde, iretol gives vanillin as a condensation product. Ferric chloride colours its aqueous solution violet, strong oxidising agents convert it into oxalic acid, whilst alkalies split it up into acetone and acetic acid. The authors suggest that, although iridin and irigenin may be carbohydrates resembling the sugars, and may possibly result naturally from the dehydration of sugar in the plant, it is probable that the reaction is a much more complicated one (*Journ. Am. Chem. Soc.*, xv., 351, and *Comp. rend.*, cxvii., 438).

**Potassium Permanganate as an Antidote.**

Schlagdenhauffen and Reeb refer to the fact that J. Antal has found permanganate of potassium act as an antidote to phosphorus (see also *Pharm. Journ.*, [3], xxii., 809), muscarine, strychnine, colchicine, oil of savin, and oxalic acid, when administered to frogs, rabbits, and dogs, with or directly after the poisons, and then proceed to describe the result of experiments conducted by themselves to ascertain the effect of the permanganate upon coronillin, $C_{11}H_{12}O_5$, a poisonous bitter principle isolated by them some years ago from the leaves of *Coronilla Scorpioides*. They find that when the salt is placed in direct contact with the glucoside the latter is decomposed, being entirely oxidised, and physiological tests, in which frogs, pigeons, and guinea-pigs were used, seemed to prove that the permanganate is a true antidote to the poison when administered within a sufficiently brief time after the latter (*Journ. der Pharm. von Elsass-Loth.*, xx., 322).

**$Fe_2Cl_6$ for Sterilising Water.**

F. Watts describes a simple method of sterilising water for domestic purposes, which has been extensively employed, with apparently good results, in the Leeward Islands. It consists in adding to hard water sufficient neutral ferric chloride solution to produce a perceptible precipitate. In the case of soft water, a small quantity of lime water or dilute sodium carbonate solution is added after the ferric chloride solution, and so causes a precipitate to form. In either case vigorous stirring promotes the granulation and subsidence of the precipitate, and, after this has subsided, the clear water is drawn off for use. With small quantities of water it may be found advantageous to subsequently pass the water through a simple form of filter, such as a felt bag, or clean sand in a shallow box or a flower-pot, but this is unnecessary with large quantities. One to one and a half fluid ounce of B.P. liquor ferri perchlor. fort. is stated to be sufficient to purify one hundred gallons of water. By treating sufficient for a day's supply at night, the pure water will be ready for use in the morning (*Chem. News.*, lxviii., 178).

**Fixation of Iodine by Starch.**

G. Rouvier has devoted further attention to this subject, in the hope of finding a more exact method of determination, and finds that, the weight of starch and other conditions of the experiment being constant, if the proportion of iodine added be increased, the amount fixed also increases at first until, if a sufficient quantity be employed, a compound is obtained containing practically 19·6 per cent. of iodine and corresponding to the formula — $(C_6H_{10}O_5)_{16}I_5$ (*Comp. rend.*, cxvii., 461).

**Alkaloidal Assays.**

The *Datura Stramonium* has been examined by Dohme with a view to ascertaining the relative alkaloidal value of its various parts, and he finds that the stem is richest in alkaloid, the seed coming next in order, then the leaves, and finally the roots. The plants examined were growing wild in the vicinity of Baltimore, U.S.A., and were gathered during July and August. The parts were separated while fresh and some assayed undried, the rest being carefully dried, powdered, and assayed within about a week of gathering. The stems, roots, and leaves marked "a" and "b" were all taken from the same plants, gathered in July, but the seed was older and of indefinite origin. The parts marked "c" were from plants collected in August, and some, marked "green," were assayed in the fresh state. The methods employed for the determinations were Lyons' for specimens marked "a," and Dragendorff's for those marked "b" and "c." Dragendorff's method was modified so as to be used as a gravimetric process, and differed from that of Lyons, which did not give such good results, merely in the use of dilute alcohol and tartaric acid in the place of Prollius' fluid. The figures obtained were as follows:—

| Part of Plant used. | Gravimetric percentage. | Percentage by titration of former. |
|---|---|---|
| Leaves ............(a) | 0·654 | 0·214 |
| " ............(b) | 0·554 | 0·231 |
| " ............(c) | 1·420 | 0·231 |
| " green ...(c) | 1·420 | 0·271 |
| Stems ............(a) | 0·770 | 0 306 |
| " ............(b) | 1·060 | 0·358 |
| " ............(c) | 0·931 | 0 439 |
| " green ...(c) | 1·000 | 0 467 |
| Roots ............(a) | 0·496 | 0·138 |
| " ............(b) | 0·790 | 0 173 |
| Seed ............(a) | 0·556 | 0·248 |
| " ............(b) | 0 596 | 0·289 |

The percentage of moisture in the plants was found to vary from 75 to 85 per cent., and some slight loss of alkaloid appeared to occur during the process of drying, as will be seen by comparing the figures given. A similar investigation of the leaves, stems, roots and seed of *Hyoscyamus niger*, collected in June and imported from Hungary, gave results which seemed to show that the stems and seed contained little or no alkaloid, the roots 0·017 per cent. only, and the leaves 0·173 per cent. (*Am. Journ. Pharm.*, lxv., 479).

**A kind of Curara acting on the Heart and Muscles.**

Dr. J. Tillie has examined an arrow poison used by Indians in New Granada (Colombia), and portions of the plants from which it is said to be prepared. All the botanical specimens are referred to the genus *Strychnos*, but the evidence so far obtained is insufficient for the precise recognition of species. The curara is described as almost black in colour, odourless, brittle, and easily powdered. It dissolves in water, leaving a slight residue, and a two per cent. solution is dark red in colour, somewhat bitter, and has a slightly acid reaction. Physiological experiments on frogs showed its action to be a paralysing one upon the endings of the motor nerves. Some poisoned blowpipe darts from the same district were also examined, and the curara dissolved from their tips was found to produce rapid and absolute paralysis of the muscle of the frog's heart, the respiration continuing; absolute paralysis and rigidity of the skeletal muscles at a much earlier period than happens in the case of an animal whose circulation has been artificially arrested; and exemption of the motor nerves from paralysis until after death and until the muscles show signs of poisoning. In experiments with a rabbit, the absence of motor weakness until near death, the marked action of the poison upon the heart, and the early total paralysis of muscles and onset of rigidity, distinguished the action of the curara from that of the ordinary kind, which does not affect the heart or muscles. It is pointed out, therefore, that this South American curara, though in all probability derived from one or more species of *Strychnos* (see *Pharm. Journ.*, [3], xxiii., 946), resembles in action the strophanthus type of the African arrow-poisons. A few particles of it added to a drop of cold strong sulphuric acid produced within a few minutes a dark red colour, changing to a muddy brown in less than fifteen minutes. When heated with the sulphuric acid to 110°–120° F., a tinge of green appeared at the edge of the brownish-red drop, and within forty minutes a very faint olive colour was seen. In view of the fact that curara may consist of curarine-acting or digitalin-acting principles, or of mixtures of these in unknown strength and proportion, it is suggested that it is undesirable, without a careful preliminary examination of each specimen, that crude curara should be employed in place of the alkaloid, curarine, in accurate physiological experiments on the circulation or upon muscle, and especially as a therapeutic agent to be administered by hypodermic injection. It is stated, on the authority of Dr. Whiteford, that in the district of Antioquia, whence the poisoned darts, etc., were brought, the word "curara" and its variations are used by the Indians in the sense of the generic term "poison," and may be applied to any poisonous substance, whether of vegetable or animal origin. It would seem, therefore, that the arrow poison is not called curara because obtained from the curari plant, "but rather that various plants are called curari, woorali, etc., because they yield curara (*i.e.*, poison)" (*Journ. Anat. and Phys.*, xxvii., 402, and xxviii., 96).

**Precipitation and Boiling Points.**

R. Engel has previously shown that to precipitate one molecule of a chloride from a saturated solution at 0°, one molecule of hydrochloric acid must be added in the case of monovalent chlorides and two molecules in the case of bivalent chlorides, the law of definite proportions thus holding good even in solutions. He now shows that the same rule prevails at temperatures other than 0°, and with double chlorides. The double chloride of copper and ammonium, of which the molecule contains four atoms of chlorine, requires four molecules of hydrochloric acid for the precipitation of one molecule. It is further pointed out that, at the freezing point, in the case of saturated solutions of alkaline chlorides, bromides, and iodides, a relation exists between the solubility of the compound and the atomic weights of the elements constituting the molecule (*Comp. rend.*, cxvii., 485.)

**Ferment in Capers.**

L. Guignard finds that the existence of special ferment cells is general among the Capparideæ. By their morphological characters in the root and stem they resemble those found in the same organs in the Cruciferæ, whilst in the leaf and flower of the caper plant (*Capparis spinosa*, L.)

they are grouped in a peculiar manner. The reactions of the cell contents are identical with those of myrosin. It is in capers that the ferment cells are most numerous and the glucoside, of which the decomposition takes place in the same manner as in the Cruciferæ, is most abundant. The ferment present exists chiefly in the flower and the pulp of the fruit. The seed, on the other hand, in all the Capparideæ, is relatively poor both in ferment and glucoside, what is found of the former constituent being in the embryo (*Comp. rend.*, cxvii., 493).

**Catha edulis.** E. Collin deals with this member of the Celastraceæ, the younger shoots and leaves of which constitute the Arabian drug Kât, Khat, or Cafta, a specimen of which was exhibited at an evening meeting of the Pharmaceutical Society, in February, 1887, by Mr. C. B. Allen, and subsequently examined by Dr. B. H. Paul (*Pharm. Journ.*, [3], xvii., 1009), who failed to find any caffeine or analogous substance present. The plant appears to be cultivated throughout Arabia with great care. After giving details of the method of cultivation, the microscopical appearance of the epidermis of the leaf and transverse sections of the latter and stem are described and illustrated by Collin. He refers to the fact that Flückiger isolated an alkaloid, katine (*Pharm. Journ.*, [3], xviii., 224), from the leaves, and states that the Arabs masticate the latter with avidity in order to keep them awake throughout the night. The Somalis are said to attribute to the drug a similar effect to that produced by the smoking or chewing of opium. The results of some physiological and therapeutical observations are quoted as indicating that the drug powerfully excites the nervous system, banishes sleep, restores the physical forces, and sustains muscular activity. Medicinally, the leaves are used to make an infusion (5 to 15 Gm. per litre), a tincture, and an extract (*Journ. de Pharm.*, [5], xxviii., 337).

**Rubia sikkimensis.** Perkin and Hummel have examined the colouring principles of the root of this plant, which yields a brilliant red dye, used by some of the hill tribes of India. The root was extracted with boiling alum solution, and yielded a red crystalline compound having all the properties of purpurin, another apparently identical with the munjistin, or purpuroxanthincarboxylic acid, obtained by Stenhouse from munjeet, *Rubia munjista* (*R. cordifolia*), and a third substance, which somewhat resembled purpurin, but was not obtained in sufficient quantity to enable its constitution to be determined. A yellow mass of crystals was also separated which seemed to be identical with purpuroxanthin. Almost identical results were obtained when munjeet was examined on similar lines (*Journ. Chem. Soc.*, lxiii., 1157).

**Maize as a Sugar Producer.** F. L. Stewart gives an account of the results of an investigation concerning the value of Indian corn as a sugar producing plant, under new conditions of growth and development. It has been found that from the time sugar first shows itself in the cell sap, during the early growth of maize, until the grain begins to harden, it steadily increases in quantity. Then it suddenly diminishes and, finally, disappears. If, however, the ear of corn be removed promptly, at the critical period, all the energies of the plant become directed to the work of storing up more complex reserve materials in the cells of the stalk, the principal function of which thus becomes the accumulation of sugar. Since it is claimed that the immature grain, cured by the ensilage system, constitutes the best, most nutritive, and most readily preserved form in which it can be utilised for stock feeding, it follows that two valuable crops may be secured from the same plants instead of one only. As regards the sugar yield, it is shown that by adopting the method described, the normal 7 to 8 per cent. of sucrose in the juice, at the period when it is richest, is increased to 13 to 16 per cent., *i.e.*, more than is found in good average samples of either East India or Louisiana sugar cane (*Science*, xxii., 143).

**Plane-tree Honey.** E. Jandrier describes a sweetish exudation found during dry summers on plane trees (*Platanus orientalis*). It varies considerably in appearance, being sometimes dry and brilliant, at others pasty and yellowish. Besides a small quantity of a reducing sugar, apparently glucose, it contains from 80 to 90 per cent. of mannite, which may be readily extracted by crystallisation from boiling alcohol (*Comp. rend.*, cxvii., 498).

**Germination of the Castor-oil Seed.** L. du Sablon has studied the chemical changes which occur during the germination of the castor-oil seed, and publishes a tabular statement according to which it appears that, whereas the proportion of oil in the dried material of the seed-albumen and embryo as found in the resting seed was 69 per cent., it gradually decreased as germination proceeded, until, when the radicle was 12 Cm. long, the albumen contained but 11 per cent. and the embryo 7 per cent. of oil. Fatty acids are also present during germination, the proportion increasing, although somewhat irregularly, until it exceeds 0·5 per cent. at the end of the process. The presence of glycerin could not be ascertained with certainty. Glucose or reducing sugar, though not constituting more than 0·4 per cent. of the seed normally, notably increases in amount as germination proceeds. As much as 14 per cent. was found in the dried material of the seed-albumen, when the radicle had attained a length of 10 Cm., and in the albumen and embryo, considered together, the proportion of sugar equalled nearly 20 per cent. It is suggested that these facts seem to indicate that the sugar is probably produced by direct transformation of the oil in the seeds (*Comp. rend.*, cxvii., 524).

**Structure of Parasitic Phanerogams.** G. J. Peirce has studied, in some phanerogamic parasites, the structure of the haustoria or suckers which penetrate the tissues of the host plants, and has been able to establish an important structural distinction between certain plants which are absolutely dependent on others for their nourishment and one, the mistletoe, which is only partially so. Thus, in parasites belonging to three distinct families (Convolvulaceæ, Rafflesiaceæ, Balanophoreæ) sieve-tubes were found to be present in the haustoria, forming a direct connection between the sieve-elements of the host and those of the parasite. Similarly, the haustorial xylem connects xylem groups of the host and parasite. But it is through the sieve-tubes that carbohydrates are conducted, hence the importance of their presence in the haustoria of parasitic plants—such as the *Cuscuta* and *Rafflesia*, which have no green tissues in which food can be elaborated—since all the food-substances needed are supplied by their means. The *Viscum album*, on the other hand, is abundantly supplied with chlorophyll, both in leaves and stem, and is quite capable of elaborating its own food, if only the crude materials are supplied. It is not strange, therefore, that in the tissues of the haustorium of the mistletoe no sieve-tubes could be detected, nor any connection between the different phloem elements. Only the substances existing in the xylem of the host can be conducted into the parasite, and the conducting system is imperfect, both mechanically and in physiological efficiency. Aqueous solutions of crude materials alone can thus be supplied to the mistletoe, which may be described as a "water-parasite," its host performing for it all the functions of a root—absorption, conduction, mechanical support—but those only (*Annals of Botany*, vii., 291).

**Aleurone-Layer in Grasses.** P. Groom finds that the cells composing the aleurone-layer of the seed of grasses contain a rich stock of oil in the protoplasmic network, whilst numerous aleurone-grains occur in the meshes of the protoplasm and form the greatest portion of the oil-contents. In most cases, however, the grains consist chiefly of globoids with only envelopes of proteid matter, a typical specimen being roughly spherical and consisting of a small proteid shell encasing a large central globoid. The aleurone-layer is hence notably a receptacle for phosphates. After treatment with alcohol the proteids of the grains become partially insoluble in water and, in the case of *Zea Mays*, they are not dissolved by a one per cent. potash solution, even after twenty-four hours (*Annals of Botany*, vii., 387).

**Coccus Cacti.** Dr. Paul Meyer has made some observations on living cochineal insects at the Naples Zoological Station. The embryos develop completely within the mother, but are born within egg-shells. The red pigment is not found within any organ apart from the diffuse fatty body and the yolk. It does not occur in skin, gut, salivary glands, excretory tubules, or blood, and nothing is yet known regarding its use to the insect. Carminic acid is said to be a product of metabolism. The coccerin secreted by the wax-glands, which are particularly abundant near the anus, serves to enclose the excreta and so prevent the body of the insect being soiled. It passes out in long threads by the "wax-hairs" and in short curved ones by the "wax-pores" (*Journ. R. M. S.*, 94, 324).

**Disinfectants and Disease Germs.** C. Chamberland and E. Fernbach, in a lengthy paper on the disinfection of rooms, describe the results of a great number of experiments with different disinfectants on bacteria in various conditions. They find that the eau de javelle of commerce, chlorinated lime (a 1 in 12 solution diluted to ten times its volume with water), and commercial hydrogen peroxide, are more active than a 1 in 1,000 acid solution of corrosive sublimate. When employed at the ordinary temperature, however, they do not act, or only after several hours, upon moist germs, but, if they be heated to 40°–50°, or even higher, these germs are destroyed rapidly, a few minutes sufficing. It would seem desirable, therefore, to use disinfectants at as high a temperature as possible. Dry germs were found to be much more resistant than moist ones, for where a few minutes sufficed to kill the latter, the dry forms were able to resist a temperature of 40° to 50° for several hours. Before the disinfectants could act properly also it was necessary to soak the dry germs in water, preferably lukewarm, for about an hour, after which they were as readily acted upon as moist germs. It follows, therefore, that it should be regarded as absolutely necessary that the walls of rooms should be sprayed with water before a disinfectant is employed. A noteworthy fact to which attention is called is that concentrated solutions of chlorinated lime are much less active than the same diluted with ten or twenty times their volume of water. This holds good whether moist or dry germs are to be destroyed, and at either the ordinary temperature or at 50° C. The *Bacillus subtilis* was the organism chiefly experimented with, being selected on account of its great resisting power. When the germs were in the moist condition liquid cultures were mixed with disinfectants, in definite proportions, and the whole well shaken together. Cultivations were made from the mixtures from time to time, and the results checked by some of the original culture that had not been acted upon by disinfectants. The dry germs were treated upon glass slips, and not upon silk threads, as is usually the case. With regard to the action upon other organisms of the disinfectants employed, they were found to destroy in a few minutes, and at the ordinary temperature, the spores of *Bacillus anthracis*, *Aspergillus niger*, *Saccharomyces cerevisiæ*, and *B. typhosus*. Thymol, lysol, and oil of turpentine were found to yield relatively bad results as disinfectants, and preference was given to chlorinated lime solution, diluted as above (*Ann. de l'inst. Pasteur*, vii., 433).

**Humanised Milk.** Dr. S. Smith, writing to the *British Medical Journal* on this subject, refers to Clague's paper (*Pharm. Journ.*, [3], xxii., 651), and gives the details of a method devised more recently by his brother. According to this, 6½ ozs. of new milk should be placed in a tall and narrow vessel of about 7 ozs. capacity and allowed to stand for twelve hours, after which the cream is removed. The skimmed milk is then heated to 70°–80° F., and 40 minims of essence of rennet added whilst stirring. After allowing to stand at rest for five minutes, the curd is broken up, and the temperature gradually raised to 150° F., the curd being repeatedly broken up and worked into a mass with a spoon. The whey is next poured off, boiled to destroy the ferment and coagulate the albumin, and filtered while hot through fine flannel previously thoroughly wetted. Bicarbonate of soda, 5 grains, and sugar of milk, 110 grains, are then added to the hot filtrate, after which both the whey and previously removed cream are mixed with 13½ ozs. of new milk, and the mixture is brought to the boiling point. Milk so prepared is said to keep good for forty-eight hours. The skin that forms should be carefully removed immediately before use and the cream that has risen stirred in. Another correspondent in the same number recommends the following formula:—"Cream (20 per cent. fat), 1½ oz.; milk (cow's), 1 oz.; water, 5 ozs; sugar of milk, 3½ drachms. Steam or boil for fifteen or twenty minutes; when cool add lime water, ½ oz."

## THE MEDICAL PROFESSION, THE PUBLIC, AND MEDICAL ETIQUETTE.*

### BY ERNEST HART, D.C.L.

Sir Astley Cooper, one of the greatest surgeons and most accomplished gentlemen of the last generation, was in the habit of addressing candidates for membership of the Royal College of Surgeons of England, of which he was President, somewhat in the following words :—"Gentlemen, you are about to enter on a noble and difficult profession; your success in it depends on three things: First, on a good and thorough knowledge of your profession; secondly, on an industrious discharge of its duties; and thirdly, on the preservation of your moral character. Without the first—knowledge—no one can wish you to succeed; without the second—industry—you cannot succeed; and without the third, even if you do succeed, success can bring you no happiness." Those words might form a very adequate summary text for the guidance of the conduct of all medical men. And it might conceivably be asked whether there is any necessity for a more detailed and elaborate code. On the other hand it has from time to time lately in our country been found necessary to reinforce and strengthen our code by additional declarations, and the need for a stringent upholding and development of the code has also become a question of the day. I think it is clear that if ever there were such necessity, at no time could it be stronger than at the present moment. For under the stress of modern social development, under pressure of the modern temptation for advertising and the severity of competition, in view of the arts of those who make advertisement a business and a profit, in presence of the temptations held out to draw medical men from the ancient paths of modesty and self-effacement, there is now stronger reason than ever to fortify ourselves against those growing and innumerable seductions by an ethical code so exact, so far-reaching, that the physician need never be in doubt as to what is his duty in any complication, or in the face of any doubtful case in which he may be inclined to give himself the benefit of the doubt.

Our rules of medical etiquette stand upon a strong logical basis, and their strict enforcement is for the benefit of the public, at least as much as, if not even more than, for the benefit of the profession. Medical etiquette has been sneered at by shallow cynicism as mere trades unionism. It is, on the contrary, a self-denying code which is made in the interests of pure morality, and for the benefit of the public far more than for the interests of the profession. This allegation of trades unionism is the converse of that of inutility, which those who are prone to call themselves of the younger school allege; but not even the youngest of us are infallible, and in this matter it is the youngest who are most likely to go wrong. They proclaim themselves liberals. Is it, however, in some cases the liberalism of Gallio? Let us look at this matter from the largest and most liberal standpoint. Let us begin by comparing our code with the standards of the legal profession.

My distinguished friend, Sir Edward Clarke, lately the Solicitor-General of England, in writing to me on the subject recently, said the essence of the matter might be summed up in a very few words: "Every lawyer ought to be a gentleman and ought to do only what is right and honest; if he does not other men ought to have nothing to do with him." Notice that, "if he does not other men should have nothing to do with him." That position of the bar should be strengthened by this, that the etiquette of the bar is absolutely in the hands of the bar, circuits, and attorney-general, and that of the solicitors in the hands of the Incorporated Law Society, so that any solicitor who is guilty of an offence, whether as a lawyer or as a gentleman, can be, and from time to time is, not only temporarily suspended but deprived of the right to practise at all. In a case tried last July in England, a solicitor in a certain town had been the proprietor of a house used for an immoral purpose, of which he received the rent. That was considered a stain upon his character as a gentleman, and for that he was suspended from the roll and excluded from practice. So that we have at least the example of the legal profession, who have a code even stricter than ours, in insisting upon a high standard of honourable conduct in the profession.

Legal etiquette prescribes certain technical acts which a lawyer must not do. An eminent American lawyer, whom I had the pleasure of meeting, mentioned to me, for example, that he may not conduct a "speculative suit"—that is, he may not conduct a suit in which his pay is to depend on the success of the suit—a palpable restriction on his liberty. Liberty is a blessed word, but compulsion is, under certain circumstances, often a more blessed word. The reason for this rule is that if a lawyer undertakes such a suit he becomes personally and financially interested in the result, and may be tempted not to give the court all the aid which is his duty, or may in the end lose the relations of harmony and respect which are indispensable between the court and the lawyers, who are officers of the court and are bound to help Justice duly to balance its scales.

In the same way "champerty" is a legal offence. So, too, no respectable lawyer will give separate advice upon a case which is already in the hands of a colleague. As between advocate and advocate, harmony, courtesy, and the forms of friendship must prevail; and at any time they must in the interest of the client be able to come together and to seize the earliest opportunity of avoiding litigation by compromise or mutual settlement, where it is possible and right. The etiquette of the bar is very strict, and is closely observed.

Legal etiquette is, like medical etiquette, a code of honour and of duty by which the public benefit; and those who depart from it or deride it—"legal shysters"—are not, any more than medical quacks, those of whom their country or their profession have reason to be proud.

I will pass at once to the consideration of our code of medical etiquette. I will ask you to consider whether you are of the opinion that it is safe or wise to cast aside the precedents of past experience and to substitute individual judgment for settled rules. If man were a purely abstract and perfectly moral intelligence, no doubt few words would suffice to legislate for his daily needs. Enough to say, "Do unto others as ye would they should do unto you."

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* From an address delivered before the First Pan-American Medical Congress at Washington, September, 1893. Reprinted from the *British Medical Journal*.

But medical men are not pure creatures of perfect and abstract morality any more than other men. They have, indeed, certain advantages from the outset. From the very beginning of their professional life it is impressed upon them by their teachers that their profession is a mission and not a trade; a mission involving frequent self-sacrifice and a steadfast regard for interests other than their own. In this they are greatly helped by the force of precedent, by the example of those around them and of the leaders whom they most respect. But even these are inadequate. Without the aid of the written as of the unwritten law, even the best of men are apt to decide wrongly in their own favour on a doubtful question of ethics, and often in matters and cases where there are settled instructions in the code which would guide them rightly.

Let me read to you a few of the rules of our College of Physicians, as an example of the conclusions to which many years of observation of the impingement of the forces of modern life on professional duty have led some of our wisest heads. I will refer only to a few as follows:—

"No candidate shall be admitted to examination who refuses to make known, when so required by the president and censors, the nature and composition of any remedy he uses."

"That the practice of medical authors frequently advertising their own works in the non-medical journals, and especially with the addition of laudatory extracts from reviews, is not only derogatory to the authors themselves, but is also injurious to the higher interests of the profession."

"No Fellow, Member, or Licentiate of the College shall officiously, or under colour of a benevolent purpose, offer medical aid to, or prescribe for, any patient whom he knows to be under the care of another doctor."

A further rule prescribes that no physician shall himself assume any special designation of therapeutic method, such as homœopath, electropath, hydropath, or countenance those who do so.

"A physician shall have no interest in a secret medicine, and he shall always, when called upon by the College, disclose every part of the composition of his medicines."

"If it shall at any time hereafter appear, or be made known to the president or censors, that any Fellow or Member of the College has obtained admission into the College, or that any Licentiate of the College has obtained the licence of the College by fraud, false statement, or imposition, or that any Fellow, Member, or Licentiate has been guilty of any great crime or public immorality, or has acted in any respect in a dishonourable or unprofessional manner, or has violated any statute, bye-law, or regulation of the College, relating to Fellows, Members, or Licentiates, as the case may be, the president and censors may call the Fellow, Member, or Licentiate so offending before them, and having investigated the case, may admonish or reprimand him, or inflict a fine; or, if they deem the case of sufficient importance, may report the case to the College, and thereupon a majority of two-thirds may declare such Fellow or Member or Licentiate to be no longer a Fellow, Member, or Licentiate, as the case may be, and his name shall be expunged."

Let us consider now those restrictions which operate to forbid a medical practitioner to consult with "homœopaths," and of which the wisdom has been by some disputed. We do not believe, and we cannot appreciate, the medical capacity or fitness to undertake the treatment of disease of those who hold that drugs which, given internally, will produce certain symptoms of disease are the appropriate remedies for those maladies. For instance, medicines which produce skin reddening for erysipelas; leucorrhine for leucorrhœa; syphiline for syphilis. We do not agree that all chronic maladies arise from syphilis, sycosis, or itch, and that medicines act with an intensity proportionate to the infinite diminution of the dose, or that there is any utility in prescribing, in accordance with these principles, say, a decillionth of a grain, when we all know that a dose so small, if taken by every being on the globe once a minute, would not finish the grain in thousands of years. Nor, again, do we believe that the activity of medicine increases in the ratio of the number of shakes given to the vessel containing it. We hold that we have nothing in common with those who assume to base their practice and theory on this kind of therapeutics. Being well assured that these methods and this theory are absolutely delusive, the negation of reason and the acme of folly, it would be useless, deceptive, and contrary to good faith and the public interest that we should pretend to consult with those who profess them and who take a designation derived from them, and to cover with the respectability of medical science what they are pleased to term their system of treatment. Faith curing it may be, but in that too we can take no part under false pretences.

But then it is said, What if the physician or surgeon of good standing is only called in by the homœopath to assist in diagnosticating the nature, the stage, the complications, or name of the disease? Ought he not to give this help for the patient's sake? The answer is, the physician is a healer, not reader of riddles nor a conner of conundrums. He is there not to give a name to symptoms or pathological conditions, but to heal the patient; and if he knows that his solution of the riddle is not to be followed by a method of treatment which he considers capable of attaining that result, he would be infamously wrong, and he is always wrong when he gives the cover of his accepted position, of his recognised ability, and his professional sanction, to what becomes under such circumstances a dangerous farce or a deliberate fraud. The riddle is read, but the patient is none the better.

But it is said, May a regular medical practitioner not be called in to perform a difficult surgical operation? If a surgical operation meant only cutting, sawing, and sewing, it would be a plausible excuse for the surgeon accepting the responsibility of acting as sawbones to a quack. But there is no surgical operation which does not, in its preliminary stages, and may not, in its various phases and sequels, require concomitant medical consideration and treatment, or in which septic, constitutional, or accidental complications may not arise. The surgeon cannot honourably, in the interest of his client, divest himself of the responsibility for the wise and faithful treatment of these as an essential part of his operative interference.

I have used the word "quack." It is a word often used now in too restricted a sense. This is Dr. Johnson's definition of a quack: "A boasted pretender to arts which he does not understand: a vain, boasting pretender to physic, one who proclaims his own medical abilities in public places; an artful, tricking practitioner in physic." This strikes at the root of the matter now as then. Observe, here is no distinction between those who have degrees and those who have not. The great lexicographer makes no distinction; neither do I.

The essential note of the quack is love of advertisement. The public "places" of Dr. Johnson's time were the coffee-houses; they are now the newspapers. Now, what are the ways in which the diplomaed quack adopts the methods and becomes the imitator, the rival, the accomplice of the undiplomaed? You may know them by their works. They are the gentlemen who put themselves forward to be interviewed, the sham Jupiters and willing Mercuries of the newspaper world. They confide to the ubiquitous reporter what is their opinion of the last new bacillus, the last new antitoxine, or invite reporters to their amphitheatre and hospital ward. All this is only an outcome of the venal desire for advertisement. They are the gentlemen who, if they have the good fortune to attend a prize-fighter, a ballet girl, or the ruler of a State, are not slow to disclose the secrets of the sick room, and all for the public good.

Now, in the venerated oath of Hippocrates, which is the foundation of our code of to-day, the disciple swears to impart the knowledge of his art to others according to the law of medicine and to share with his colleagues by precept and every other mode of instruction all that he knows. He further binds himself that he will have no medical secret, that he will practise his art and pass his life with purity and holiness, that he will abstain from every voluntary act of mischief and corruption, and that whatever in connection with his professional practice he sees or hears in the life of men which ought not to be spoken of abroad he will not divulge. "While I continue to keep this oath inviolated may it be granted to me to enjoy life and the practice of the art respected by all men and in all times. But should I violate this oath may the reverse be my lot."

We have dwelt as long as time will allow on the considerations of public utility and professional duty which oppose consultations with homœopaths and their congeners, nor can I stay long to discuss the prohibition of open advertisement. The advertisement in the lay press of medical books intended for the profession; the submitting of technical books to review; the public criticism of the treatment of any disease or person; the thousand and one acts, in fact, by which the advertising surgeon or physician seeks to gain the ear and favour of the public by means of notoriety or self-proclamation in place of hard, honest work, real professional worth, and the judgment of those whose knowledge makes them alone competent to judge. Self-advertisement is the note of the quack. It is as dangerous to the public as hateful to the profession, for it misleads the masses by substituting easily purchased notoriety for merit, and covering by loud talk, bombast, and plausible pretences the emptiness of the shallow pretender. It covers also with a pseudo-respectability the venal corruption by which whole columns and pages of reading matter of the newspaper are very frequently devoted to quack nostrums and "treatments"—save the mark!—often of the most fantastic, false, and dangerous character. It destroys the landmarks of honour and reticence when in successive numbers of the daily and weekly papers are found the lucubrations of these pests of society, and alongside of them the interviews, the explanations, and the descriptive narratives put forth for the public good by reputable physicians, *àpropos de bottes*, which are but hardly-veiled self-advertisement.

It is, however, only fair that the physician should have notice of the offence or its penalties, and that this salve which he puts to his conscience should be rubbed off. Hence the value of "a code." We have seen that the medical man is prohibited from deriving any profit directly or indirectly from any medicine which he uses or recommends, and from tampering, however remotely, with secret medicines. If this were merely an arbitrary rule, if it were not at least as much for the benefit of the public as well as for the practitioner, there might be ground for calling it in question. But it is a rule of the highest public import.

That a healer, whose judgment in prescribing should be clear and unbiassed, should possess and profit by a secret remedy is as obvious a source of public peril as it is a heinous offence against professional morality. Every physician has a traditional and immemorial right to expect from, and he is bound to give to, his fellow practitioners every possible aid and assistance in the treatment of disease and in the healing of the sick. He has received such knowledge from his predecessors; he daily and continually receives it from his colleagues and contemporaries, to whose knowledge and experience, and from the results of whose investigations, openly stated and submitted to critical discussion, he owes the great bulk of his knowledge and of his ability to practise at all.

A new method of treatment, a new drug, or a new dogma in medicine is like a new doctrine or a dogma in theology. The one is as much a means of physical salvation as the other is of spiritual salvation. The man who keeps either of them to himself as a profitable secret for his own mean gain is a traitor to his profession, he is also a traitor to humanity, and he is false to his mission. It is fitting that the code should provide for such cases, and that the penal clause should not remain a dead letter.

But it is sometimes suggested that the usefulness of the "secret" drug may be so great as to overpower and outweigh morality, and call for its prescription. Is there any foundation for such an assumption in the whole history of medicine? In the whole history of the past can we recall any example of a secret medicine which had ought but the most insignificant value, or could not easily be replaced? We may take even the most famous, such as the notorious remedy of Mrs. Stephen, for dissolving stone in the bladder, for the divulging of which eminent men petitioned Parliament for a grant of £5,000. It was granted, and what do we read of the remedy when divulged? That it consisted of calcined eggshells or of lime obtained by a filthy and obscene process. Naturally, and like all secret remedies when divulged, it ceased to cure. Hartley—the famous Dr. Hartley—one of the most strenuous supporters of the grant, died of stone in the bladder after taking 200 lbs. of the remedy. In our day there is no such thing as a secret remedy in the true or in any other than the trade meaning of the word. We doctors know the composition of all of them. They are secret only to the gullible public to whom they are to be sold. Pain annihilators, blood purifiers, vegetable and animal extracts, botanical nostrums, invigorators, electric belts, amulets and chains, African electrical pills and phials, "green, blue, and yellow electricity"—there is nothing secret about them. When examined in our private or public laboratories they are all found to be commonplace in composition, or if they have anything not well worn in use, it is merely the name of some indifferent or trivial matter—Indian grass or African leaf added, most often and chiefly, for the sake of novelty. These secrets are trade devices, with which we are not concerned. Let us visit those physicians who dabble in them with the severity of the code. I do not think that is asking more than is due to the honour of the professional body and the welfare of the public.

In respect then of secret medicines, at least, the world has up to this date lost nothing by the stern and scornful disapproval with which the medical profession regards these tricky nostrums, and by the punishment with which they visit, and always ought to visit, those who sell the honour of their calling and the free communication of medical knowledge which is the birthright of mankind for some mess of commercial pottage.

## AN IMPROVED TEST FOR ARSENIATES.

BY JOHN LOTHIAN,

*Pharmaceutical Chemist.*

This will be found an expeditious method for demonstrating the presence of arsenic, when existing in the arsenic condition, and has been used by the author for upwards of five years. It is especially applicable to insoluble arseniates, *e.g.*, $Fe_32AsO_4$, in which case the pharmacopœial test is tedious and unreliable, *viz.*, boiling with excess of caustic alkali, neutralising, and testing with $AgNO_3$. The substance is dissolved in dilute HCl, or if soluble acidulated with dilute HCl, $Na_2S_2O_3$ added, the solution warmed, and $H_2S$ gas passed in. Yellow arsenious sulphide is at once precipitated. The sulphur thrown out from the $Na_2S_2O_3$ does not interfere with the reaction, and may, if necessary, be removed by agitation with carbon bisulphide.

## THE FLORA OF THE PHILIPPINE ISLANDS.

There is a great absence of flowering plants, and those which do flower have, as a rule, very small blossoms, and the absence of odorous flowers is as remarkable as the absence of singing birds. Flowering orchids are abundant both in variety and numbers in the forests, but in the towns, a fair-sized plant of an ordinary species cannot be procured under about 3*s.* By the roadside, near Manila, the principal trees to be seen are the tall and graceful betel-nut palm, bamboo, bananas, and other tropical trees and plants. Vegetables—beans and peas, for example—are grown by covering them up and protecting them from the sun by trellis work, covered with banana and other leaves, but most of the vegetables are brought from Hong-Kong. There is hardly any edible fruit but mangoes and pine-apples, the latter growing as commonly as weeds. The sugar-cane, coffee-plant, abaca or hemp, tobacco, maize, and rice, are the plants chiefly cultivated. As for the woods of the country, their nomenclature forms an immense list, and the better kinds of wood are too little known. Some of the woods are excellently suited for furniture, especially the "narra" wood, which has the appearance of mahogany, but is not so close in grain, while having a lighter colour.—*Consular Report.*

## HOMERIA COLLINA.

In a recent report to the Department of Agriculture, Victoria, Mr. D. McAlpine, Government Vegetable Pathologist, has directed attention to the poisonous action of a bulbous plant which has been identified as *Homeria collina*, var. *miniata.* It is a native of the Cape of Good Hope, where it is commonly known as "Tulp," or Cape Tulip. It is not, however, a true tulip, but belongs to the *Iridaceæ*, and is sometimes described under the name of *Moræa collina.* It has a very attractive appearance, but is a most dangerous plant to cultivate, as it spreads rapidly by means of its bulbils. These are formed in clusters in the axil of each of its long grassy leaves, and resemble the head of *Allium vineale* in appearance. A number of cattle died within twenty-four hours after eating the leaves at Pascoe Vale, a suburb of Melbourne, where the plant appears to have become naturalised, and children have occasionally been poisoned by it. It appears to be an irritant poison, causing intense gastritis, extending through the whole course of the small intestines, and causes great venous congestion of the brain. The curious feature in the action of the poison appears to be that the nausea, vomiting, great pain, and prostration of strength are accompanied by constipation. The active principle does not seem to be alkaloidal in character, since no trace of an alkaloid could be detected by the ordinary alkaloidal reagents.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, OCTOBER 28, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## PHARMACEUTICAL ORGANISATION.

We have been favoured with an advance copy of a circular that is being addressed to the presidents of local pharmaceutical associations, by the committee appointed at Nottingham last August to carry out the resolution then passed, with the object of promoting the federation of such associations, and with a view to effecting in regard to policy and practice greater unity among pharmacists, which would be conducive to better protection of their trade interests. It is pointed out that by the union of existing associations and such new ones as may be formed in response to the stimulus now being given, much more of advantage to pharmacists may be effected than under the present system of isolation. Accordingly, it is proposed that an Executive Committee be appointed, upon which each local association in Great Britain shall be represented by a delegate having full power to act and vote for the association he is deputed by. It is proposed that an annual meeting should be held, at the same time and place as the British Pharmaceutical Conference, to discuss matters pertaining to the welfare of pharmacy, and to make the necessary arrangements for the better carrying on of the work of Federation. The associations addressed, through their representatives, are requested to co-operate on the lines laid down, to offer suggestions, and, if favourable to the project, at once appoint delegates to act with the Committee.

It is somewhat remarkable that, in the current issue of the *Bulletin de la Société Royale de Pharmacie de Bruxelles*, the chief place should be occupied by a sympathetic article on this very subject of "co-operative organisation" in pharmacy, contributed by M. J. BRENGELMANS. We gather from this that pharmaceutical organisation in Belgium is in no better plight than in Great Britain. The same lack of union, the same apathy and wilful blindness to the best interests of pharmacy as a profession, are depicted in terms that have long been familiar in the mouths of those who, from time to time, have striven to rouse British pharmacists from the state of lethargy which seems to have become almost chronic with them. Singularly enough, too, the Belgian writer has been struck with the idea that if all who are inspired with hope of the ultimate salvation of their fellow pharmacists could be induced to join forces, and above all to undergo a certain degree of discipline, serviceable in promoting the general welfare of the body, they might be able, in a brief time, to remedy matters. Co-operation, it is pointed out, is the modern tendency on every hand, and pharmacists are urged to aid in the general movement and so benefit themselves. The solution of existing difficulties proposed runs on lines almost identical with those advocated by Mr. THOMPSON and the Committee which has been formed to second his well-meant efforts, consisting in the formation of sectional groups which shall send delegates to a congress representative of all the pharmacists in the country. M. BRENGELMANS, like his English collaborator, is convinced of the notable moral and material advantages likely to result if such a scheme could be realised.

Without desiring in any way to oppose check or hindrance to labours having the highly laudable object of the federation of pharmacists, it may be pointed out that a legally constituted representative body already exists in this country, which possesses exceptional advantages in regard to the object in view. Whether the fact be acknowledged or not, it remains none the less real that the Pharmaceutical Society of Great Britain, as the legally constituted qualifying body, represents the whole mass of British pharmacists. The reasons that prompt a majority of those so represented to abstain from closer participation in the labours and privileges of the Society are, doubtless, many and varied, though none deserve the prolonged consideration of reasonable men. Individuals who will refuse to strengthen their own position, from the public point of view, because of fancied slights, a false economy which glories in the thrift that saves less than one penny daily, an innate distaste to acknowledge duly constituted authorities even when founded upon an extremely democratic basis, an objection to some detail in the methods and procedure of the Society, or because of positive apathetic carelessness, are perhaps to be regarded as weak reeds, whose support may with advantage be dispensed with. If, however, lack of conviction, rather than mere perversion, should be keeping many aloof from co-operation with their fellows, it is to be hoped that the clearer light which may be afforded by the suggestion of this federation scheme will ultimately result in the reinforcement of the only body capable by its constitution of permanently benefiting British pharmacists.

The circumstance that the VICE-PRESIDENT of the Pharmaceutical Society is the Chairman of the *interim* Committee appointed at Nottingham, may be taken as an assurance that the view above put forward will meet with due consideration. What more efficient form of federation can be imagined than the formation of branches of the Pharmaceutical Society on the same basis as that which has rendered such excellent service in Scotland? What better mode could there be of obtaining due representative consideration of matters affecting the business interests of pharmacists than co-operating with the central organisation, and if need be having periodical meetings for that purpose to which accredited delegates from such branches could be sent to take part in the decision of any questions that may arise? A system of that kind is now being brought into operation by the German Apotheker-Verein, which has for years past had numerous branches throughout the whole of the country engaged, to a certain extent independently, in doing work for the benefit of these several localities, and thus been enabled to secure due representation at the general meetings. Such an arrangement appears adapted to furnish a true territorial representation of pharmaceutical interests and to offer the best means of providing for them comprehensively.

### SALE OF INSECT POWDER.

We understand that a number of prosecutions have been instituted at Edinburgh, against chemists and druggists, for supplying ordinary insect-powder when a proprietary article was asked for. The sale is said to be mostly in pennyworths, and the respondent in one case, that came before the Court of Session on Tuesday last, alleges in his published defence that the proceedings against him "are ruinous and oppressive, wholly unwarranted by the facts, and are merely a device got up for advertising purposes." In this case an *interim* interdict was granted upon caution being found. It seems pretty clear that certain chemists have laid themselves open to annoyance in this matter by what cannot be described otherwise than as culpable negligence. Knowing that the proprietary preparation is not purchasable in small quantities, they have, to save trouble, avoided the necessity of explaining this fact in numerous instances, and have supplied what, doubtless, they had good reason to suppose was required, but not what was asked for by the purchaser. It seems desirable, therefore, to caution chemists against unwittingly infringing the law in this respect. Those affected would probably be amongst the last people in the world to wilfully set themselves to attempt to reap the reward of others' labours, and it behoves them, for the sake of their professional reputation, to abstain from acting in a manner that may appear even infinitesimally prejudicial to the interests of other persons.

### TOXINS AND ANTITOXINS.

It is stated by Dr. Kanthack, in the *Medical Chronicle*, that the specific action of pathogenic bacteria has been shown, during the past few years, to be due to toxalbumins instead of ptomaines or poisonous bases, as was formerly supposed, and it was assumed that these toxalbumins were formed from albuminous substances existing in the body, as a result of the activity of bacteria. They are considered by Buchner (*Münch. med. Wochen.*), however, to be direct products of bacterial cells, and he has proved this in the case of tetanus, by growing the bacillus on a solution of asparagin. Since asparagin cultures produced the typical tetanic lesion in animals, it seemed clear that the toxalbumin formed must have been derived directly from the bacterial plasma. Though no toxalbumins have yet been separated in a pure state, they are known to react like the enzymes and so-called alexins or protective proteids. In a moist condition, they are generally destroyed by a temperature of 55° C. to 70° C., though resisting much higher temperatures when in a dry state, whilst neutral salts, such as the sulphates of alkaline bases, which limit the action of water, will also increase the resistance. Buchner further suggests that antitoxins, as well as toxins, are probably bacterial products. Antitoxins act by establishing in animals immunity to specific diseases. They appear to remain stored up in the organism after the toxins have been rendered harmless, even when administered in the exact proportion to effect neutralisation of the latter. Probably, therefore, toxins and antitoxins do not react directly on each other, and the latter, acting by immunisation, have no direct curative action.

### ALUMNI REPORT.

The monthly organ of the Alumni Association of the Philadelphia College of Pharmacy inaugurates the thirtieth year of its publication by appearing in a new guise, on larger paper. It is edited by Joseph W. England, Ph.G., and the majority of its readers are members of the Alumni Association, to recording the social doings and interests of which it is chiefly devoted. The first number of the new volume has an excellent portrait of the late John M. Maisch as a frontispiece, and also contains an interesting biographical notice of the deceased professor. His place as Professor of Materia Medica and Botany in the College has been filled by the appointment of Edson S. Bastin, A.M., Professor of Botany and Pharmacognosy in the School of Pharmacy in connection with the Northwestern University, Chicago.

### EVENING MEETING IN LONDON.

The first evening meeting of the Pharmaceutical Society for the session will be held at 17, Bloomsbury Square, on Wednesday, November 8, when a "Note on Manna Collection in Sicily" will be contributed by Mr. John Slinger Ward, and "Certain Spurious Drugs recently Imported" will be dealt with by Professor Greenish.

### MIDLAND PHARMACEUTICAL ASSOCIATION.

The first meeting of this Association for the present session will be held at the Grand Hotel, Colmore Row, Birmingham, on Thursday, November 2, at 8.15 p.m. An address will be delivered by Mr. Charles Symes, Ph.D., and we are requested to state that anyone connected with the trade will be free to attend the meeting. Tickets of admission may be obtained by application to the Honorary Secretary, Mr. T. W. Lowther, Moseley.

# Transactions of the Pharmaceutical Society.

## FIRST EXAMINATION.

A meeting of the Board of Examiners for England and Wales was held on Tuesday, the 24th inst.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Brackenbury, Walter Robert | Eardney. |
| Hoskins, Joseph Stanley | Penzance. |
| May, Joseph T. | Leyton. |
| Scupham, Frederick Henry | Market Rasen. |
| Woodward, Robert | Old Newton. |

The Report of the College of Preceptors on the Examination held on the 10th inst. was received.

*Two hundred and ninety-nine* candidates had presented themselves for examination, of whom *one hundred and fifty* had failed.

The following *one hundred and forty-nine* passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students:—

| | |
|---|---|
| Adamson, John | Tottenham. |
| Albery, Henry William | Plumstead. |
| Aldridge, Ernest | Shepherd's Bush. |
| Allan, George | Aberdeen. |
| Anderson, Wallace H. Jackson | Harlesden. |
| Anderson, William | Dunfermline. |
| Appleton, John Thompson | Sheffield. |
| Ashton, Charles Henry | St. Helens. |
| Barritt, Percy | Norwich. |
| Battersby, Wm. Eckersley | Westhoughton. |
| Bell, Beaupré | Wisbech. |
| Bennett, William Chaplin | Bristol. |
| Beveridge, Charles Ernest | New Brompton. |
| Bice, Frederick Malachi | Louth. |
| Billington, Samuel P. | Huddersfield. |
| Birchall, Fred | Preston. |
| Blake, William | Galashiels. |
| Blyton, John Henry | Manchester. |
| Bonner, James | Annan. |
| Booth, John H. | Huntly. |
| Boyd, Thomas | Glasgow. |
| Brewer, Philip James | Deal. |
| Brown, George Arthur | Bishop Auckland. |
| Brumpton, John William | Lincoln. |
| Campbell, James | Falkirk. |
| Chalmers, William T. | Hamilton. |
| Chambers, Fred Aldis | Liverpool. |
| Cherry, Frederick | Bloxham. |
| Clark, William Donald | Leeds. |
| Cleaver, Samuel Ernest | Leicester. |
| Clowes, William | Cheddleton. |
| Clunas, John | Nairn. |
| Coates, Harold Kinsella | Waterloo. |
| Cocking, Harold Holland | Rotherham. |
| Cooper, Thomas | Runcorn. |
| Courtenay, Edward | Shrewsbury. |
| Curry, George | Coldstream. |
| Cutcliffe, Charles | Dawlish. |
| Dale, Frederick | Old Basford. |
| Davie, John S. | Alexandria. |
| Davies, David Morgan | Ammanford. |
| Dewhirst, John Arthur | Halifax. |
| Downing, Alfred | Plymouth. |
| Duncan, James Greenhill | Portobello. |
| Dunsire, Robert | Kirkcaldy. |
| Elliott, William Gray | Penrith. |
| Evans, Arthur Wm. John | Maindee. |
| Evans, Edgar Lewis | Cardiff. |
| Evans, John Owen | Portmadoc. |
| Ferguson, John Douglas | Brighouse. |
| Fitzgerald, John Charlton | Doncaster. |
| Gaskin, Charles | Cricklewood. |
| Gillis, Adolphus | Sunderland. |
| Goundry, Edward Robert | Cardiff. |
| Gregson, William Charles | Blackburn. |
| Grieve, John | Edinburgh. |
| Griffiths, Edwin | Kidsgrove. |
| Gross, Geo. Franklin Cooper | Barrow-in-Furness. |
| Gyles, Emily | Clapham. |
| Hacker, George Apthorpe | Cheltenham. |
| Halewood, John Henry | Southport. |
| Hall, Lennox Harper | Macduff. |
| Hall, Walter Hutchinson | Littleborough. |
| Hambling, Jane | Birmingham. |
| Hardisty, John Henry | Ilkley. |
| Hatfield, Aubrey Haley | York. |
| Heywood, Frederick | Preston. |
| Hodgkinson, Ethel | Tottenham. |
| Hooper, Richard John | Wood Green. |
| Howden, Joseph T. | York. |
| Irving, George | Annan. |
| Jeanes, Richard | Weymouth. |
| Jenkins, George Frederic | Cardiff. |
| Jones, George Maurice | Birmingham. |
| Jones, Robert Ward | Louth. |
| Keeley, George Richard | Croydon. |
| Keeton, William Henry | Mansfield. |
| Killick, Herbert James | London. |
| King, Alfred | Leicester. |
| King, Arthur Edward | Norwich. |
| Lewis, Thomas Frederick | Brierley Hill. |
| Low, William Arthur | Gloucester. |
| McAdam, Alexander Milne | Glasgow. |
| McCune, William | Kilwinning. |
| McKinnel, John | Glasgow. |
| Maclees, John Prentice | Wishaw. |
| Mallinson, Cuthbert Septimus | Brondesbury. |
| Manson, Thomas | St. Andrews. |
| Measday, Charles Stafford | Deal. |
| Melling, Alfred Ernest | Ashton-in-Makerfield. |
| Middleton, John George | So. Norwood. |
| Milligan, William Robert | Newcastle-on-Tyne. |
| Mills, Edward Francis | St. Leonards. |
| Milne, Joseph | Aberdeen. |
| Milne, Thomas | Aberdeen. |
| Milner, William Craven | Gainsborough. |
| Mitton, Thomas John Lowe | Huddersfield. |
| Moore, William | Seedley. |
| Nicol, George | Aberdeen. |
| Noble, Harry William | Manningham. |
| Parker, William Shepherd | Carlisle. |
| Parr, Leonard Thomas Wm. | Birkenhead. |
| Percival, Thomas Henry | Walthamstow. |
| Perrott, David John | Burry Port. |
| Piggin, Leonard William | Tunstall. |
| Pool, Robert | Annan. |
| Pratt, Augustus William | Dudley. |
| Redman, Stanley Charles | London. |
| Rees, Arthur Howell | Neath. |
| Rees, David Edward | Llandilo. |
| Rees, James David | Fishguard. |
| Richardson, Robert | Blackburn. |
| Robinson, John George | West Hartlepool. |
| Rowe, William Alfred | Colwyn Bay. |
| Ruoff, Francis Hermann | Reading. |
| Scaife, Samuel Barnes | Manchester. |
| Scholefield, Samuel Geo. C. | Bingley. |
| Scott, James Weir | Leith. |
| Senter, John Watt | Kildrummy. |
| Sime, William | Dundee. |
| Skelton, Tom | Silloth. |
| Skinner, Grahame Howie | Leith. |
| Sonley, Walter | Littleborough. |
| Stewart, James Lawson | Carluke. |
| Stringer, Horace | Barnsley. |
| Stuart, John Miller Gordon | Dufftown. |

| | |
|---|---|
| Thexton, Thomas Alfred | Kendal. |
| Thompson, Edwin | York. |
| Thompson, Edwin George | Bury. |
| Thomson, Thomas | Forfar. |
| Thorpe, Frank Evington | Long Eaton. |
| Toon, Arthur | Earl's Shilton. |
| Traylen, Charles Leonard | Leicester. |
| Walker, Alexander Carnegie | Aberdeen. |
| Walker, James | Helensburgh. |
| Walsham, William | Gedney. |
| Watson, Edward Alexander | East Wemyss. |
| Watt, Edward William | Guisborough. |
| Webb, Ernest George | Bristol. |
| White, Edgar Charles | Cheltenham. |
| White, Thomas William | Stirling. |
| Whitworth, Arthur Upsall | Sleaford. |
| Williams, John Hancock | Llanstephan. |
| Wilson, Ernest Joseph | Southsea. |
| Wilson, Joseph Edward | Bath. |
| Winchester, George | Egremont. |
| Woodhead, Alfred Ernest | Eaglescliffe. |
| Yates, Thomas | Cradley Heath. |
| Young, James Paton | Alva. |

The questions set at this examination were published in the *Pharmaceutical Journal* for October 14, p. 312.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

| | Candidates. | | |
|---|---|---|---|
| | Examined. | Passed. | Failed. |
| Aberdeen | 13 | 9 | 4 |
| Aberystwith | 1 | 0 | 1 |
| Birmingham | 16 | 6 | 10 |
| Brighton | 1 | 0 | 1 |
| Bristol | 8 | 3 | 5 |
| Cambridge | 2 | 0 | 2 |
| Canterbury | 3 | 2 | 1 |
| Cardiff | 11 | 5 | 6 |
| Carlisle | 14 | 5 | 9 |
| Carmarthen | 7 | 5 | 2 |
| Carnarvon | 5 | 2 | 3 |
| Cheltenham | 4 | 3 | 1 |
| Darlington | 10 | 4 | 6 |
| Dundee | 8 | 3 | 5 |
| Edinburgh | 21 | 10 | 11 |
| Exeter | 1 | 1 | 0 |
| Glasgow | 21 | 12 | 9 |
| Hull | 4 | 0 | 4 |
| Inverness | 2 | 1 | 1 |
| Lancaster | 7 | 5 | 2 |
| Leeds | 14 | 10 | 4 |
| Lincoln | 8 | 5 | 3 |
| Liverpool | 18 | 8 | 10 |
| London | 30 | 17 | 13 |
| Manchester | 24 | 10 | 14 |
| Newcastle-on-T. | 2 | 2 | 0 |
| Norwich | 6 | 2 | 4 |
| Nottingham | 11 | 6 | 5 |
| Oxford | 1 | 1 | 0 |
| Penzance | 1 | 0 | 1 |
| Peterborough | 3 | 2 | 1 |
| Plymouth | 2 | 1 | 1 |
| Sheffield | 8 | 3 | 5 |
| Shrewsbury | 4 | 1 | 3 |
| Southampton | 4 | 2 | 2 |
| York | 4 | 3 | 1 |

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting was held at 103, Great Russell Street, on Thursday, October 19, the President, Mr. E. F. Harrison, in the chair. After the Secretary had read the minutes, the President called upon Mr. W. Lloyd Williams, F.I.C., to read his paper, entitled "A Pharmacist's Holiday." This gave an interesting account of a pedestrian excursion from Malvern to Aberystwith during the early days of June last, the route taken being through Ledbury, Hereford, St. Devereux, Kilpeck, Abbey Dore, Vowchurch, Peterchurch, Dorstone, Westbrook, Hay, Paincastle, Newchurch, Huntington, Kington, Old and New Radnor, Llandrindod Wells, Newbridge-on-Wye, Rhayader, and Devil's Bridge. Reference was made to matters of antiquarian and botanical interest, noted by the way, and a brief description was given of the arrangements made for converting the valley through which flow the rivers Elan and Claerwen, tributaries of the Wye, into a huge reservoir, similar to that at Vrwyney, for supplying Birmingham with water.

The paper was illustrated by lantern slides with views of the places visited, which afforded additional interest to the paper, as did also the photographs and botanical specimens exhibited by Mr. Williams.

The President, at the conclusion of the paper, remarked that the way in which Mr. Williams had gathered information was most thorough, for he had taken not any one or two subjects, but had dipped into architecture, history, botany, philology, and archeology, and not only were these notes of value, but the general principle of taking a holiday in such a way was to be commended; he certainly thought it was a lesson for the members to go and do likewise next year, and that men would be all the better for having some hobby to take up when away for their holiday.

Mr. Robins and Mr. Hill also spoke, and Mr. Sage congratulated Mr. Williams upon the manner in which he had collected facts as he went along. He asked whether he had made use of a note book; and referred also to the rarity of some of the botanical specimens exhibited.

Mr. Williams replied in a few words, and said that the evening had added another pleasant hour to those spent during his holiday; he had resorted to a note book, which he took everywhere with him.

# Provincial Transactions.

## EAST ABERDEENSHIRE CHEMISTS' ASSOCIATION.

A meeting was held at Maud on Wednesday, October 18, a notice to attend the meeting having been sent by the Local Secretary of the Peterhead district to each registered person in the district. There was a good attendance, and Mr. G. McGregor was called to the chair. After some letters of apology had been read, it was unanimously agreed that Mr. Tocher, Peterhead, should be re-nominated as Local Secretary for 1894. Mr. Tocher then moved that the East Aberdeenshire Chemists' Association, with Mr. Geo. McGregor as President, be resuscitated, and that the members of the Association comprise those within the Peterhead district, as defined in the Pharmaceutical Society's recent circular to local secretaries. Mr. Hardie (Old Deer) seconded, and Mr. Lee (Strichen) supported the motion, which was cordially agreed to. Afterwards several matters of interest were discussed.

## BRIGHTON JUNIOR ASSOCIATION OF PHARMACY.

The fourth annual dinner of this Association was held at the Café Royal, East Street, on Wednesday, October 18. During the evening prizes were presented to the successful candidates for herbaria collected during the year, as follows:—1st, Mr. C. Kent (Remington's 'Pharmacy,' presented by Mr. W. D. Savage); 2nd, Mr. Snow (presented by Mr. Gwatkin); 3rd, Mr. Bridgewood (presented by Mr. Histed). Messrs. Savage and Gwatkin have each offered another prize for this year for the best collections of medicinal indigenous plants included in any Pharmacopœia of the present century. Messrs. Gibson and W. W. Savage also offered two prizes, open to the apprentices of Brighton, the subject to be left to the Committee of the Junior Association to fix. Subsequently, Messrs. Gibson, Savage, and the President made earnest appeals for the Benevolent Fund. The President decided to have a box made for collections at the Junior meetings, and Mr. Parrish started the list with £1 1*s*. subscription. Messrs. Gibson and Savage also promised financial help.

# The British Association for the Advancement of Science.

## ADDRESS TO THE BIOLOGICAL SECTION.

BY REV. H. B. TRISTRAM, M.A., LL.D., D.D., F.R.S., PRESIDENT OF THE SECTION.

(*Continued from page* 338.)

But the scope of field observation does not cease with geographical distribution and modification of form. The closest systematist is very apt to overlook or to take no count of habits, voice, modification, and other features of life which have an important bearing on the modification of species. To take one instance, the short-toed lark (*Caladrella brachydactyla*) is spread over the countries bordering on the Mediterranean; but, along with it, in Andalusia alone is found another species, *Cal. bætica*, of a rather darker colour, and with the secondaries generally somewhat shorter. Without further knowledge than that obtained from a comparison of skins, it might be put down as an accidental variety. But the field naturalist soon recognises it as a most distinct species. It has a different voice, a differently shaped nest; and, while the common species breeds in the plains, this one always resorts to the hills. The Spanish shepherds on the spot recognise their distinctness and have a name for each species, Take, again, the eastern form of the common song-thrush. The bird of North China, *Turdus auritus*, closely resembles our familiar species, but is slightly larger, and there is a minute difference in the wing formula. But the field naturalist has ascertained that it lays eggs like those of the misselthrush, and it is the only species closely allied to our bird which does not lay eggs of a blue ground colour. The hedge accentor of Japan (*Accentor rubidus*) is distinguished from our most familiar friend, *Accentor modularis*, by delicate differences of hue. But, though in gait and manner it closely resembles it, I was surprised to find the Japanese bird strikingly distinct in habits and life, being found only in forest and brushwood several thousand feet above the sea. I met with it at Chinsenze—6000 feet—before the snow had left the ground, and in summer it goes higher still, but never descends to the cultivated land. If both species are derived, as seems probable, from *Accentor immaculatus* of the Himalayas, then the contrast in habits is easily explained. The lofty mountain ranges of Japan have enabled the settlers there to retain their original habits, for which our humbler elevations have afforded no scope.

On the solution of the problem of the migration of birds, the most remarkable of all the phenomena of animal life, much less aid has been contributed by the observations of field naturalists than might reasonably have been expected. The facts of migration have, of course, been recognised from the earliest times, and have afforded a theme for Hebrew and Greek poets 3000 years ago. Theories which would explain it are rife enough, but it is only of late years that any systematic effort has been made to classify and summarise the thousands of data and notes which are needed in order to draw any satisfactory conclusion. The observable facts may be classified as to their bearing on the whither, when, and how of migration, and after this we may possibly arrive at a true answer to the Why? Observation has sufficiently answered the first question, Whither.

There are scarcely any feathered denizens of earth or sea to the summer and winter ranges of which we cannot now point. Of almost all the birds of the holoarctic fauna, we have ascertained the breeding-places and the winter resorts. Now that the knot and the sanderling have been successfully pursued even to Grinnell Land, there remains but the curlew sandpiper (*Tringa subarquata*), of all the known European birds, whose breeding ground is a virgin soil, to be trodden, let us hope, in a successful exploration by Nansen, on one side or other of the North Pole. Equally clearly ascertained are the winter quarters of all the migrants. The most casual observer cannot fail to notice in any part of Africa, north or south, west coast or interior, the myriads of familiar species which winter there. As to the time of migration, the earliest notes of field naturalists have been the records of the dates of arrival of the feathered visitors. We possess them for some localities, as for Norfolk by the Marsham family, so far back as 1736. In recent years these observations have been carried out on a larger and more systematic scale, by Middendorff, who, forty years ago, devoted himself to the study of the lines of migration in the Russian Empire, tracing what he called the *isopipteses*, the lines of simultaneous arrival of particular species, and by Professor Palmén, of Finland, who, twenty years later, pursued a similar course of investigation; and by Professor Baird on the migration of North American birds; and subsequently by Severtzoff as regards Central Asia, and Menzbier as regards Eastern Europe. As respects our own coasts, a vast mass of statistics has been collected by the labours of the Migration Committee appointed by the British Association in 1880, for which our thanks are due to the indefatigable zeal of Mr. John Cordeaux, and his colleague Mr. John Harvie Brown, the originators of the scheme by which the lighthouses were for nine years used as posts of observation on migration. The reports of that Committee are familiar to us, but the inferences are not yet worked out. I cannot but regret that the Committee has been allowed to drop. Professor W. W. Cooke has been carrying on similar observations in the Mississippi valley, and others, too numerous to mention, have done the same elsewhere. But, as Professor Newton has truly said, All these efforts may be said to pale before the stupendous amount of information amassed during more than fifty years by the venerable Herr Gätke, of Heligoland, whose work we earnestly desire may soon appear in an English version.

We have, through the labours of the writers I have named, and many others, arrived at a fair knowledge of the When? of migration. Of the How? we have ascertained a little, but very little. The lines of migration vary widely in different species, and in different longitudes. The theory of migration being directed towards the magnetic pole, first started by Middendorff, seems to be refuted by Baird, who has shown that in North America the theory will not hold. Yet, in some instances, there is evidently a converging tendency in northward migrations. The line, according to Middendorff, in Middle Siberia is due north, in Eastern Siberia S.E. to N.W., and in Western Siberia from S.W. to N.E. In European Russia, Menzbier traces four northward routes: (1) A coast line coming up from Norway round the North Cape to Nova Zembla. (2) The Baltic line with bifurcation, one proceeding by the Gulf of Bothnia, and the other by the Gulf of Finland, which is afterwards again subdivided. (3) A Black Sea line, reaching nearly as far north as the valley of the Petchora, and (4) the Caspian line, passing up the Volga and reaching as far east as the valley of the Obi by other anastomosing streams.

Palmén has endeavoured to trace the lines of migration on the return autumnal journey in the eastern hemisphere, and has arranged them in nine routes: (1) From Nova Zembla, round the West of Norway, to the British Isles. (2) From Spitzbergen, by Norway, to Britain, France, Portugal, and West Africa. (3) From North Russia, by the Gulf of Finland, Holstein, and Holland, and then bifurcating to the West

Coast of France on the one side, and on the other up the Rhine to Italy and North Africa. (4 *a*) Down the Volga by the Sea of Azov, Asia Minor, and Egypt, while the other portion (4 *b*), trending east, passes by the Caspian and Tigris to the Persian Gulf. (5) By the Yenesei to Lake Baikal and Mongolia. (6) By the Lena on to the Amoor and Japan. (7) From East Siberia to the Corea and Japan. (8) Kamschatka to Japan and the Chinese Coast. (9) From Greenland, Iceland, and the Faroes, to Britain, where it joins line 2.

All courses of rivers of importance form minor routes, and consideration of these lines of migration might serve to explain the fact of North American stragglers, the waifs and strays which have fallen in with great flights of the regular migrants and been more frequently shot on the east coast of England and Scotland than on the west coast or in Ireland. They have not crossed the Atlantic, but have come from the far north, where a very slight deflection east or west might alter their whole course, and in that case they would naturally strike either Iceland or the west coast of Norway, and in either case would reach the east coast of Britain. But, if by storms and the prevailing winds of the North Atlantic, coming from the west, they had been driven out of their usual course, they would strike the coast of Norway, and so find their way hither in the company of their congeners.

As to the elevation at which migratory flights are carried on, Herr Gätke, as well as many American observers, holds that it is generally far above our ken, at least in normal conditions of the atmosphere, and that the opportunities of observation, apart from seasons and unusual atmospheric disturbances, are confined chiefly to unsuccessful and abortive attempts. It is maintained that the height of flight is some 1,500 to 15,000 feet, and if this be so, as there seems every reason to admit, the aid of land bridges and river valleys becomes of very slight importance. A trivial instance will illustrate this. There are two species of blue-throat, *Cyanecula suecica* and *C. leucocyana*; the former with its red breast patch is abundant in Sweden in summer, but is never found in Germany, except most accidentally, as the other is the common form of Central Europe. Yet both are abundant in Egypt and Syria, where they winter, and I have, on several occasions, obtained both species out of the same flock. Hence we infer that the Swedish bird makes its journey from its winter quarters with scarcely a halt, while the other proceeds leisurely to its nearer summer quarters. On the other hand, I have more than once seen myriads of swallows, martins, sand-martins, and, later in the season, swifts, passing up the Jordan Valley and along the Bukoa of Central Syria, at so slight an elevation that I was able to distinguish at once that the flight consisted of swallows or house-martins. This was in perfectly calm clear weather. One stream of swallows, certainly not less than a quarter of a mile wide, occupied more than half an hour in passing over one spot, and flights of house-martins, and then of sand-martins, the next day, were scarcely less numerous. These flights must have been straight up from the Red Sea, and may have been the general assembly of all those which had wintered in East Africa. I cannot think that these flights were more than 1,000 feet high. On the other hand, when standing on the highest peak in the Island of Palma, 6,500 feet, with a dense mass of clouds beneath us, leaving nothing of land or sea visible, save the distant Peak of Teneriffe, 13,000 feet, I have watched a flock of Cornish choughs soaring above us, till at length they were absolutely undistinguishable by us except with field-glasses.

As to the speed with which the migration flights are accomplished, they require much further observation. Herr Gätke maintains that godwits and plovers can fly at the rate of 240 miles an hour (!), and the late Dr. Jerdon stated that the spine-tailed swift (*Acanthyllis caudacutus*), roosting in Ceylon, would reach the Himalayas (1,200 miles) before sunset. Certainly in their ordinary flight the swift is the only bird I have ever noticed to outstrip an express train on the Great Northern Railway.

Observation has shown as that, while there is a regular and uniform migration in the case of some species, yet that, beyond these, there comes a partial migration of some species, immigrants and emigrants simultaneously, and this, besides the familiar vertical emigration from higher to lower altitudes and *vice versâ*, as in the familiar instance of the lapwing and golden plover. There is still much scope for the field naturalist in observation of these partial migrations. There are also species in which some individuals migrate and some are sedentary, *e.g.*, in the few primeval forests which still remain in the Canary Islands, and which are enshrouded in almost perpetual mist, the woodcock is sedentary, and not uncommon. I have often put up the bird and seen the eggs; but in winter the number is vastly increased, and the visitors are easily to be distinguished from the residents by their lighter colour and larger size. The resident never leaves the cover of the dense forest, where the growth of ferns and shrubs is perpetual, and fosters a moist, rich, semi-peaty soil, in which the woodcock finds abundant food for all the year, and has thus lost its migratory instincts.

But why do birds migrate? Observation has brought to light many facts which seem to increase the difficulties of a satisfactory answer to the question. The autumnal retreat from the breeding quarters might be explained by a want of sufficient sustenance as winter approaches in the higher latitudes, but this will not account for the return migration in spring, since there is no perceptible diminution of supplies in the winter quarters. A friend of mine, who was for some time stationed at an infirmary at Kikombo, on the high plateau south-east of Victoria Nyanza Lake, almost under the Equator, where there is no variation in the seasons, wrote to me that from November to March the country swarmed with swallows and martins, which seemed to the casual observer to consist almost wholly of our three species, though occasionally a few birds of different type might be noticed in the larger flocks. Towards the end of March, without any observable change in climatic or atmospheric conditions, nine-tenths of the birds suddenly disappeared, and only a sprinkling remained. These, which had previously been lost amid the myriad of winter visitants, seemed to consist of four species, of which I received specimens of two, *Hirundo puella* and *H. senegulensis*. One, described as white underneath, is probably *H. æthiopica*; and the fourth, very small, and quite black, must be a *Psalidoprocne*. All these remained through spring and summer. The northward movement of all the others must be through some impulse not yet ascertained. In many other instances observation has shown that the impulse of movement is not dependent on the weather at the moment. This is especially the case with sea birds. Professor Newton observes they can be trusted as the almanack itself. Foul weather or fair, heat or cold, the puffins, *Fratercula arctica*, repair to some of their stations punctually on a given day, as if their movements were regulated by clockwork. In like manner, whether the summer be cold or hot, the swifts leave their summer home in England about the first week in August, only occasional stragglers ever being seen after that date. So in three different years I noticed the appearance of the common swift (*Cypselus apus*) in myriads on one day in the first week in April. In the case of almost all the land birds, it has been ascertained by repeated observations that the male birds arrive some days before the hens. I do not think it is proved that they start earlier; but, being generally stronger than the females, it is very natural that they should outstrip their weaker mates. I think, too, that there is evidence that those species which have the most extended southerly, have also the most extended northerly range. The same may hold good of individuals of the same species, and may be accounted for by, or account for, the fact that, *e.g.*, the individuals of the wheatear or of the willow wren which penetrate furthest north have longer and stronger wings than those individuals which terminate their journey in more southern latitudes. The length of wing of two specimens of *Saxicola œnanthe* in my collection from Greenland and Labrador exceeds by ·6 inch the length of British and Syrian specimens, and the next longest, exceeding them by ·5 inch, is from the Gambia. So the sedentary *Phylloscopus trochilus* of the Canaries has a perceptibly shorter wing than European specimens.

To say that migration is performed by instinct is no explanation of the marvellous faculty, it is an evasion of the difficulty. Professor Möbius holds that birds crossing the ocean may be guided by observing the rolling of the waves, but this will not hold good in the varying storms of the Atlantic, still less in the vast stretch of stormy and landless ocean crossed by the bronze cuckoo (*Chrysococcyx lucidus*) in its passage from New Guinea to New Zealand. Professor Palmén ascribes the due performance of the flight to experience, but this is not confirmed by field observers. He assumes that the flights are led by the oldest and strongest, but observation by Herr Gätke has shown that among migrants, as the young and old journey apart and by different routes, the former can have had no experience. All ornithologists are aware that the parent cuckoos leave this country long before their young ones are hatched by their foster-parents. The sense of sight cannot guide birds which travel by night, or span oceans or continents in a single flight. In noticing all the phenomena of migration, there yet remains a vast untilled region for the field naturalist.

What Professor Newton terms the sense of direction, unconsciously exercised, is the nearest approach yet made to a solution of the problem. He remarks how vastly the sense of direction varies in human beings, contrasting its absence in the dwellers in towns compared with the power of the shepherd and the countryman, and, infinitely more, with the power of the savage or the Arab. He adduces the experience of Middendorff among the Samojeds, who know how to reach their goal by the shortest way through places wholly strange to them. He had known it among dogs and horses (as we may constantly perceive), but was surprised to find the same incomprehensible animal faculty unweakened among uncivilised men. Nor could the Samojeds understand his enquiry how they did it. They disarmed him by the question, How now does the arctic fox find its way aright on the Tundra, and never go astray? And Middendorff adds: "I was thrown back on the unconscious performance of an inherited animal faculty;" and so are we!

There is one more kind of migration, on which we know nothing, and where the field naturalist has still abundant scope for the exercise of observation. I mean what is called exceptional migration, not the mere wanderings of waifs and strays, nor yet the uncertain travels of some species, as the crossbill in search of food, but the colonising parties of many gregarious species, which generally, so far as we know in our own hemisphere, travel from east to west, or from south-east to north-west. Such are the waxwing (*Ampelis garrula*), the pastor starling (*Pastor roseus*), and Pallas's sandgrouse, after intervals sometimes of many years, or sometimes for two or three years in succession. The waxwing will overspread Western Europe in winter for a short time. It appears to be equally inconstant in its choice of summer quarters, as was shown by J. Wolley in Lapland. The rose pastor regularly winters in India, but never remains to breed. For this purpose the whole race seems to collect and travel north-west, but rarely, or after intervals of many years, returns to the same quarters. Verona, Broussa, Smyrna, Odessa, the Dobrudscha have all during the last half-century been visited for one summer by tens of thousands, who are attracted by the visitations of locusts, on which they feed, rear their young, and go. These irruptions, however, cannot be classed under the laws of ordinary migration. Not less inexplicable are such migrations as those of the African darter, which, though never yet observed to the north of the African lakes, contrives to pass, every spring, unobserved to the lake of Antioch in North Syria, where I found a large colony rearing their young, which, so soon as their progeny was able to fly, disappeared to the south-east as suddenly as they had arrived.

There is one possible explanation of the sense of direction unconsciously exercised, which I submit as a working hypothesis. We are all aware of the instinct, strong both in mammals and birds without exception, which attracts them to the place of their nativity. When the increasing cold of the northern regions, in which they all had their origin, drove the mammals southward, they could not retrace their steps, because the increasing polar sea, as the arctic continent sank, barred their way. The birds reluctantly left their homes as winter came on, and followed the supply of food. But as the season in their new residence became hotter in summer, they instinctively returned to their birthplaces, and there reared their young, retiring with them when the recurring winter impelled them to seek a warmer climate. Those species which, unfitted for a greater amount of heat by their more protracted sojourn in the northern regions, persisted in revisiting their ancestral homes, or getting as near to them as they could, retained a capacity for enjoying a temperate climate, which, very gradually, was lost by the species which settled down more permanently in their new quarters, and thus a law of migration became established on the one side, and sedentary habits on the other.

(*To be continued.*)

# The American Association for the Advancement of Science.

## Evolution and Classification.*

### BY C. E. BESSEY, PRESIDENT OF THE SECTION.

As we have gathered up the scattered masses of botanical knowledge, laboriously wrought out by many isolated workers, and attempted to fit them together into a consistent whole, which should outline the structure of the temple Botany, we have found that the workmen have not always followed the same architectural plan, and have often used different units of measurement. With the increasing specialisation so noticeable year by year there is a corresponding lack of co-ordination of work. To this lack of co-ordination, this want of unity of measurement, this misunderstanding of plan, we can no longer close our eyes, and I therefore feel free to invite your attention to the following somewhat summary discussion of the causes of the present unsatisfactory condition, in the hope that we may thereby be enabled to see how we may make some improvement.

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* Abstract of Presidential Address to Section G (Botany). Reprinted from *Nature*.

All botanical knowledge finally culminates in some kind of classification. The facts of histology, morphology, and physiology are of great biological importance, but the greatest of all biological facts is that the world is peopled with living things. We may group and arrange in orderly sequence the histological facts of the science; we may do likewise with the facts which the morphologist has discovered; we may make a classification of all the known physiological facts; but beyond and above these lies the greatest grouping of all—the grouping in orderly sequence of the organisms themselves whose histology, morphology, and physiology we have studied.

It is now a full third of a century since a great light was first turned upon all biological problems by the formulation of the doctrine of evolution by the master-mind of Darwin. In its light many puzzles have been solved, and many facts hitherto inexplicable have been made plain. We now know what relationship means, and we have given a fuller meaning to the natural system of classification. From the new point of view a natural classification is not merely an orderly arrangement of similar organisms. It is an expression of genetic relationship. Furthermore, in the light of evolution we now see the meaning of many reduced structures whose significance was formerly not at all—or but vaguely—understood. We have become familiar with the fact that degradation is a prominent factor in the vegetable kingdom. Evolution has by no means always involved an advance in structural complexity. Often this catagenesis is a result of parasitism or saprophytism, as is so well illustrated in the "fungi," where the degradation has gone so far that their relationship has to a great degree been obscured.

But there are also many cases of a catagenesis not due to a dependent habit in which we have evidence of a simplification from a more complex structure. Thus, in the willows and poplars, where we have a raceme of very simple flowers, each consisting of a single ovary, or one to many stamens, it is readily seen that this simplicity is not primitive. The ovaries are not single carpels, but are composed of two or three united. The flower of the willow is simple by a degeneration from a higher type—probably a tricarpellary or pentacarpellary type—by the loss of its floral envelopes and stamens or pistils.

Every naturalist should be as familiar with these illustrations of evolution by simplification as he is with those of evolution by complication. In the growth of the great tree of life, while the development has been most largely in an upward direction, so that the great body of the tree has risen far above its point of beginning, there are yet multitudes of twigs and branches which droop downward.

I need not now, before a body of scientific men, speak of evolution as an hypothesis; for we know it as a great biological fact, about whose existence there is no shadow of doubt. A natural classification will conform strictly to the lines of evolution, it will be in fact a clear exposition of the successive steps in its progress. In such a classification the primitive forms will precede the derived ones, and the relation of the latter will be positively indicated. Moreover, in such a system there will be no confusion between the primitively simple forms and those which are so by derivation.

An examination of our common systems shows them sadly deficient in the essentials of a scientific classification. This is particularly true of the treatment of the flowering plants at the hands of English and American botanists. Nothing could show better the conservatism of botanists than the fact that for a third of a century after the general acceptance of the doctrine of evolution, they are still using so crude an arrangement of the group of plants with which they are most familiar.

I may assume that it is well known to nearly all of us that the prevailing arrangement of the Dicotyledons does not represent the later views of any of the systematists. The fact is that the systematic disposition of the higher plants is at present a make-shift, maintained by conservatism, and a reverence for the time-honoured work of the fathers. It is unscientific to let our practice drag behind the present state of our knowledge; it is far more so for us to cling to the opinions of our fathers, through mere reverence, long after we know them to be untenable. It is not to the credit of our science that for a second time she has persistently held to a system through such considerations. For thirty or forty years after a natural system had been constructed by Jussieu, botanists as a body still adhered to the artificial system of Linné. Now, sixty years later, we find ourselves faced with a problem similar to that which Lindley, Torrey, Beck and Gray met. History repeats itself with such exactness that, with the change of a word here and there, the arguments *pro* and *con* then used may be used to-day. The system of Jussieu and De Candolle is now as much a clog and a hindrance to the systematic botany of the higher plants as was that of Linné sixty years ago; and now, as then, it is the spirit of conservatism and of veneration for time-honoured usage which maintains the incubus.

Manifestly a system of classification which conforms to and is based upon the doctrine of evolution must begin with those forms which are primitive, or which as nearly as may be represent primitive forms. Since the flower is a shoot in which the phyllomes are modified for reproductive purposes, that flower in which the phyllomes are least modified must be regarded as primitive, while that in which there is most modification must be regarded as departing most widely from the primitive type. The simple pistil, developed from a single phyllome, is primitive and lower, the compound pistil is derived and higher. The several seeded compound ovary must be lower, and the compound ovary with but one seed must be higher. Separate stamens are primitive, united stamens, whether the union be with one another or with other structures, must be derived and consequently higher. So, too, when all parts of the flower are separate, it is a primitive condition, and when they are united it is a derived structure.

Applying these principles to the flowering plants it becomes evident that in the Dicotyledons either the Apetalæ or the Polypetalæ must furnish our starting point. The Gamopetalæ are universally admitted to be higher than the groups just mentioned, and certainly do not contain the sought for primitive types. Even a hasty examination of the thirty-six apetalous families shows that they are, at least to a very large extent, derived from the Polypetalæ by the abortion of some parts and the entire omission of others. It will not be difficult to determine that the Ranales must take rank below all other Polypetalæ, in the sense of representing more nearly than any other group the primitive Dicotyledons.

The attempt to make a natural system by linking family to family in a long undulating chain, by concatenation, is unscientific because it absolutely fails to conform to the law of evolution. We must abandon the old classification and attempt one which in the light of revolution is rational. Let us not cling to the old because it is inconvenient to change, let us not cling to it through a mistaken reverence for the practice of the fathers, let us not cling to it as long as a flaw may be found in a new system. Science is ever abandoning the old when the old is no longer the true; it tears down the work of years when that work no longer represents the truth; and it dares to reach out and frame a rational system, even though some parts of it for a time rest upon hypothetical grounds.

### A REVISED ARRANGEMENT OF THE BENTHAMIAN "SERIES" OF FLOWERING PLANTS.

*Monocotyledons.*

Apocarpæ.
Coronarieæ.
Nudifloræ.
Calycinæ.
Glumaceæ.
Hydrales. (Hydrocharideæ).
Epigynæ.
Microspermæ.

*Dicotyledons.—Polypetalæ.*

Thalamifloræ (including the apetalous Curvembryeæ, Micrembryeæ, and "Ordines Anomali," and the Euphorbiaceæ and Urticaceæ, etc , of the Unisexuales).

Discifloræ (including the apetalous Daphnales and the Juglandaceæ and Cupuliferæ, etc., of the Unisexuales).

Calycifloræ (including the apetalous Aristolochiaceæ and Cytinaceæ).

*Gamopetalæ.*

Heteromeræ.
Bicarpellatæ.
Inferæ.

## Parliamentary and Law Proceedings.

### POISONING BY MORPHINE.

On Tuesday, October 24, at the Hammersmith Coroner's Court, Mr. C. Luxmoore Drew held an inquiry concerning the death of Roland Essex Ashley Teesdale Fencock, aged 15 years, son of Mr. William Fencock, a staff paymaster in the Royal Navy, and lately residing at 14, Ellingham Road, Shepherd's Bush, who died from poisoning by morphia self-administered on Friday.

William Teesdale Fencock, of 14, Ellingham Road, identified the body as that of his brother, who had not enjoyed very good health of late, as he suffered from neuralgia. He went to school, and witness knew of nothing to worry or trouble him. On Thursday he seemed cheerful, but when witness went to bed he noticed that the deceased was very pale and was perspiring freely. Witness woke him, and he said, "Willie, I have taken morphia; don't say anything to anybody." He at once called his mother and a doctor. The deceased did not say why he had taken the morphia, neither had he appeared strange of late, although he used to sleep heavily. There was no history of insanity in the family.

John Arthur Barnett, pharmaceutical chemist, of 97 (late 117), Uxbridge Road, Shepherd's Bush, said he had known the deceased for a number of years. On Thursday he came to the shop and asked for two drachms of morphia, saying he wanted to use it for testing in chemistry. Witness had often sold him acids for the same purpose, and on this occasion he described the charts and the reactions he intended to use for it. Witness thought he was considerably older than fifteen, and advised him to be very careful, as it was poison, and served him. The deceased said, "I want to take it to the laboratory." He signed the register with his name and address.

By the Coroner: It was a poison under schedule 2, and was often used for analytical purposes. Witness thought he was a student at Kensington, as he said he was studying chemistry. He had often bought test-tubes and chemical apparatus, but had never had morphia before. He had two drachms, but two or three grains had been known to kill.

Dr. William Prior Mallam, of 116, Uxbridge Road, Shepherd's Bush, said he had known the deceased for some years, but never knew that he was in the habit of taking morphia. He was a bright and cheerful boy. Witness was called on Thursday night and found deceased suffering from morphia poisoning. He died the next day at half-past ten, and death was undoubtedly due to morphia poisoning. In a drawer he found 1½ drachms of morphia.

By the Coroner: an advanced student might require morphia for testing.

Rev. G. E. Mackie, head-master of the Godolphin School, Hammersmith, said the deceased was a scholar of his. He used to study chemistry, but last May he removed his apparatus, saying he was going to study at the Polytechnic School. Witness did not think that was the truth. The boys were not allowed to experiment in drugs. Lately the deceased had been given to alternate fits of dulness and romance, and witness was convinced that he had been experimenting on himself with drugs, as he often appeared dull and was rude to the masters.

Mr. Henry Lee Harvey, of 121, Coningham Road, Shepherd's Bush, said he knew the deceased's family. Lately he had noticed a great change in the deceased, and instead of being cheerful he appeared to be dull and heavy, and witness was of opinion that he had habituated himself to the use of some drug.

Rev. G. E. Mackie asked to be allowed to state that on the morning deceased purchased morphia he asked a fellow scholar, the son of a medical man, to ask his father how much morphia would kill, and the reply he received was "two grains a weak man."

The Coroner, in addressing the jury, said the chemist had carried out all the regulations required under the Pharmacy Act, but it seemed perfectly monstrous that the law should be such as to allow a boy of fifteen to be able to purchase such a drug. It was a ridiculous Act, and the sooner it was altered the better. There was no doubt the boy's death was due to morphia poisoning, but it was for the jury to say whether such death was due to misadventure, or with suicidal intent. If the latter, they would have to decide the state of his mind at the time.

The jury, after some deliberation, returned a verdict "That the deceased died from morphia poisoning self-administered, and that such death was due to misadventure," and added a rider that they considered further restrictions should be placed on the sale of poisons.—*Morning Advertiser.*

## Correspondence.

### "BELLADONNA AT THE CONFERENCE."

Sir,—I am much obliged to Mr. Naylor for correcting my "erroneous assumption" that the same belladonna was used throughout the experiments tabulated in the first column, p. 174, of your Journal. It is usual in comparative experiments to vary only one condition at a time, and it did appear that the difference in strength of alcohol was the particular variation in that set of experiments, otherwise the table gives an erroneous impression, and it is difficult to see wherein its value lies. Nos. 1 to 5 may represent isolated facts, but as explained in Mr. Naylor's letter, they "cannot be compared among themselves, since they are not referable to a common standard."

*London.* P. W. SQUIRE.

Sir,—The thanks of pharmacists are due to your correspondent, Mr. P. W. Squire, for his contribution to the discussion on the above subject, and certainly no apology is needed for re-opening (if that word can be used in connection with what is still an open question) such a discussion. The fact that I do not find myself in complete agreement with all the ideas contained in his letter, coupled with the additional fact that there are one or two points of importance in connection with the subject still remaining for discussion and controversy, must be my justification for troubling you in the matter.

I may at once say that there is no contradiction whatever between Mr. Naylor's results and my own. Mr. Naylor must have worked upon a specimen of leaf of low alkaloidal strength, and this of itself would be quite sufficient to account for any apparent discrepancy in our results. A reference to his paper shows that only 26·27 grains of alkaloid was obtained from a pound of the leaves, corresponding to a yield of ·38 per cent.; while, as mentioned by Mr. Squire in his note, eight specimens of English belladonna leaves examined by Mr. Farr and myself gave amounts varying between the limits of ·42 and ·88, with an average of ·55 per cent. The drug used in my experiments on collodium belladonnæ was obtained from a well-known grower of medicinal plants in the midland counties; and although not assayed for alkaloid, I have little doubt but that it would contain almost, if not quite, the maximum amount recorded above. As bearing upon the question of the possible or probable strength of a 1 in 1 and 2 in 1 fluid extract of belladonna leaves, permit me to refer those interested in the matter to the results recorded in Table II. of a note on "Standardisation of Alkaloidal Tinctures" by Mr. Farr and myself, read at the late Conference. It will there be seen that when operating upon two specimens of the leaf, by continuous percolation, and collecting the percolate in fractions, the first fraction (representing a 1 in 1 fluid extract) was found to contain ·46 per cent. alkaloid in the first experiment, and ·40 per cent. in the second.

On the basis of these results it does not need any great strength of the imagination to understand that by the process submitted by me at the Conference for the production of a 2 in 1 fluid extract, with the special precautions taken to ensure the production of the most concentrated preparation possible under the circumstances, it should not be a difficult matter to produce a fluid extract of the strength mentioned in my note.

In the discussion on the subject at the Conference, I ventured a remark upon the importance of the employment for belladonna preparations of the leaves of English grown plants alone, and also insisted upon the absolute necessity, in order to produce a concentrated strongly alcoholic fluid extract, of using the leaves in fine powder. Both these observations I now venture to repeat, with special emphasis upon the latter. I do this because I have frequently remarked that whereas it is a comparatively easy matter to exhaust a root of its alkaloids even when in moderately coarse powder, with a limited supply of menstruum, it is much more difficult under similar circumstances to secure exhaustion of the leaves of plants. The question as to what standard of alkaloidal strength should be fixed for the fluid plaster appears to me to be one well worth consideration. The solid plaster of the British Pharmacopœia contains one part of the root extract in five, and may be taken to contain, on an average, about ½ (·5) per cent. of alkaloid.

In the light of the statement made by Mr. Gerrard during the Conference discussion, which the experience of pharmacists generally will enable them to corroborate, viz., that "when the plaster was made according to the B.P., complaints were made that blisters were sent instead of plasters," and that consequently "he had been obliged to reduce the belladonna extract to one-half the quantity directed," I do not think it would be wise to fix the standard for the fluid plaster higher than ·25 per cent.

For some time past I have supplied two of the medical men in this locality with a preparation of the above strength. From one I have had no report as to its efficacy, but the other states that he has employed it in many cases for suppression of milk with marked success, and that it appears to answer every requirement. In one case it produced pustular eruptions.

It scarcely falls within my province to deal critically with the whole of the subject matter of the letter of your correspondent, but upon one important point I find myself completely at issue with him. Inferentially, although not making any specific statement to that effect, he runs full tilt against the production of this preparation from a fluid extract, and, failing the possibility of the utilisation of a solid extract, "would recommend for trial percolation with an ammoniated menstruum, as suggested by Mr. Linford, or with the addition of ammonia to the dry powder."

The discussion on the subject at the Conference turned almost entirely upon this very point, and several of the members present appeared to favour such a process. For my own part, I still adhere to the opinion then expressed, that no galenical preparation can claim adequately to represent a drug unless it contains the active principles in the state of combination in which they exist in the drug, inert matter alone being excluded. I do not say that there would be so strong an objection to the employment of a slightly alkaline alcoholic menstruum for a belladonna liniment as there would be to the process subsequently given in Mr. Squire's letter for the production of chloroformum belladonnæ. The former would at least have this advantage, that it might be expected to remove a maximum of extractive; but when Mr. Squire proceeds to recommend the preparation of chloroformum belladonnæ by mixing the powdered root with carbonate of ammonium and slaked lime, and then percolating the mixture with chloroform, one really feels disposed to ask whether the object in view is to produce a galenical preparation of belladonna or to devise a process for the determination of the alkaloids contained in the root. For certain it is that the result of such treatment must be, not a preparation of belladonna at all, but a chloroformic solution of the belladonna alkaloids, with some slight impurities.

It appears to me that the logical outcome of such pharmaceutical processes as this must undoubtedly be the substitution of preparations of the alkaloids for those of the drug, and I certainly do not think these are "lines which leave less room for criticism" than those upon which the authors of papers on "Belladonna at the Conference" proceeded.

*Buxton.* R. WRIGHT.

*T. Foxcroft.*—You had better get medical advice upon the subject.

## NOTICES OF MEETINGS NEXT WEEK.

### WEDNESDAY, NOVEMBER 1.

*Brighton Junior Association of Pharmacy*, at 9 p.m.
Social and Musical Evening.

### THURSDAY, NOVEMBER 2.

*Chemists' Assistants' Association*, at 8.30 p.m.
"How can we check unjust trade," by C. E. Pickering.
*Midland Pharmaceutical Association*, at 8.15 p.m.
Inaugural Meeting. Address by Dr. Symes, of Liverpool.
*Liverpool Pharmaceutical Students' Society.*
"Recent Researches on Fungology," by R. J. Harvey Gibson.

### FRIDAY, NOVEMBER 3.

*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
Smoking Concert at the Alexandra Hotel.

### SATURDAY, NOVEMBER 4.

*Pharmaceutical Football Club v.* Metropolitan Police, N Div., at Shepherd's Bush, at 3.15 p.m.
Reserves *v.* The Breweries, at Balham.

## BOOKS, ETC., RECEIVED.

A VARIETY OF CURARA ACTING AS A MUSCLE-POISON. By JOSEPH TILLIE, M.D., F.R.S.E. Reprinted from the *Journal of Anatomy and Physiology*. Pp. 11. From the Author.

REACTIONS. By F. A. FLÜCKIGER, Ph.D., M.D. Translated, Revised, and Enlarged by J. B. Nagelvoort. Detroit: George S. Davis. Pp. i.-x., 1 to 154. 8s. From the Publisher.

A MANUAL OF MEDICAL TREATMENT OR CLINICAL THERAPEUTICS. 2 Vols., with Illustrations. By J. BURNEY YEO, M.D., F.R.C.P. Pp. i.-xiii., 1 to 631, and i.-vi., 1 to 744. London: Cassell and Co. 21s. From the Publishers.

ANATOMISCHER ATLAS DER PHARMAKOGNOSIE UND NAHRUNGSMITTELKUNDE. Von Dr. A. TSCHIRSCH und Dr. O. OESTERLE. Lieferung 1; 5 plates, with descriptive letterpress. London: Williams and Norgate. 1s. 6d. net. From the Publishers.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Hill, Ingham, Jones, Saul, Tocher.

## NOTES ON MICROSCOPY.

PREPARATION OF TISSUES FOR SECTION-CUTTING.—In connection with the simple microtome described in the Journal of October 14 last, Dr. Gordon Sharp states that, though physiological and pathological specimens may be hardened by immersion in methylated spirit alone for about a week, he has lately made use, for this purpose, of a saturated solution of picric acid in methylated spirit. This method is said to yield excellent results, the tissues being ready for cutting in twenty-four hours at the outside, and the only drawback it possesses is that the sections must always be stained with picro-carmine. Whichever method of hardening be adopted, the tissue must subsequently be washed by means of a stream of water for half-an-hour to remove all traces of the hardening agent. It is then gently pressed between the folds of a cotton or linen cloth to displace moisture before freezing. Afterwards, about twenty minims of thick mucilage of acacia is poured on to the zinc stage, D (Figs. 1 and 2), of the microtome, and a piece of tissue the size of a bean placed in position and pressed close to the stage, in such a manner that it is surrounded by the fluid. The stage is next adjusted so that the top of the piece of tissue is on a level with the glass guides, BB, and the spray is then connected and worked until the mucilage becomes completely frozen, after which the sections can be cut, the stage being slightly raised after each one is removed, by turning the screw E to the right. Ordinary ether (s.g. 0·720) answers very well, but a mixture of equal volumes of this and petroleum ether is said to be better. As mentioned on page 301, one fluid drachm should suffice for a piece of tissue of the size mentioned. In the case of hard tissues, such as stems, roots, etc., a cylinder of carrot, turnip, or potato may be cut to fit the well C (Fig. 3), and the material embedded in an opening in this, after softening sufficiently by soaking in water. Or, where this plan is not suitable, paraffin wax, melting between 45° and 50° C., is moulded to fit the well and, a cavity having been made in the upper end of the block, the tissue is placed in position and melted wax poured in to cover it (see *Pharm. Journ.*, [3], xxiii., 42). Porous substances must be hardened in alcohol, cleared in oil of cloves, and placed in melted paraffin wax. When cool, the mass is fitted to the well C and cut as before. To remove the wax from sections, place them in chloroform, which dissolves it, afterwards wash in alcohol to remove chloroform, and finally in water or oil of cloves, according to the staining agent and mounting medium to be employed (see also Squire's 'Methods and Formulæ,' and Flatters, *Pharm. Journ.*, [3], 1057, and present volume, p. 17).

IDENTIFICATION OF PECTIC SUBSTANCES.—The method recommended by L. Mangin for determining the presence of these substances in plant tissues is to wash sections with acetic acid (1·5 per cent.), then neutralise and treat with a mixture of naphthylene blue R and acid green. The pectic compounds are stained violet by the former, whilst lignin and suberin fix the green stain. By acting on small pieces of tissue with dilute hydrochloric acid, or a mixture of acid, 1 part, and alcohol, 3 parts, pectic acid if present will be separated from the base (usually lime) with which it is combined. It is quite insoluble in water, but may be dissolved by the action of a weak alkali and then precipitated in gelatinous flakes by a weak acid. Pectose is found associated with the calcium pectate, but is not readily isolated, remaining behind after the action of the alkali (*Journ. de Bot.*, vi., 363).

MOUNTING MEDIUM FOR STARCH GRAINS, ETC.—A. Geoffroy uses the following preparation for mounting starch grains, algæ, the lower fungi, etc.:—Gelatin, 3 or 4 Gm., is dissolved in a ten per cent. solution of chloral hydrate, 100 C.c. Preparations stained with carmine or iodine-green are said to retain their colour for a very long time in this medium. It should be slightly warmed to liquefy it thoroughly, then applied in the same way as glycerin, and the slide put aside for the gelatin to set, after which a ring of cement may be run round the cover-glass (*Journ. de Bot.*, vii., 55).

NEW PROCESS OF DOUBLE STAINING.—Dr. L. Rhumbler recommends a staining mixture by means of which it is claimed that it is possible to distinguish between substances that were living or dead respectively at the time of preservation. It consists of fifty parts (? C.c.) each of a one per cent. aqueous solution of methyl-green; a solution of eosine, 0·8 Gm., in fifty per cent. alcohol; and absolute alcohol. The stain is said to act on material preserved in alcohol or picro-sulphuric acid in half-an-hour, substances that were living when preserved staining a brilliant red, whilst others acquire a bright green colour (*Zool. Anzeig.*, xvi., 47, through *Journ. R. M. S.*).

SOLUTION OF HÆMATOXYLIN.—Professor S. H. Gage, supposing that the dark deposit forming in aqueous solutions of hæmatoxylin might be due to the action of living ferments, prepared a solution of the following composition, and recommends it for its keeping properties:—Hæmatoxylin, 0·10 Gm.; chloral hydrate, 4 Gm.; potash or ammonia alum, 7·5 Gm.; distilled water, 200 C.c. The water and alum should be boiled together for five to twenty minutes to effect sterilisation, and the other ingredients then added. After keeping for six months no deposit had formed, and the staining action was unaffected (*Proc. Amer. Micr. Soc.*, xiv., 125, through *Journ. R. M. S.*).

MEASUREMENT OF STARCHES.—To ensure accuracy in identifying and comparing starches it is essential to measure the grains, besides having a fair idea of the limits of size within which particular starches may vary. Both stage and eyepiece micrometers are needed for measuring, the former being divided to 0·1 and 0·01 Mm., and serving to determine the value of the spaces between the lines—ruled to 0·1 Mm.—on the glass disc that is dropped into the eyepiece. The actual work of measurement is performed with the eyepiece micrometer, and since the value of the divisions on this varies according to the power of the objective and eyepiece used, as well as with the length of the microscope tube, it is necessary to note these factors carefully if accurate results are desired. Thus, with a tube length of 160 to 180 Mm., a one-sixth inch objective, and B eyepiece, the value of one division on the eyepiece micrometer, as determined by the stage micrometer, would probably be about 3 *micra* (a micron, $\mu$, = 0·001 Mm.). It will be found to save much time in calculating to so adjust the tube length that the value of the divisions may be represented by a whole number. A note should then be made of this value, together with parti-

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culars of the tube length and lenses used, so that, by always observing the same conditions, all observations may be referable to a common standard. A magnification of about 250 diameters will be found best in examining starches, and it should be a rule to obtain actual, not average, measurements. The latter vary considerably, as noted by different observers, as will be seen in the following table, the length being given in micra in each case :—

| Kind of Starch. | According to Weisner, Höhnel, Wagner. | According to Tschirch. | According to Muter. |
|---|---|---|---|
| Potato ... | 60·0 | 56·0 | 37·6 to 67·6 |
| Wheat ... | 6·8 to 28·0 | 6·0 to 33·0 | 2·3 to 47·0 |
| Maranta... | 27·0 to 54·0 | 32·0 to 46·0 | 32·8 to 37·6 |
| Pea ........ | 32·0 to 79·0 | 29·0 to 39·0 | 18·8 to 28·2 |
| Rice........ | 5·0 | 5·0 to 6·0 | 5·0 to 7·7 |

There seems to be no definite rule observed as to the manner in which the average size should be taken, and it is much preferable to note the sizes both of the largest and smallest granules observed. A large number of different samples of each starch should be examined, and each one ought to be well stirred before specimens are taken, so as to ensure them being thoroughly representative of the bulk.

## THE PHARMACEUTICAL SOCIETY OF JAPAN.

This Society is the successor of the Tokyo Pharmaceutical Society, which was founded in 1878 by the graduates and undergraduates of the pharmaceutical section of the Medical Department of Tokyo University. At first it comprised only fifty members, and owing to defective organisation gradually declined in activity, ultimately ceasing to hold meetings. It was reinstated on a firmer basis in 1881, the number of members gradually increased to six hundred and, in 1892, the name of the Society was altered to that of the Pharmaceutical Society of Japan. The Society consists of a President, Vice-President, Secretary, Treasurer, and ten other members of Council, besides a Committee of Publication of five members. An ordinary meeting is held every month, except August, to hear and discuss reports of investigations by the members. These are subsequently published in the monthly journal called *Yaku-Gaku-Zasshi.* Of this journal 136 numbers have been published since 1881, each on an average containing about 60 pages. On two occasions pharmaceutical exhibitions have been organised, viz., in January, 1890, and April, 1893. On these occasions the products of pharmaceutical investigations and applications were exhibited with the view of showing the recent progress made in pharmacy in Japan, and of suggesting directions in which future advances might be made. A list of the contents of the Journal since 1881 is published in the English language. Besides a series of papers on ordinary pharmaceutical articles and dietetic substances, it contains the records of a number of original investigations of native remedies, etc., of which the following may be mentioned, since information concerning them can scarcely be found elsewhere :—*Pachyma Cocos*, Fries.; *Muricia Cochinchinensis*, Don.; *Coriaria Japonica*, A. Gray; *Tanakæa radicans*, Fr. and Sav.; *Nandina domestica*, Thunb.; *Pæonia* "*Moutan*," Sims; *Sophora angustifolia*, Sieb. et Zucc.; *Mosla Japonica*, Max.; *Phytolacca acinosa*, Roxb.; *Aconitum Fischeri*, Reich.; *Quercus glandulifera*, Bl.; *Bambusa Senanensis*, Fr. and Sav.; *Senecio Kæmpferi*, D. C.; *Scutellaria lanceolaria*, Miq.; *Pueraria Thunbergiana*, Bth.; *Sagittaria sagittæfolia*, L.; *Datura alba*, Nees.; *Adonis Amurensis*, Reg. and Radd; *Ephedra vulgaris*, Rich.; *Brassica cernua*, Bth.; *Begonia grandis*, Dry.; *Eutrema* "*Wasabi*," Max.; *Atractylis lancea* and *A. ovata*, Thunb.; *Ligustrum Japonicum*, Thunb.

## STRUCTURE OF YEAST-CELLS.

In connection with the claim of Dangeard (*ante*, p. 83) to have proved the existence of well-characterised nuclei in the *Saccharomyces cerevisiæ*, it may be noted that other recent investigators have not attained similar results. G. Hieronymus (*Ber. deutsch. bot. Gesell.*) finds the contents of yeast cells to present a similar fibrillar structure to that seen in the *Phycochromaceæ*. Angular granules lying in the protoplasm probably consist of nuclein, and are always arranged in rows intertwined into a more or less regular spiral or ball, which is distinguished as the central thread. J. Raum (*Zeit. f. Hygiene*) also failed to find true nuclei present in yeast-cells, but found, when the conditions of nutrition were favourable, bodies known as sporogenic granules in the ten species he examined. The granules exhibit great variation and, as no membrane or any definite structure could be observed in them, are probably of fluid consistence. They are digestible by pepsin and may, therefore, be of the nature of nuclein. Vacuoles were also frequently present in the cells, of a size in inverse ratio to that of the granules, but in kephir yeast they were absent (*Journ. R. M. S.*).

## EXPERIMENTS ON THE DECOLORISATION OF OIL OF AMBER.

### BY A. JOLLES.

Amber-oil is a product of the dry distillation of amber, and consists, in its crude state, of a mixture of water, succinic acid, and oil of amber. On standing it separates into three layers, the lowest consisting of water, the next containing the bulk of the succinic acid, whilst the upper layer contains the oil of amber. By drawing off the oil thus collected it is obtained as a dirty brown, fluorescent liquid, possessing a nauseating odour. It is insoluble in water, but soluble in alcohol, ether, benzene, and many other solvents. The oil is scarcely acted upon by dilute mineral acids, but concentrated sulphuric and nitric acids react violently with it. By the action of nitric acid much succinic acid is produced, and an orange-coloured resin possessing a strong odour of musk is produced, which is used as an "artificial musk." Reducing agents have no effect upon amber-oil. Treatment with animal charcoal and other decolorising agents does not in the least improve the colour of the oil. In distilling oil of amber, first water is obtained, then a yellow oil, followed by a green oil, and lastly a dark green oil. The temperature during distillation range between 150° and 360° C. A tarry matter remains behind amounting to about 15 per cent. of the crude oil used. The distillates obtained still possess the repugnant odour of the original oil. By carrying out the distillation, however, in a current of steam, almost odourless distillates are obtained. These distillates can be bleached by adding to them about 8 per cent. of permanganate of potash or bichromate of potash, together with the required quantity of dilute sulphuric acid. The oil is then left to separate from the water, the latter is drawn off, the oil completely dehydrated by addition of common salt or plaster of Paris, and then filtered. In the bleaching from 7 to 9 per cent. of the oil is lost.—*Dingl. polyt. J.*, through *Journ. Soc. Chem. Ind.*

The Pharmaceutical Journal
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, NOVEMBER 4, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the meeting held last Wednesday, the President, before proceeding to the regular business, spoke of his visit to Chicago to attend the meetings of the American Pharmaceutical Association and the International Pharmaceutical Congress. Referring in the first instance to the Hanbury Medal, which he had been deputed to present to the late Professor Maisch through the President of the Congress, he explained that on hearing of the serious illness of Professor Maisch, he thought it proper to communicate at once to the Association the award of the Hanbury Medal, so that Mrs. Maisch might be informed of the fact. The formal presentation of the medal took place at the meeting of the Congress, and the President, Professor Remington, having received it on behalf of Professor Maisch, conveyed it to him. An acknowledgment of the honour conferred was received from Mrs. Maisch, with an intimation that the award had been highly appreciated. In regard to the reception accorded to himself and the other delegates from the Pharmaceutical Society, the President said it was such as to make them feel deeply grateful, while the fact of the Society having sent three delegates to the Congress had afforded great satisfaction to American pharmacists.

The additions to the roll of the Society comprised two pharmaceutical chemist members, twenty-seven associates, and one student. Several persons were restored to their former status in connection with the Society, and others were restored to the Register of Chemists and Druggists.

The report and recommendations of the Finance Committee were of the usual character. The President mentioned that during the month subscriptions and ground rents amounting to £394 8s. had been received, and the expenditure had amounted to £583. The donation account remained unaltered, and the Orphan Fund had received a donation of one guinea.

On the recommendation of the Benevolent Fund Committee, one grant of fifteen pounds, one of thirteen pounds, and four grants of ten pounds each were ordered to be paid. The death of one of the candidates for an annuity was announced, as well as the removal of another from the list in consequence of altered circumstances, so that there will be only eight candidates instead of ten at the approaching election.

An application from the School of Pharmacy connected with the Sheffield Pharmaceutical Society for materia medica specimens, and the recommendation of the Library, etc., Committee that the request should be acceded to, gave rise to a long discussion. The Vice-President, in moving the adoption of the report and recommendations, expressed satisfaction that the Sheffield School is in a flourishing condition and well attended, and remarked that it must be understood the desire of the Council to further the cause of education —by making donations of specimens to museums in the provinces—was subject to a practical limitation, and could not, in any case, be given effect to except in regard to specimens for reference. This view of the matter was supported by Mr. Martin, Mr. Atkins, Mr. Martindale, Mr. Hampson, and Mr. Abraham. Mr. Schacht was, however, disposed to favour a less rigid interpretation of the regulations under which specimens are given, and he insisted upon the importance of students being allowed to handle drugs in order to become properly acquainted with their characters. Mr. Newsholme pointed out, in reference to this point, that students have, in the ordinary course of their business occupations, opportunity of handling drugs for examination, and that as there are but few provincial centres where education is being attempted, every possible encouragement should, for the time being, be given to those places where such work is carried on, and without regard to future contingencies. The President concurred with this view, and added that there might be cases where it would be desirable even to supply complete sets of students' specimens, the assistance being rendered by the gift of specimens or by a money grant for obtaining them. He hoped, therefore, that no discouragement would be felt from what had been said.

Attention was called by the President to the resignation of Mr. Long as Divisional Secretary for North Kensington, and mention was made of his long connection with and loyalty to the Society, as well as the useful efforts he has made to establish the Western Association, of which he had been for some time President. It was agreed that the President should send Mr. Long a letter thanking him for his services, and on the motion of the President, Mr. Thomas Wood Horsley was appointed to succeed Mr. Long as Divisional Secretary for North Kensington.

The nominations for the office of local secretary.

which had been considered by the General Purposes Committee, summarised in the list printed at page 374, were then brought under notice. The President remarked that in cases where a selection was necessary the Committee had acted to the best of its judgment, and that some difficulty had been experienced from the circumstance that approved nominees sometimes declined to act. He thanked those who had expressed a willingness to serve the office, and the appointments were agreed to by the Council. The appointment as superintendent of examinations at the several centres will be offered to the respective local secretaries.

The report of the Law and Parliamentary Committee stated that the communications from the Nottingham and Notts Chemists' Association and the Edinburgh District Chemists' Trade Association in reference to the medicine stamp duty had been discussed at considerable length. The result is that the Committee is of opinion that any alteration of the law would be disadvantageous to the interests of retail chemists and druggists. Whilst admitting that the administration of the Stamp Acts may in some instances be unequal, the Committee considers it would be impolitic to take any steps for bringing about an interview between the Board of Inland Revenue and the representatives of chemists and druggists. The further discussion of this subject by the members of Council is so fully reported, that the details of the views expressed in regard to it may best be gathered by reference to the full report. The adoption of the recommendation of the Committee by which the matter had been previously considered was carried without a contrary vote, and with the full concurrence of a very large majority of the members of Council, representing country districts throughout the kingdom as well as the metropolis.

The dates upon which the examinations are to be held in the course of the next two years were fixed, and twenty-two certificates were received in lieu of the Society's First examination.

The President mentioned that he had received a letter from Mr. George Arthur Lansdown, applying for appointment as the Society's architect and surveyor, in succession to his late father and partner, and having regard to his knowledge of Mr. Lansdown's qualifications, he moved that the appointment should be conferred upon him. The motion was seconded by Mr. Hampson and carried unanimously.

A proposition to amend the regulations of the Benevolent Fund was moved by the Vice-President, in accordance with notice previously given, seconded by Mr. Hampson, and carried. According to this amendment the Council will now have power not merely to withhold entirely the further payment of an annuity in the case of certain circumstances arising, but also to reduce the amount of the annuity in such manner as may appear advisable and appropriate, when the altered circumstances of the annuitant appear not to entirely disqualify him or her from receiving the benefits of the Fund.

The report of the General Purposes Committee gave the solicitor's statement of progress made with cases which had been placed in his hands, showing that several penalties had been recovered, while numerous defendants had paid penalties and costs before trial. The result of the application to the Court of Chancery in *re* Sleight's patent, reported at page 377, was also stated.

On the recommendation of the Committee it was ordered that proceedings should be commenced in a large number of cases of infringement of the Pharmacy Act, which have been considered by the Committee.

## PHARMACEUTICAL INTERESTS.

In the newspaper reports of an inquest recently held at Cardiff, it was stated that the coroner and jury had severely censured "a chemist" who had administered a draught to the deceased person. The case was commented upon in the *British Medical Journal* as an illustration of the mischievous effects resulting from chemists prescribing, and in a manner generally reflecting upon the entire body. The following week a letter appeared in the same journal, signed by Mr. Munday and Mr. Coleman, as local secretaries of the Pharmaceutical Society, pointing out that the person referred to as "a chemist" at the Cardiff inquest was not a registered chemist and druggist, and had no claim to the designation of "a chemist." These circumstances appear to show the necessity of local co-operation among qualified chemists for the purpose of protecting their interests, and it seems remarkable that in the town of Cardiff there should be an absence of such organisation for that purpose as would provide against the publication of erroneous statements calculated to be detrimental. It might be expected that in Cardiff the chemists would collectively have sufficient influence with the local press to protect themselves and the body to which they belong from being misrepresented. In any case it would have been desirable that the facts should have been made known to the Editor of the Society's Journal, so that a correction of the misstatement might have been made forthwith. The unlawful exercise of the business of chemist and druggist by persons who do not possess the requisite qualification is a matter which should especially engage the attention of the duly registered chemists in various localities, who are more immediately affected by such irregular practices, and for the sake of the general interests of qualified persons it is also desirable that instances of the kind should be made known to the authority empowered under the Pharmacy Act to repress unqualified practice.

### STATE PROTECTION AGAINST QUACKS.

In commenting upon the evidence brought forward in the prosecution of the Indians who have been performing operations and practising as ophthalmic surgeons without medical qualification, the *Times* expresses astonishment at the extent to which the ignorant classes are induced to put faith in anything irregular and anti-professional in connection with the healing art. No doubt ignorance has largely contributed towards facilitating the trade of quacks; but the support it receives is by no means confined to persons for whom the excuse of ignorance can be pleaded. Under the influence of civilisation mankind appears to have forsaken the instinctive method by which the cat or dog seeks relief for ailments by chewing grass, and to have replaced that habit by an exercise of belief in priestly power, witchcraft, or imposture. Human credulity has thus provided a rich field for exploitation by the charlatan and the nostrum monger, and the profitable nature of the trade may well be judged of by the advertisements which appear in and are a disgrace to some of our newspapers and other periodical publications. The *Times* raises the question whether persons such as the Indian oculists are to be allowed the free exercise of their antiquated arts, and the same question may well be extended to the nostrum mongers who recommend their medicines as specifics for all kinds of disease. It is thought that the ignorant classes of the population ought to be protected against themselves, and that the law ought to be armed with greater powers for controlling charlatans who meddle with the human body. In the same manner, and for equally good reasons, it might be argued that some protection against the wiles and devices of the proprietors of secret remedies and specifics should be provided by the State for the public good; but it is to be feared that the effort to do so would be both fruitless and unappreciated by those for whose benefit it was intended. Under existing conditions there is even some disinclination to enforce the legal enactments which have a similar object, such as the law relating to the sale of poisons and to unqualified medical practice.

### EVENING MEETING IN LONDON.

As announced last week the first evening meeting of the Pharmaceutical Society for the present session will be held at 17, Bloomsbury Square, on Wednesday evening next, when the chair will be taken at eight o'clock precisely, and papers will be read by Mr. J. S. Ward and Professor Greenish.

### PROSECUTIONS UNDER THE PHARMACY ACT.

A number of cases of offences under the Pharmacy Act were down for hearing at the Glasgow Summary Court, on Thursday last, but trial was adjourned until November 23.

### CARL WILHELM SCHEELE.

In the *Fortnightly Review* for November there is a sympathetic article by Professor T. E. Thorpe, on the famous Swedish pharmacist and chemist, an account of whose life and work appeared in this Journal on January 14 last. Professor Thorpe's article may be regarded as practically a notice of the volume recently edited by Baron Nordenskiöld, of letters, laboratory memoranda, and other papers belonging to Scheele, until the publication of which much in his life had been doubtful and obscure. At the same time there is not much, if anything, that is really new to publish and, after a necessarily brief but comprehensive survey of Scheele's career, it is pointed out that the true history of his life is, after all, to be found in his works. These, it is remarked, it is impossible to read without being impressed by Scheele's extraordinary insight, amounting at times almost to divination, and by his happy faculty of instructively seizing on what is essential and steering his way among the rocks and shoals of contradictory and conflicting observations. "No man was more staunchly loyal to the facts of his experiments, however strongly these might tell against an antecedent or congenial hypothesis." His work stamps him as the "greatest chemical discoverer of his age," and his story constitutes "one of the most striking examples of what may be achieved by the diligent cultivation of a single natural gift."

### SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The first meeting of this Association for the ensuing session will be held at 17, Bloomsbury Square, on Thursday, November 23, at 7 p.m., when the chair will be taken by the President, Professor Attfield, F.R.S., and an introductory address will be delivered by Mr. F. Ransom. At this meeting the election of officers will also take place. Nominations for the offices must reach the Honorary Secretary, Mr. F. W. Short, not later than Tuesday, November 7. The objects of the Association, as is now well known, are to encourage study and original work in those sciences upon which pharmacy is based: chemistry, physics, botany, and materia medica. Original investigation, by students, of subjects having direct pharmaceutical interest is aided by grants from the Research Fund of the Association.

### EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The opening meeting of this Association is to be held in the Pharmaceutical Society's House, York Place, Edinburgh, on Wednesday next, at 9.15 p.m. An inaugural address will be delivered by the President of the Association, Mr. Alexander J. Dey, and the botanical prizes will be presented by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, November* 1, 1893.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Abraham, Atkins, Bottle, Greenish, Grose, Hampson, Hills, Leigh, Martin, Martindale, Newsholme, Richardson, Schacht, Southall, and Young.

The minutes of the last meeting were read and confirmed.

### The American Congress.

The President said he would detain the Council for a few minutes before proceeding to the regular business, while he explained the course taken by himself and the other delegates to the meeting of the American Pharmaceutical Association and the International Pharmaceutical Congress, which met in Chicago. With regard to the Hanbury medal, he was instructed to present it to Professor Maisch himself, through the medium of the President of the Congress. When he arrived in Chicago the American Association was just commencing its session, and neither Professor Maisch nor anyone in the States knew of the award. In the course of half an hour, to his great sorrow, he heard that Professor Maisch was very ill—in fact, dying, and under those circumstances he thought it right to at once announce to the Association the honour that had been conferred on Professor Maisch, so that a communication might be made immediately to Mrs. Maisch. The medal was formally presented to the President of the Congress, Professor Remington, on the following Monday, who undertook to convey it to Professor Maisch, and he (the President) knew that it arrived safely and was duly appreciated. He also wrote a letter to Mrs. Maisch, stating what he had done, and received from her a sympathetic letter, expressing the great pleasure that the announcement of this honour had been to her, and saying that the Professor himself was sufficiently well to receive the medal and to appreciate the honour conferred upon him. With regard to the meeting of the American Pharmaceutical Association and the Congress, he had only to say that the delegates from the Pharmaceutical Society of Great Britain were received in every part of Chicago and in every city they went to, by individual pharmacists, as well as at meetings of the Association and Congress, in a manner which made them feel deeply grateful. Mr. Martin had been elected President of the British Pharmaceutical Conference while the Congress was in session, and might have been very properly considered a delegate from that body, but he was also a delegate from that Council and from the Society, and amongst the many pleasant reminiscences which American pharmacists had of these meetings, not the least pleasurable, he had been assured again and again, was the fact that the Pharmaceutical Society of Great Britain had sent three delegates. It was proposed in due course to publish the proceedings, a grant having been made by the American Pharmaceutical Association for that purpose, and a communication would be sent in due course to the Society, and also to certain prominent pharmacists and presidents of pharmaceutical bodies in Europe, with a view to arranging for a meeting of the Congress in Europe some few years hence.

### Diplomas.

The undermentioned, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Arrandale, John Samuel.
Bray, Frederick Richard.
Garner, James Norman.
Helsby, Fred.
Horrell, William Foskett Edward.
Low, Robert.
Norwood, John Percy.
Riley, Joseph Arthur.
Sage, Charles Edward.

### Elections.

#### MEMBERS.

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Garner, James Norman | London. |
| Helsby, Fred | Grimsby. |

#### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Dow, William | Kinross. |
| Garvie, Alexander | Leith. |

#### ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Students) their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Cox, Harry Bertrand | Shepton Mallet. |
| Cross, Herbert Francis | Cambridge. |
| Davies, Robert Fisher | Pontardawe. |
| Dennis, Ernest Edwin G. | Louth. |
| Elliott, Oliver Thomas | Leicester. |
| Harris, John Flinton | Bournemouth. |
| Howells, Gwilym Harries | Brecon. |
| Johnson, Walter | Birmingham. |
| Lake, John William | Exeter. |
| McFadden, Wilfred E. W. | Southsea. |
| Phillips, Francis Daniel | Haverfordwest. |
| Price, Charles Hedley | Leominster. |
| Pritchett, William Edward | Chichester. |
| Read, Thomas | Bristol. |
| Roberts, Walter John | Bath. |
| Sadler, Frank William | Ipswich. |
| Sarson, Arthur John | Leicester. |
| Scott, Thomas Lamb | Hetton-le-Hole. |
| Simpson, Arthur | Huntingdon. |
| Stead, Samuel Blower | Widnes. |
| Thorpe, Albert | Boston. |
| Townsend, Percy | Riding Mill. |
| Tytler, William Wallace | Arbroath. |
| Wells, William Luty | Louth. |
| Wicks, Harry Gilbert | Keswick. |

#### STUDENT.

The following, having passed the First examination and tendered his subscription for the current year, was elected a "Student" of the Society:—

| | |
|---|---|
| Alfred Edward Marsh | Luton. |

### Restorations to the Register.

The names of the following persons, who had severally made the required declaration and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Isaac Bailey, 17, Great College Street, Westminster, S.W.
Samuel William Bradbury, 41, Elizabeth Street, Sydney, N.S.W.
John Loveitt Huskinson, 4, Elm Grove, Chichester.
Charles Frederick Pearson, Secunderabad, India.
Joseph Sewell, 91, Lower Marsh, Lambeth, S.W.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

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### Report of the Finance Committee.

This report was of the usual character, and recommended sundry accounts for payment.

The President (as Chairman of the Committee) moved the adoption of the report and recommendations. There was nothing needing special mention with regard to the General Fund, either as to receipts or expenditure. With reference to the Benevolent Fund, subscriptions to the amount of £267 8*s.* had been received, and £127 for ground rents, and it was to be hoped that further subscriptions would be received during the current month, because one of the effects of a contested election, whatever demerits it might have, was that friends of the candidates subscribed to the Fund in order to obtain votes, and it not infrequently happened that they continued to subscribe for a good many years afterwards. In the last month the expenditure, including the annuities, was £583. The donation account remained as it was, and the Orphan Fund had received a donation of one guinea.

The resolution was unanimously agreed to.

### Report of the Benevolent Fund Committee.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow (aged 63) of a member, who has had six previous grants. (London).

£13 to the widow (aged 60) of a registered chemist and druggist, who has had eight previous grants. (Crewe).

£10 to a registered chemist and druggist (aged 83), until recently engaged in a provident dispensary, but now permanently disabled by an accident. (London).

£10 to the widow (aged 57) of a member and subscriber, who was formerly in a business, which had failed owing to the collapse of the City of Glasgow Bank. (Motherwell, N.B.).

£15 to the widow (aged 57) of a registered chemist and druggist, who had been an unsuccessful candidate at the last election of annuitants, and died a month ago. Applicant is almost totally deaf. (Bath).

£10 to a registered chemist and druggist (aged 70), who recently had to close a business he had carried on for upwards of twenty years, as he could neither make it pay or dispose of it. (London).

One application was not entertained.

The Secretary had reported the death of Alfred A. Willison, aged 71, who was on the list of candidates for the approaching election. He also reported that one of the approved candidates was now in a workhouse infirmary, and he was directed to remove her name from the list.

The Vice-President (as Chairman of the Committee) said he had very little to say except to formally move the adoption of the report and recommendations. He had also to announce that in consequence of the death of one of the approved candidates, and the altered circumstances of another, two of the approved candidates for the December election would be erased from the list, and accordingly there would be only eight candidates instead of ten for the four annuities.

Mr. Martindale asked if it was according to the regulations that if a person went into the workhouse he or she should not be eligible for the receipt of an annuity.

The Vice-President said in this case, even if the person obtained the annuity, she could not be so well taken care of as, in her paralysed state, she would be in the workhouse infirmary.

The President said every case depended upon its own merits.

The motion was then put and agreed to.

### Report of the Library, Museum, School, and House Committee.

#### *Library.*

The report of the Librarian had been received including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average |
|---|---|---|---|---|---|
| July . . | Day . . | 438 | 28 | 5 | 17 |
| | Evening . | 131 | 11 | 4 | 7 |
| August . | Day . . | 79 | 8 | 1 | 3 |
| September . | Day . . | 92 | 14 | 2 | 7 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid |
|---|---|---|---|---|
| July . . . . | 185 | 118 | 67 | £0 14*s.* 11½*d.* |
| August . . . | 142 | 71 | 71 | £1 1*s.* 0*d.* |
| September . . | 117 | 48 | 69 | £0 17*s.* 10*d.* |

Donations to the Library had been announced (*Pharm. Journ.*, October 14, p. 311), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the undermentioned works be purchased:—

*For the Library in London—*

Index Kewensis, 4 vols.
Attfield, Chemistry, 15th ed., 1893.
Maisch, Materia Medica, 5th ed., 1893.
United States Pharmacopœia, 1893.

*For the Library in Edinburgh—*

United States Pharmacopœia, 1893.
Brunton, Pharmacology, 3rd ed.
Halliburton, Essentials of Chemical Physiology, 1893.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average |
|---|---|---|---|---|---|
| July . . | Day . . | 447 | 27 | 3 | 17 |
| | Evening | 77 | 9 | 2 | 3 |
| August. . | Day . . | 121 | 10 | 2 | 4 |
| September | Day . . | 126 | 20 | 2 | 9 |

Donations to the Museum had been announced (*Pharm. Journ.*, Oct. 21, p. 330), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Librarian had presented a report on the meeting of the Library Association held at Aberdeen, in September.

The staff of the Society's School had attended and reported on the various classes.

The Committee had recommended that the usual special issue of the Journal be made in February next. Also that 1700 Registers and 950 Calendars for 1894 be ordered.

The Committee had considered an application from the Sheffield School of Pharmacy for materia medica specimens, and, the Curator having reported that he could supply from his duplicates most of the specimens asked for, it was recommended that the request from Sheffield be granted.

The Vice-President (as Chairman of the Committee) moved the adoption of the report and recommendations. He said it was very satisfactory to find that the School was in so flourishing a condition, the influx of students being quite as promising as was usual at this time of year. With regard to the grant of specimens to the Sheffield school, he thought it right to state that provincial schools must recollect that, although the Council was always pleased to do all it could in the way of furthering the cause of education by making donations to the museums and so on it was hardly fair to expect the Society to give what might be called students' specimens for men to handle and pull about in such a manner as to require renewing every few years. The specimens sent by the Society were intended for reference and not for handling, because specimens of that nature might easily be obtained from other sources. He said this in order to prevent misunderstanding, because it was obvious that if applications of this kind came from all parts of the country, the Museum would not be able to meet the demand upon it.

**Mr. SCHACHT** said he should like to put in a plea for a not too rigid interpretation of the conditions which the Vice-President had laid down. He spoke of specimens such as students might handle being easily supplied from other sources, but one of the great objects in view in distributing specimens from that house was that they should be specimens verified by a competent authority, and there was always a great advantage in having such specimens for provincial schools authenticated by the Curator. The Bristol school, which he knew most about, to which the Council had been good enough several years ago to make a grant, although it had not been a very great success, within the last year had been affiliated to the Medical School of Bristol, which had become an integral portion of the University College, Bristol, and was thereby established on a much sounder, broader, and more useful basis, and its position had been recognised by the very highest medical authorities, including Sir Andrew Clark, who recently opened the new building. In their beautifully arranged new museum a proper receptacle had been provided for the materia medica specimens granted by the Pharmaceutical Society. They were now all arranged in a very nice cabinet, where they could be easily viewed without displacement. It was quite true that this was supposed to be a collection for reference, and students were not allowed to handle them, but in discussing the matter with the Professor of Materia Medica he said what a pity it was that they could not have an additional series of drawers containing specimens of the drugs, which students could handle, and so become practically acquainted with their physical characters, without the necessity of the professor being present and opening the cases to show them. This was one of the things they would like to do, and if at some future time he were bold enough to come forward and ask for assistance in providing such a set of specimens, he should hardly like to be met by a rigid rule such as the Vice-President had given expression to, that such specimens must not be handled by the students. He might say that all in the neighbourhood very much appreciated the gift the Society had made, and he believed he was justified in saying that it would be much more largely used in future than it had been.

The **VICE-PRESIDENT** said he did not mean to imply that reference specimens were not to be handled by students. He referred to the breaking up of leaves, barks, and so on.

**Mr. MARTIN** desired to support what had fallen from the Vice-President. He felt, when the application came from Sheffield, that if applications for ordinary drugs were received from every school throughout the kingdom the Society would have to establish, besides the Museum, a drug department with a staff of assistants to put up the specimens which were asked for. With reference to Mr. Schacht's remarks, it was no doubt a great advantage that specimens should receive the verification of the Curator, but he hoped that in every town where a school of pharmacy was established the teachers employed were at least competent to verify the specimens used in their teaching, and although they might refer to Bloomsbury Square in doubtful cases, or with reference to rare drugs, in the case of ordinary drugs used in teaching they should be provided from other sources. The assistance obtained from headquarters should rather take the form of a grant of money to enable the provincial school to provide cases and bottles to preserve the specimens when obtained. In the case of the North of England Association, a grant of money had been made to assist the funds raised from local sources in order to purchase cases and bottles, so that the specimens obtained could be carefully preserved and made available for many years to come.

**Mr. ATKINS** said he agreed with what Mr. Martin had said, with the exception of one point. He did not quite agree with him that the form of grant from the Society should be a money grant only. His idea was that from the Museum in Bloomsbury Square certain specimens could be obtained which could be got from no other source, and therefore he hoped grants would not be restricted to money. He felt sure that if Mr. Schacht had been present at the last Committee meeting he would have arrived at the same conclusion as the Committee after listening to the discussion, which was a very lengthy one. It simply came to this, that there were what might be called commercial specimens of drugs easily obtainable from wholesale houses, which it was not right the Society should be called upon to provide, but that with regard to rarer specimens such applications might be made. That was a broad distinction which might very fairly be made.

**Mr. MARTIN** said that was exactly what he intended to express. He thought the Curator's time was too valuable to be spent in selecting specimens of ordinary drugs.

**Mr. MARTINDALE** thought the selection of typical specimens should be reserved for the Society's Museum as distinguished from those handled by the students. There ought to be two sets of specimens in every museum, one for teaching and the other for reference, and he thought the stock at Bloomsbury Square might be always held in reserve for typical specimens.

**Mr. NEWSHOLME** said he was not quite sure about how the application from Sheffield was framed, but he took it that something was asked for which was different to what was given. He noticed that the Vice-President laid some emphasis on the word "reference," and he believed the specimens were really wanted for that purpose, not to provide material to be pulled about by the students, because they could get plenty of those things in the ordinary way. He did not think there was likely to be any great number of applications for these specimens, or that the Society need fear there would be too great a call made upon the resources of the Museum. There were not very many provincial societies attempting education, and where they did so every encouragement ought to be given. He was quite sure that the specimens now so kindly given would be properly used.

**Mr. HAMPSON** was quite sure the Council did not wish to discourage any educational efforts made in the provinces. He thought the regulations covered everything. The ordinary specimens could be bought out of a money grant, and he did not really see there was anything to discuss. It was quite palpable that any specimens sent down from the Museum ought to be kept for special purposes.

**Mr. NEWSHOLME** said it had been understood that the Society had a great deal of spare material which was not being used.

**Mr. SCHACHT** said his object was simply to deprecate too rigid an interpretation being placed on the doctrine which the Vice-President had enunciated. It was not well to trust to any particular teacher's knowledge of all kinds of drugs. With regard to opium, for instance, there were very many varieties which were not easily obtained and recognised.

**Mr. Abrahams** said as he understood the Society was asked to grant what it could spare from its superfluity, it was not expected to make special purchases for the purpose, and it had not granted anything which could not be given without injuring the Museum.

The **President** said he should support what had been said by the Treasurer to a great extent, but there might be cases where it would be advantageous that even a complete set of students' drugs might be sent, but even then it did not necessarily follow that the Curator should be asked to collect them. The regulations covered nearly every case which could occur. There were towns where sometimes there was a difficulty in getting up a class, and a museum would be of great service to young students, and where an application for assistance was made it might be given either in the form of a money grant for the purchase of specimens or in the direct gift of the specimens themselves. He hoped Sheffield would not be discouraged by anything which had been said. Each case must be discussed on its own merits.

The motion was then put and carried unanimously.

### Divisional Secretary for North Kensington.

The **President** said he had found a letter awaiting him from Mr. Long, of Notting Hill, saying that he was retiring from business and going to live at Reading, and would, therefore, have to resign his office of Divisional Secretary for North Kensington. Mr. Long was an old student of the Society's School; he had had much experience, both at home and abroad, in connection with pharmacy, and since his return home he had always shown himself very loyal to the Society, and desirous of advancing its influence by every means in his power. He was always amusing, and fulfilled the very useful function at annual meetings of saying that which was perfectly true, but which was not always agreeable for a president or official to say. He had the greatest respect for Mr. Long, and appreciated the efforts he had made at the foundation of the Western Association, of which he was for some time President, and, with the sanction of the Council, he would write a letter of thanks to him for his services as divisional secretary. He had to formally put the motion that Mr. Thomas Wood Horsley, 274, Portobello Road, be appointed Divisional Secretary for North Kensington, in the place of Mr. H. Long.

The motion was unanimously agreed to.

### Local Secretaries.

The **President** said nominations for the office of Local Secretary had been sent out in October in the usual way, and the results had been considered by the General Purposes Committee, and summarised in the list of names which had been printed (see p. 374). He now moved that those gentlemen be appointed local secretaries for the ensuing year. In some cases a little difficulty had arisen in dealing with the nominations, especially in new districts. It was very difficult to know what to do where two gentlemen were nominated, and especially when both gentlemen, on being asked, expressed their willingness to serve. Of course the Committee had acted to the best of its judgment in selecting one of the two, and he hoped that no one who had been passed over would feel chagrined at the result. The Committee had frequently found that nominations had been made without any consultation with the gentlemen concerned, and when approved they declined to serve, so that where two were nominated, as happened in some cases in Scotland, and in one in the south of England, each had been asked if he were willing to act. He could only thank those who had expressed their willingness to do so, but who had not been appointed, and express the hope that another year their services would be available.

The motion was carried unanimously.

### Superintendents of Written Examinations.

It was also resolved that Superintendents of Written Examinations be appointed at the same centres as last year, and that the appointments be offered to the local secretaries at those centres.

### Report of the Law and Parliamentary Committee.

This Committee had discussed at considerable length communications from the Nottingham and Notts Chemists' Association and the Edinburgh District Chemists' Trade Association in reference to the medicine stamp duty. Whilst admitting that the administration of the Stamp Acts may in some cases be unequal, the Committee was of opinion that any alteration of the law as it stands would be to the disadvantage of retail chemists and druggists, and not to their advantage. The Committee was further of opinion that it was not politic to take any steps for bringing about an interview between the representatives of chemists and druggists and the Board of Inland Revenue.

The **President**, in moving the adoption of the report, said he hoped the gentlemen both in Edinburgh and Nottingham who had taken an interest in this subject would not suppose that he spoke simply as an individual in the observations he was about to make. The Nottingham society had sent up the communications which had passed between it and the Board of Inland Revenue through their members of Parliament, which indicated that every politeness was shown to those representatives on the part of the authorities at Somerset House. The substance of the correspondence was that those authorities had already on a former occasion invited the Pharmaceutical Society to meet them, and would be glad to do so again. He thought there must be some misunderstanding there, as he did not remember any invitation except one given and accepted by the Trade Association some years ago, when an important deputation waited on the Chairman of the Board and discussed the matter in great detail. But it was not necessary to be introduced by a Member of Parliament in order to see the Chairman or any official of the Board of Inland Revenue. The Society, through its President or officers, could make an appointment to see the highest officials of the Board at any time without any difficulty; those officials made use of the Society's facilities for obtaining information, and treated it as a responsible body having public duties to perform. This subject had been discussed in committee and at the Council many times, and had been more than once referred to at annual meetings. It might be supposed that he personally was prejudiced on the question, but on the previous night it had been fully discussed by a large committee, and the result stated in the report was ultimately arrived at. The suggestions from Nottingham were five in number, and they had all been considered carefully and their respective advantages discussed. They were: 1. It is the custom of the Board to pay the informer a commission on the penalties inflicted. This custom should be abolished. 2. In cases of obvious unintentional infringements (which he supposed meant obviously to the authorities, not to the party who infringed) warning should be given before imposing a modified penalty or taking legal proceedings. 3. That all B.P. preparations, when bearing a label stating them to be such, should be entirely exempt from the operations of the Act. 4. In the case of medicines—other than B P. preparations—in popular demand or of known composition, *e.g.*, chlorodyne, Easton's syrup, etc., it shall be permitted to state on the label the dose to be administered in the various diseases for which they are used. 5. That special exemption with regard to the use of the possessive case should be made where the article bears the name of the originator of the formula for its composition, and not the name of the seller, provided the article is of known composition, and such a list might from time to time be submitted by the Council to the Board. The first two suggestions raised questions of practice, on which the Council were hardly quite competent to give an opinion, as they referred to how the Act should be carried out; but he would remind them that in all Acts of Parliament where revenue was concerned, special powers had always been given. The Society itself had an act to carry out, and it was sometimes said that it ought to adopt the same measures as the Board of Inland Revenue did for discovering infringements. Certainly it was not the province of the Society to go to the authorities and tell them how to carry out an Act of Parliament. He had repeatedly said that where just cause could be shown, the fine paid—which was not paid in open court, and was more in the nature of caution-money than anything else—was generally very small, and he had known cases, where it was proved to the satisfaction of the officers that the offence was an accident, or that there was some difficulty in comprehending the law, in which it had been entirely remitted. He could not help thinking the authorities were fairly considerate in this matter. Of course, he was bound to admit that the annoyance was considerable. There was a certain amount of sentiment in this matter. Perhaps every one at that table had sinned against the Act, either by negligence or want of knowledge, or more or less wilfully from a desire to sail as near to the wind as possible. That was the impression he had formed in cases he had had to investigate. Probably every member of Council had suffered, and no one liked to be fined; and if they were the only body of men to whom the right of vending stamped medicines was conceded, instead of being only one-fifth part, or thereabouts, of the total number, something might be done. But, after all, chemists were but a small body, and any alterations that might be proposed by them, if accepted, would of course apply to every one who held a patent medicine licence. The recommendations with regard to B.P. and certain medicines which were regarded as common property, such as chlorodyne and Easton's syrup, and the possessive case being allowed under certain circumstances, all three more or less hung together. He did not think it would be to the interest of the craft to give all the reasons which led the Committee to the conclusion that it was not desirable to meddle with any of those three points. The conclusion arrived at was, that in these days of fierce competition the balance of advantages, with regard to this curious Act, was slightly in favour of the small chemist and druggist; and feeling that, and knowing that the Somerset House authorities must necessarily remain a body looking out for revenue, the Committee was unwilling to assist in altering the Act in a way which would make it much worse for the trade than it was at present. On these grounds, putting aside questions of sentiment, and whether such an Act ought to exist at all, but looking at it from the point of view of the authorities, as a revenue Act, it seemed to the Committee undesirable to move in the matter, because it was considered that those who were stirring in this matter would only succeed in doing the whole trade, and especially the small chemist and druggist, considerable damage. Of course, this was difficult to prove; all prophecies were; but the men at that table represented the trade as well as any body of men who could be found, and were quite as competent to deal with the trade as any other association. The majority of the Committee which had met on the previous night were not Londoners; they came from different parts of the country; and though there might be slight differences of opinion, practically the Committee as a whole came to the conclusion that it was undesirable to move. Not that they were unwilling to do so if desirable, because the President and officers had done much in that way in former years. The Council was ready to go anywhere on a deputation, or otherwise, where the interests of the trade were to be benefited; but, as men of experience and knowledge of the subject, the members came to the conclusion that it was better not to interfere.

Mr. **Bottle** said he had not had the privilege of attending the Committee meeting, but he fully agreed in the view taken of this matter. He was quite aware that there were anomalies in the Medicine Stamp Act, which one would like to see improved or amended; but, on the other hand, he should hesitate very much to move in the direction their Nottingham friends desired. It would be very inconvenient if the Society took up any such position.

Mr. **Martindale** said there was a great hardship which most of their friends in the country suffered from, and that was the unequal incidence of the Act. In many cases a man suffered, while others by their cleverness and ability seemed to be able to evade it in a way which the Act did not intend. He fully agreed with what the President said generally, and would rather submit to the Act as it was than have it tinkered with or abolished altogether. If it were altered it would be rather in the way of having it extended than that it should be abolished. Still there was no question of this, that not being able to put directions for use on ordinary preparations sold by chemists was a deterrent to the purchasers. If they found on a bottle of tincture of rhubarb simply the dose, and no directions for use, they would say it was no use buying that; there were no directions how to take it, or in what case to use it. If a stamp was put on that could be done, but then you labelled yourself as a quack at once. He could not help thinking that they suffered a great inconvenience, and it was a very obnoxious tax, but they were bound to submit to it in the pleasantest way possible. The exemptions seemed to him the greatest difficulty. There was one exemption which seemed very harrassing, viz., that all foreign medicines, except drugs, were now exempt from the incidence of the Act. The Act as drawn up, in the schedule, was to the effect that foreign medicines, except drugs, no matter what the manufactured article was, were to be stamped; but they now had foreign medicines from the continent and America which came in without any duty at all. There was no reciprocity in this matter, and pharmacists suffered a great deal from this inequality. Although he quite agreed with what the President said, still he could not help feeling that their Nottingham friends and others did feel the harrassing mode in which the Act was carried out. At the same time he saw no alternative.

Mr. **Hampson** said he heartily agreed with the conclusions of the Committee. The President had already referred to the fact that they had all experienced the disagreeable effect of this Act of Parliament, but looking at it all round he was persuaded it would be unwise to attempt new legislation or to interfere with the carrying out of the Act. He himself had paid the penalty, and richly deserved it. He felt it was simply a mistake on his part, but he had been robbing the Inland Revenue inadvertently for many years, and the penalty was reduced because the authorities were satisfied that he had acted under a mistake, and he had not the least sense of annoyance in the result. Still, if they had come before and warned him he should have been better pleased, because he desired to obey the law. With regard to the introduction of patent medicines from abroad he did not think Mr. Martindale was correct. Many foreign medicines were sold in this country, but unless for dispensing purposes they occupied exactly the same position as other medicines. With regard to the alleged inequality of the law, or its application, it was simply the fact that some very clever persons were able to frame labels for their articles which would pass the ordeal, and any person equally clever could do the same thing. On the other hand, it would be absolutely mischievous to accept the suggestions now made, and endeavour to carry them out. It would simply be a great disadvantage to chemists themselves, as it would allow general dealers to carry on this kind of business with much greater facility. He hoped their friends at Nottingham, after this discussion, would review their position, and he thought they would recognise that no real good would be done by supporting their suggestions.

Mr. **Atkins** said he had only a word or two to say, and that rather reluctantly, because he was not quite in accord with the majority of the Council. He should certainly accept the report of the Committee as a whole, though he was unable to be present during the whole of the discussion, and therefore did not know what arguments were brought forward after he left. He wished to say, however, that he quite believed what the President said, that he had had the most ready access to the officials at Somerset House. It was generally believed that the President was very potent in influence—he would not say he was prejudiced—but on this question he had formed a very strong opinion, and he could quite imagine, although he did not know what he might have said to the chief of the department, that after listening to him he would say the President must represent the Society, and that there the matter would rest. With regard to the great majority of the suggestions, he entirely disagreed with them, but there was one which had his sympathy to a great extent, though how far it would be workable he would not attempt to say. That was No. 2, that in cases of obviously unintentional infringement a warning should be given before imposing a modified penalty or taking legal proceedings. Of course, as the President had said, it must mean obviously unintentional to the authorities. On the question of revenue, he believed that the department would not concede that, nor did he think they should; if anything should be called upon to pay duty directly or indirectly it should be empirical medicines, but he had always thought it would be far better to raise the revenue by a heavier licence, which would shut out nine-tenths or more of the competition which the President had referred to, and was now pressing so hardly on the small traders. It was a miserable thing, reducing the licence down to a point at which every little shopkeeper who chose could sell patent medicines. The Revenue must be maintained, but he would maintain it in that direction. What he felt was this, that where men were guided by sound principle, as there were many, including many chemists, who would not under any consideration knowingly break the law, and they had broken it and had been fined, it was not a question of simply a label with only the possessive case upon it, but being quite innocent in intention, they had broken the law and been fined. A friend of his who was in that position said he did not care a rap about the guinea or two guineas, but it was the fact of being fined which distressed him. He did think if the Department was more considerate than it was in that matter of obviously unintentional infringements it would be better. Men felt a sense of humiliation in being held to be law breakers, and he should be glad if he could influence the President's mind in any way so that he could induce the authorities to be a little more forbearing in that matter.

Mr. **Allen** also heartily endorsed the decision of the Committee, and did so all the more readily because this matter had been under consideration now for some years; it was not a new subject. The gist of the whole question lay in the fact that chemists were no longer the principal retailers of proprietary medicines. They were the minority, and anything which widened the doors and allowed freer traffic in these articles must of necessity open the door wider for the outsider. He could give reasons if necessary, for believing that each one of these suggestions, if adopted, would be to the detriment of his struggling brethren. He did not agree with Mr. Martindale. He had to get his living by retail pharmacy, and he did not find the incidence of the patent medicine stamp caused the slightest hardship. If it were a perfectly new question it would be a different matter. He was bound to say that the authorities treated everyone who came to them with the greatest consideration possible, and though he had come under their notice, and had had fines to pay, he did not feel annoyed. At the present time, with the help of a little book which had been published, and with the aid which the revenue authorities were always ready to afford, there seemed to him no excuse for anyone going wrong. Directions for use might be put on a label to any extent; what you might not do was to put the diseases for which it was used, which was a very different thing, and was altogether outside the province of the chemist.

Mr. **Martin** said the Committee had spent a good deal of time over this question, and he deprecated in this case, as in many others, a long discussion in open Council. It was a delicate matter to handle, and things were said which it would be much better not to publish. If the members had not confidence that the men they elected would use their time, brains, experience, and judgment in dealing with such matters, without discussing them over again in open Council, they should choose others in whom they had confidence. A great deal of the criticism passed upon the Council came from those who did not belong to the Society, and had no right to express any opinion about its action. With regard to this particular question of exemptions, the possessive case, and so on, he felt very strongly. With regard to B.P. preparations, if a man put "Jones's Tincture of Ginger, prepared according to the B.P.," did he not mean to convey the idea that Jones's tincture was a better tincture than anyone else's, and to endeavour to obtain a kind of proprietary right? Then he wanted to put on directions for use and to suggest the diseases for which they should be employed, according to his knowledge—Jones's knowledge; and that again meant establishing proprietary rights and an enhanced pecuniary value, and where this was done the authorities were perfectly right to obtain revenue from these things. As to the use of a stamp labelling themselves as quacks, if they did these things they were quacks, whether the Inland Revenue authorities called them so or not. With regard to Mr. Atkins' friend, who was so hypersensitive that he was considerably pained at having broken the law, would not his pain have been exactly the same, and ought not he to have gone into his closet and repented over his sin in breaking the law just the same if he had been warned instead of being fined? The fact was, in this, as in many other cases, men were sensitive because they were detected and punished. He had no sympathy with that hypersensitiveness. He had been glad to hear the confessions of one or two of his friends round the table, and he should take home the comforting feeling that some of the anonymous sums which they saw sent to the Chancellor of the Exchequer as conscience money represented stamp duties which ought to have been paid years ago.

Mr. **Young** said he was not quite sure that he agreed with Mr. Martin in one particular, because he saw no possible objection to the ventilation of a subject like this in council. Of course, the order of things changed from time to time, and a discussion that was old and possibly wearisome to one was entirely new to him, and would be new every year as the complexion of the Council changed. It was possible even that views held by gentlemen one year might be more or less modified another. At the same time, he must confess his general adhesion to the resolution come to. With reference to the possessive case he really saw no hardship at all; it was a little irritating, but he might suggest that the penalty paid by Mr. Atkins' friend would go far to provide a new set of labels, which would do away with any such danger. It was so easily overcome by the expenditure of a few shillings on a little book and half an hour's consideration, that it would be almost puerile to go to a representative body with such a slight grievance. With reference to labelling the doses of ordinary B.P. preparations, such as sal volatile, tincture of rhubarb, etc., as he had said in committee, it would be exceedingly impolitic. At the present time the dose could be stated, but it was said it would be better if they could describe the uses to which the drugs were to be put; but on the other hand, if you were to describe every quality of a drug and its dose and use, you placed the grocer on an equal footing; and the customer who now came to the chemist for tincture of rhubarb and asked for the information which he kindly gave him, would no longer be under that necessity, but would go and buy the article, *plus* the information, at a grocer's shop, at a lower price.

Mr. **Martin** said he did not deprecate discussion by new members in committee, what he deprecated was many of these things being stated in public.

Mr. **Richardson** had listened to the discussion with very great pleasure, and quite agreed that anyone approaching the Somerset House authorities was always received with very great courtesy. He entirely disagreed with Mr. Atkins as to the sentiment of these people who were found out. There was a very similar case in Leicester lately, where one of the largest hosiers had been found out adulterating what he termed "natural wool" goods with 59 per cent. of cotton. Of course his sentiments were very much affected, but he had been carrying on this unholy trade for ten or fifteen years, and had augmented his profits very considerably by that method. It was exactly the same with a chemist who attempted to do anything of that sort, the sooner these men were brought to justice the better for the moral and high-class chemist who conducted his trade in a legitimate way. It would be very undesirable to attempt to interfere with the Stamp Act, which was a great protection to the legitimate chemist, and to some extent prevented the grocer infringing upon his rights.

Mr. **Abraham** said if this question had not been so much discussed he should have been inclined to allow the recommendation of the Committee to pass without expressing any opinion upon it, but as it had been discussed rather fully he should like to state his views. He took a different view of this subject, mainly because he regarded the Medicine Stamp Act, not as the President did, as beneficial, but as an unmitigated evil. He quite believed that four-fifths of the sellers of patent medicines were not chemists, and possibly the sales of proprietary medicines were roughly in the same proportion, and that loss of trade was consequent upon the Medicine Stamp Act. It gave a guarantee which would not otherwise be obtained, and had been the direct cause of the chemist losing that amount of trade. It was merely on the ground of his general opposition to the Act, which he believed was contrary to the spirit of the age and highly mischievous to all classes of the community, that he would attempt now to mitigate the evil by frittering it away as much as possible, and at least allow the chemist freedom with regard to purely pharmaceutical preparations.

Mr. **Hills** said he fully agreed with what the President had said, and those two or three who had been at all in opposition had been answered by others. Mr. Martindale had referred to inequalities in the operation of the Act, and if there were such cases they ought to be brought before the authorities, but he had not given any, and that was not a point under discussion.

The **President**, in putting the motion, said he had come across a great many suggestions from the Inland Revenue authorities for altering the law; he had not been asked what he thought of them officially or otherwise, but he knew what was running through the minds of those officials who had to deal with this matter at the request of the Chancellor of the Exchequer, and he might say that the alterations they would like to propose in the Act would not be beneficial, and did not command his sympathy as President of the Pharmaceutical Society. That was one reason why he preferred not beginning to put the pruning knife into the old Act. In the ordinary affairs of life such precaution was accepted by business men as a good reason, and on that alone he asked his friends at Nottingham to accept what he said. He could say a great deal more, but he agreed very largely with Mr. Martin, that it was not desirable to say too much. They must not encourage the authorities to take away a certain portion of their business by an indirect method. These gentlemen probably forgot that the reduction in the medicine licence was brought about by letters published in the *Pharmaceutical Journal*. He believed the general view in the trade now was that it would be an advantage if the licence were considerably increased, but of course the authorities had to consider whether they would gain as much money in that way. It was better not to give too many reasons, either in open Council or anywhere else, to show why it was better not to interfere with what after all was a comparatively poor living for the chemist and druggist. It was true the law gave him no restrictive title to sell medicines, but only the right to call himself chemist and druggist, and to dispense and compound poisons; but the spirit not only of the Medical Council but of the intelligence and sense of the community, was rather in favour of according him the sole right of dealing in drugs and compounding preparations, and indirectly this Act did conduce to that. Any alteration which could be suggested at the present moment would, he thought, be disastrous, if he were right in supposing, as he did, that in the present state of things the Act was a slight advantage, and sometimes a material advantage to the registered person.

The resolution was then put and carried *nem. con.*

### Report of Examinations.

*October*, 1893.

| | Candidates. | | |
|---|---|---|---|
| | Examined. | Passed. | Failed. |
| England and Wales:— | | | |
| Major . . . . . . | 18 | 7 | 11 |
| Minor . . . . . . | 159 | 51 | 108 |
| Modified . . . . . | 1 | 1 | 0 |
| Total . . . | —178 | —59 | —119 |
| Scotland:— | | | |
| Major . . . . . . | 4 | 2 | 2 |
| Minor . . . . . . | 86 | 40 | 46 |
| Modified . . . . . | 1 | 1 | 0 |
| Total . . | —91 | —43 | —48 |

### *First Examination.*

Twenty-two certificates were received in lieu of the Society's First examination.

### DATES OF EXAMINATIONS.

It was resolved that the Boards of Examiners meet for the purpose of conducting the oral portion of the examinations in the months of January, April, July and October in 1894 and 1895.

### APPOINTMENT OF ARCHITECT AND SURVEYOR.

The **PRESIDENT** read a letter which had been received from Mr. George Arthur Lansdown, applying for the appointment of architect and surveyor to the Society in succession to his late father and partner. He knew that Mr. Lansdown's qualifications were of the highest class, and moved that the appointment be conferred upon him.

Mr. **HAMPSON** seconded the motion.

Mr. **SOUTHALL** asked if this would prevent the Society employing another architect at any time if it was thought desirable.

The **PRESIDENT** said not at all. There was no fee attached to the office except for work done, but in connection with the purchase of ground rents it was necessary from time to time to consult a surveyor.

The resolution was unanimously accepted.

### REGULATIONS OF THE BENEVOLENT FUND.

The **VICE-PRESIDENT** then moved the following resolution, of which he had given notice:—

> "That the Benevolent Fund Regulations be amended as follows:—After the words 'benefits of this Fund,' in Regulation No. 12, insert: 'If the circumstances of the pensioner do not appear to the Council to *wholly* disqualify him or her from receiving the benefits of the Fund, the Council may, at its discretion, vary the amount of his or her annuity.'"

He said he need hardly explain that the present regulation provided that under certain circumstances the annuity to which a person had been elected might be withheld or taken away, but under that regulation there was no power given to the Council to reduce the amount. The class of people who were elected, although very poor and almost destitute, belonged to a good status in the community, and it sometimes happened that their circumstances improved—a distant relative might die and leave them a little money, which in some cases rendered them wholly independent of the Benevolent Fund, and it would be manifestly unfair in such circumstances to continue the annuity. Having special regard to the increase recently made in the annuities it became obvious that sometimes cases might arise in which it would be impossible to take away the whole annuity and yet at the same time unfair to other poor people who wanted assistance that the full amount should continue to be given. In such cases a reduction might meet the justice of the case. He was glad to say that the Benevolent Fund Committee with which he had discussed the matter was practically unanimous in favour of his suggestion. He did not advocate the continual peering into the position of annuitants year by year, or interfering with them because they happened to have a gift of £5 or £10, but there was a case where an annuitant had become entitled to some thousands, and it was obviously unfair that in such a case the annuity should be continued. This regulation was to meet a case where a person had a small addition to his or her income, but not sufficient to justify the withholding of the annuity altogether, and at present there was no alternative.

Mr. **HAMPSON**, in seconding the resolution, said the rules provided that if an annuitant had the good fortune to have his or her income enlarged, the Council would of necessity have to discontinue the payment of the annuity. Last year it was decided that an application should be made annually to each annuitant to restate his or her financial position, and that seemed to necessitate a regulation of the kind now proposed. He was quite sure the Committee would carry it out with great tenderness and consideration. Of course it would throw considerable responsibility on the Committee, but he was quite sure it would not be abused.

Mr. **ALLEN** pointed out that the resolution recently carried, providing that annuitants should furnish some statement of their position every year, rendered a provision of this kind absolutely necessary.

Mr. **ATKINS** said Mr. Allen had put the matter very clearly. Considering the immense and growing claims on the Fund, the Committee had a right to know if any of those receiving benefits from it had any accession to their means, and he was quite sure that the Committee would deal with each case fairly and even tenderly, and would not begrudge the extra time which would be required. He was not quite sure that the Committee would have power, if this resolution were passed, to revert to the original annuity after once reducing it, if the circumstances of the case again altered, and he thought that should certainly be possible. The amount of the annuities having been increased so generously, it was necessary to dispense the Fund with the greatest care.

Mr. **SOUTHALL** thought it would be extremely difficult to carry out this regulation. At present the Committee had power to suspend the annuity if the annuitant were provided for from other sources, but it would be very difficult to say that one who had a slight addition made to his means should have his annuity reduced. In such a case he thought the person in question might be allowed to enjoy his good fortune for the short remainder of his life.

Mr. **HILLS** said he felt rather in accord with Mr. Southall. It seemed to him rather undesirable to interfere where there was only a small accretion of income, and where it was really substantial, of course the annuity would be discontinued. At the same time if the Committee were practically unanimous on the question, and were willing to undertake the responsibility, he should not object. It was important, however, that the point raised by Mr. Atkins should be attended to.

The **PRESIDENT** said he thought the Committee would at any time have power to rescind any resolution they had passed for reducing an annuity.

Mr. **BOTTLE** suggested that the word "vary" should be substituted for "reduce," which would make it quite clear, and with this amendment the resolution was put and carried.

### REPORT OF THE GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitor, stating the progress made with cases which had been placed in his hands. Several penalties had been recovered, and a good many defendants had paid penalties and costs before trial. It also reported the result of the application in *re* Sleight's patent, which is printed at p. 377.

A large number of cases of infringement of the Pharmacy Act were considered, and it was recommended that the Registrar be authorised to take proceedings against the offending parties.

The Committee had considered the nominations for Local Secretaries, and approved of the appointment of the persons named in the list.

The Council went into committee, as usual, for the reading and consideration of the legal portion of the above report.

On resuming, the report and recommendations were unanimously adopted, and resolutions were passed authorising the Registrar to institute proceedings against certain persons named therein.

### LIST OF LOCAL SECRETARIES.*

| District. | Local Secretary. |
|---|---|
| Aberdeen | Strachan, Alexander. |
| Aberystwith | Wynne, Edward P. |
| Abingdon | Smith, William F. |
| Altrincham | Foden, Joel. |
| Andover | Bienvenu, John. |
| Arbroath | Robertson, John. |
| Ashbourne | Bradley, Edwin S. |
| Ashford | Ingall, Joseph. |
| Ashton-under-Lyne | Bostock, John W. |
| Aylesbury | Palmer, Edwin T. |
| Banbury | Bartlett, Hubert. |
| Banff | Alexander, William. |
| Bangor | Jones, Owen. |
| Barking | Ridley, Charles H. |
| Barnet | Young, R. Fisher. |
| Barnsley | Eastwood, Lewis. |
| Barnstaple | Goss, Samuel. |
| Barrow-in-Furness | Chapman, Leonard P. |
| Bath | Appleby, Edward J. |
| Bedford | Taylor, James B. |
| Belper | Calvert, James. |
| Berwick | Lyle, William. |
| Birkenhead | Brookes, Alfred Fincher. |
| Birmingham | Thompson, Charles. |
| Bishop Auckland | Dobinson, Thomas. |
| Blackburn | Garland, Alfred P. |
| Blackpool | Laurie, John. |
| Blandford | Groves, Richard H. |
| Bodmin | Cardell, Richard T. |
| Bolton | Blain, William R. |
| Boscombe | Endle, Frederick. |
| Boston | Grimble, Albert. |
| Bournemouth | Toone, John A. |
| Bradford (Yorkshire) | Rimmington, George. |
| Brecon | Meredith, John. |
| Brentford | Wood, Alexander. |
| Bridgnorth | Deighton, Thomas Milner. |
| Bridgwater | Basker, John Anthony. |
| Bridlington | Purvis, John B. |
| Brighton | Gwatkin, James Ross. |
| Bristol | Stroud, John. |
| Burnley | Cowgill, Bryan H. |
| Burslem | Blackshaw, Thomas. |
| Burton-on-Trent | Wright, George. |
| Bury St. Edmunds | Summers, Frank. |
| Buxton | Wright, Robert. |
| Camborne | Allan, Charles J. |
| Cambridge | Deck, Arthur. |
| Canterbury | Bing, Edwin. |
| Cardiff | Munday, John. |
| Carlisle | Hallaway, John. |
| Carmarthen | Lloyd, Walter. |
| Carnarvon | Jones, John. |
| Castle Douglas | Veitch, Andrew. |
| Chatham | Morgan, Alfred William. |
| Chelmsford | Metcalfe, Wilson. |
| Cheltenham | Barron, William. |
| Chester | Shepheard, William F. J. |
| Chesterfield | Windle, John T. |
| Chichester | Long, William Elliott. |
| Chippenham | Coles, John Coles. |
| Chorley | Hill, William. |
| Cockermouth | Cooper, F. Ashley. |
| Colchester | Cordley, William Bains. |
| Coventry | Hinds, James. |
| Crewe | Mason, Edgar. |
| Cromer | Hoare, William Parker. |
| Croydon | Clarke, Josiah. |
| Cupar | Guthrie, Thomas. |
| Dalkeith | Storie, Robert. |
| Darlington | Robinson, James. |
| Dartford | Goff, Walter E. |
| Darwen | Shorrock, Ralph. |
| Deal | Green, John. |
| Derby | Cope, John A. |
| Devizes | Edwards, Thos. Roberts. |
| Devonport | Rendle, Richard H. |
| Dolgelly | Williams, Richard Wynne. |
| Doncaster | Howorth, James. |
| Dorking | Evans, Edgar M. |
| Douglas (Isle of Man) | Radcliffe, John C. |
| Dover | Bottle, Alexander. |
| Droitwich | Harris, Stephen. |
| Dudley | Gare, Charles Hazard. |
| Dumfries | Allan, William. |
| Dundee | Hardie, James. |
| Dunfermline | Seath, Alexander. |
| Duns | Gunn, William. |
| Durham | Sarsfield, William. |
| Ealing | Curtis, Frederic G. |
| Eastbourne | Crook, Herbert. |
| East Grinstead | Tully, John. |
| Eccles | Howie, William Lamond. |
| Egremont (Cumberland) | Ireland, Edward J. |
| Elgin | Robertson, William. |
| Enfield | Gange, George. |
| Epping | Rowland, Thomas W. |
| Evesham | Pumphrey, John Henry. |
| Exeter | Lake, John Hinton. |
| Falkirk | Murdoch, David. |
| Falmouth | Newman, Walter Francis. |
| Fareham | Batchelor, Charles. |
| Faversham | Laxon, Matthew. |
| Finchley | Freeman, Frederick Wm. |
| Flint | Jones, Owen Williams. |
| Folkestone | Lea, Frederick James. |
| Forfar | Fowler, George R. |
| Frome | Green, Edmund C. F. |
| Gainsborough | Surfleet, Arthur George. |
| Galashiels | Ross, William. |
| Gateshead | Maillard, Ralph W. |
| Glasgow | Kinninmont, Alexander. |
| Gloucester | Slinn, Harry E. |
| Goole | Timm, Edmund. |
| Grantham | Whysall, William. |
| Gravesend | Clarke, R. Feaver. |
| Greenock | McNaught, Archibald. |
| Grimsby, Great | Cook, Robert. |
| Guernsey | Nickolls, John B. |
| Guildford | Long, Alexander J. T. |
| Haddington | Watt, James. |
| Halifax | Seely, Herbert W. |
| Hanley | Cornwell, Thomas C. |
| Harrogate | Davis, R. Hayton. |
| Harrow | Gunn, Samuel John. |
| Harwich | Worts, Augustine. |
| Hastings and St. Leonards | Tharle, Charles A. |
| Hawick | Maben, Thomas. |
| Helensburgh | Harvie, George. |
| Hendon | Goldfinch, George. |
| Henley-on-Thames | Batchelor, Charles J. H. |
| Hereford | Williams, Walter. |
| Hertford | Lines, George. |
| Hexham | Gibson, John Pattison |
| Hitchin | Ransom, William. |
| Honiton | Dyer, Edward H. |
| Horncastle | Kemp, Herbert W. |
| Hornsea | Morrow, Charles. |
| Houghton-le-Spring | Rowell, Robert H. |
| Huddersfield | King, William. |
| Hull | Bell, Charles Bains. |

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* Local Secretaries are appointed in all towns in Great Britain (except London and Edinburgh) which return a Member or Members to Parliament, and in such other towns as contain not less than three Members of the Society or Associates in Business.

| District. | Local Secretary. |
|---|---|
| Huntingdon | Baxter, Robert. |
| Huntly | Chalmers, George. |
| Hythe | Lemmon, Robert Alce. |
| Ilfracombe | Crang, Walter. |
| Ilkley | Worfolk, George W. |
| Inverness | Bethune, William J. |
| Ipswich | Anness, Samuel Richard. |
| Jersey | Cole, George. |
| Keighley | Kershaw, Arthur N. |
| Kendal | Severs, Joseph. |
| Kilmarnock | Borland, John. |
| King's Lynn | Palmer, William J. |
| Kingston-on-Thames | Walmsley, Samuel. |
| Kinross | Dow, William. |
| Kintore | Keith, Alfred G. |
| Kirkcaldy | Storrar, David. |
| Kirkwall (Orkney) | Stewart, Duncan. |
| Knaresborough | Lawrence, William P. |
| Knutsford | Silvester, Henry T. |
| Lancaster | Vince, James. |
| Leamington | Barrett, Josephus T. |
| Leeds | Reynolds, Richard. |
| Leicester | Clark, Walter Beales. |
| Leigh (Lancs.) | Bennett, John William. |
| Leighton Buzzard | Richmond, Robert. |
| Leith | Garvie, Alexander |
| Leominster | Sandiland, Robert B., Junr. |
| Lewes | Saxby, Henry. |
| Leytonstone | Bennett, Cornelius. |
| Lichfield | Perkins, John Jaquest. |
| Lincoln | Birkbeck, John Thomas. |
| Liverpool | Parkinson, Richard. |
| Llandudno | Winter, Joseph. |
| Llanrwst | Jones, Owen. |
| Longton | Prince, Roland. |
| Loughborough | Charles, Wm. Frederick. |
| Louth | Dennis, Fred Woodrow |
| Lowestoft | Clarke, Geo. Ernest. |
| Ludlow | Woodhouse, George. |
| Luton | Duberley, George S. |
| Macclesfield | Wright, John. |
| Maidenhead | Walton, Ralph. |
| Maidstone | Stonham, William B. |
| Maldon | Crick, George E. |
| Malton | Buckle, James. |
| Malvern | Coldwell, David B. |
| Manchester, etc. | Kemp, Harry. |
| Mansfield | Patterson, Douglas J. |
| March | Davies, Peter Hughes. |
| Margate | Harvey, William Sutton. |
| Market Harborough | Maynard, Henry R. |
| Melton Mowbray | Wing, Geo. N. |
| Merthyr Tydvil | Smyth, Walter. |
| Middlesborough | Robson, J. Crosby. |
| Middleton (Lancs.) | Parker, James H. |
| Molton, South | Swingburn, Richd. Hy. |
| Morecambe | Fell, John James. |
| Morpeth | Schofield, Fredk. E. |
| Motherwell | Martin, James |
| Newark | Cherrington, Geo. W. |
| Newcastle-on-Tyne | Proctor, Barnard S. |
| Newcastle-under-Lyme | Poole, Weston. |
| Newmarket | Barrow, Frank Arthur. |
| Newport (Mon.) | Garrett, Thomas P. |
| Newton Abbot | Bibbings, John Henry. |
| Newtown | Owen, Edward. |
| Northampton | Bingley, John. |
| Northwich | Humphreys, Griffith. |
| Norwich | Sutton, Francis. |
| Norwood | Birch, Henry C. |
| Nottingham | Parker, William Henry. |
| Nuneaton | Iliffe, George. |
| Oakham | Wellington, James. |
| Oban | Robertson, Alexander |
| Oldham | Bates, Henry. |

| District. | Local Secretary. |
|---|---|
| Oswestry | Evans, John. |
| Otley | Lockwood, Thomas. |
| Oxford | Prior, George Thomas. |
| Paisley | MacCowan, Robert Thos. |
| Pembroke Dock | Williams, Cornelius. |
| Penrith | Cowper, Joseph. |
| Penzance | Shakerley, Benjamin. |
| Perth | Donald, David. |
| Peterborough | Heanley, Marshall. |
| Peterhead | Tocher, James F. |
| Petersfield | Edgeler, William B. |
| Plymouth | Hunt, Freeman W. |
| Pontefract | Bratley, William. |
| Pontypridd | Arnott, Daniel. |
| Portobello | Allan, David (Musselburgh) |
| Portsmouth, etc. | Brewis, Thomas. |
| Preston | Stuart, William. |
| Prestwich | Mercer, Allan. |
| Ramsey (Hunts) | Palmer, Frederick Wm. |
| Ramsgate | Baily, Edward |
| Reading | Bradley, Charles. |
| Reigate | Woodward, Moses M. |
| Rhyl | Lawrence, Geo. Richard. |
| Richmond (Surrey) | Thacker, William. |
| Richmond (Yorks) | Walton, E. Bridges. |
| Ripon | Parkin, Joseph Brooks. |
| Rochester | Wyatt, Charles Frederick. |
| Romford | Lasham, John William. |
| Ross | Matthews, Thomas A. |
| Rotherham | France, Joseph. |
| Rothesay | Duncan, William. |
| Rugby | Brown, Frederic P. |
| Ruthin | Rouw, Theodore J. |
| Ryde (Isle of Wight) | Pollard, Henry Hindes. |
| Rye | Waters, William Allen. |
| St. Albans | Ekins, Arthur, E. |
| St. Andrews | Kermath, William R. |
| St. Austell | Binks, Burcham. |
| St. Helens | Wallbridge, John George. |
| St. Ives (Cornwall) | Young, Tonkin. |
| Saffron Walden | Gilling, John. |
| Salisbury | Atkins, William Ralph. |
| Scarborough | Whitfield, John. |
| Sevenoaks | Pain, Edwin. |
| Sheffield | Ward, William. |
| Shields, South | Noble, John. |
| Shipley | Dunn, Henry. |
| Shrewsbury | Cross, William Gowen. |
| Slough | Griffith, Richard. |
| Southampton | Dawson, Oliver R. |
| Southend-on-Sea | Powers, Edward. |
| Southport | |
| Spalding | Bell, E. Wightmar. |
| Stafford | Averill, John. |
| Stalybridge | Simpson, Allwood. |
| Stirling | Shairp, William. |
| Stockport | Orton, Wm. Billing. |
| Stockton-on-Tees | Brayshay, Thomas. |
| Stoke-on-Trent | Adams, Frank. |
| Stone, Staffs | Jacks, Frederick. |
| Stonehaven | Wood, A. Lyon. |
| Stonehouse (Devon) | Maitland, Frank. |
| Stourbridge | Selleck, William R. |
| Stowmarket | Gostling, George James] |
| Stranraer | Ker, Richard. |
| Stratford | Holford, Thomas C. |
| Stratford-on-Avon | Hawkes, Richard. |
| Streatham | Shacklock, James H. |
| Stroud | Coley, Samuel James. |
| Sunderland | Ranken, Charles. |
| Swaffham | Bell, Frederick R. |
| Swansea | Grose, Nicholas M. |
| Sydenham, Upper | Wilson, Alexander W. |
| Tain | Fowler, Donald. |
| Tamworth | Allkins, Thomas Boulton. |

| District. | Local Secretary. |
|---|---|
| Taunton | Short, George William. |
| Tavistock | Gill, William. |
| Teddington | Stacey, Peter. |
| Teignmouth | Maunder, William. |
| Tiverton | Havill, Paul W. |
| Torquay | Shapley, Charles. |
| Totnes | Morse, Charles H. S. |
| Tottenham | Tanner, Alfred E. |
| Treherbert | Richards, Thomas. |
| Truro | Percy, Thomas Bickle. |
| Tunbridge Wells | Howard, Richard. |
| Twickenham | Peake, Henry F. |
| Uxbridge | Coles, Arthur. |
| Ventnor | Weston, Charles. |
| Wakefield | Chaplin, John Henry. |
| Walsall | Elliott, George. |
| Warrington | Greenough, Hugh F. |
| Warwick | Pratt, Henry. |
| Watford | Chater, Edward Mitchell. |
| Wednesbury | Gittoes, Samuel James. |
| Wellington (Salop) | Hall, Joseph. |
| Wellington (Somerset) | Windeatt, George John. |
| West Bromwich | Roberts, George. |
| Westbury | Paine, Charles. |
| Weston-super-Mare | Hall, Edwin. |
| Whitby | Stevenson, John. |
| Whitehaven | Kitchin, Archibald. |
| Wick | Miller, Kenneth. |
| Wigan | Phillips, Jonathan. |
| Wimbledon | Spencer, William George. |
| Winchester | Chaston, Alfred Edward. |
| Windsor | Russell, Charles J. L. |
| Wolverhampton | Gibson, Frederic John. |
| Woodbridge | Betts, Alick Stephen. |
| Worcester | George, Henry. |
| Worthing | Cortis, Arthur Brownhill. |
| Wrexham | Edisbury, James Fisher. |
| Wycombe | Wilford, Josiah. |
| Yarmouth, Great | Poll, William S. |
| Yeovil | Wright, Alfred. |
| York | Sowray, Joseph. |

### ASSISTANT LOCAL SECRETARIES.

| | |
|---|---|
| North Birmingham | Prosser, F. H. |
| South Liverpool | Smith, J. |

## Proceedings of Societies in London.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting was held at 103, Great Russell Street, on Thursday, October 26, the President, Mr. E. F. Harrison, in the chair. After the usual preliminary business, Mr. E. J. Parry, B.Sc., was called upon to read a paper on "Water Analysis." In this the subject was dealt with at considerable length, the methods of physical, chemical, and biological examination being all considered in turn. Subsequently, there was a prolonged discussion, in which the President and Messrs. Pears, Millard, Gane, Jones, Fell and Sage took part, and after a detailed reply from Mr. Parry, the meeting terminated.

### ROYAL MICROSCOPICAL SOCIETY.

A meeting of the above Society was held on Wednesday, October 18, A. D. Michael, Esq., F.L.S., President, in the chair.

Mr. J. G. Grenfell described some marine diatoms, recently found at Plymouth, belonging to the genera *Melosira* and *Surirella*, which were of interest owing to the presence of pseudopodia.

Mr. A. W. Bennett objected to the term pseudopodia being applied to these processes unless it could be shown that they were actual prolongations of the internal protoplasm.

Mr. T. Comber said that Professor Grunow was of the opinion that the processes were spines.

Mr. E. M. Nelson exhibited and described a new model of a microscope by Messrs. Watson.

Mr. F. Chapman read Part V. of his paper on the "Foraminifera of the Gault of Folkestone."

Professor Bell gave a *resumé* of a paper by Dr. K. L. Maddox "On Progressive Phases of *Spirillum volutans*." The author had traced the development of this organism, and had discovered some points which appeared to be entirely new in the history of bacteria.

### WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

At a committee meeting, held at the Westbourne Restaurant on October 25, the following gentlemen were elected officers for the ensuing year, viz., President, Mr. Frederick Andrews; Vice-President, Mr. R. H. Parker; Hon. Treasurer, Mr. J. H. Mathews; Hon. Secs., Mr. H. Cracknell and Mr. A. J. Phillips. It was also resolved to hold the annual dinner of the Association at the Holborn Restaurant on November 15, and the President, Hon. Treasurer, and Hon. Secs. were appointed as a committee to carry out the arrangements for the same. It is hoped that chemists who may not be members of the Association will also join on that occasion.

## Provincial Transactions.

### BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the local committee was held at Nottingham on September 26, when the Treasurer reported that the whole of the accounts were paid. He at the same time presented his balance sheet. Messrs. T. Mason and J. Wilford were appointed Auditors, the Hon. Secretary being instructed, after audit, to print the statement of accounts, and forward a copy to each subscriber to the Guarantee Fund.

The receipts from the sale of tickets was £161 1*s*., Guarantee Fund £191 1*s*., giving a total income of £352 2*s*. The expenditure came to £342 0*s*. 4*d*., leaving a balance in Treasurer's hands of £10 1*s*. 8*d*. The local committee will decide upon the disposal of the balance.

### CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

The first of a series of social evenings was held on Thursday, October 26, at St. Edward's Passage, Mr. W. Elborne, B.A., F.C.S., in the chair. A large number of members were present, and a delightful evening was spent. Mr. E. H. Church kindly arranged the programme, which was both vocal and instrumental, other helpers being Messrs. E. S. Peck, Turner, Wing, Plumb, S. H. Pryon, H. Bryan, H. Moore, and F. S. Campkin.

### LEEDS CHEMISTS' ASSOCIATION.

The Annual General Meeting of the above Association was held in the Library on Thursday, October 26, 1893, Mr. R. Reynolds (President) in the chair.

Mr. W. D. Pollitt (Hon. Sec.) read the following annual report: "The Council, in presenting the twenty-fifth annual report, has to record a small increase in membership. Owing to the heavy expenditure of recent years, and the lack of support accorded to the classes, it was decided not to give any course of lectures for the present. Your Council, however, is fully alive to the importance of the subject and hopes, at no distant period, to be able to make arrangements for lectures to be given in such subjects as are not already provided for by other institutions in the city. The maintenance of the Library and Museum in an efficient condition amply justifies the existence of the Association, and deserves a more general support from the members of the trade. It is to be desired that associates should avail themselves to a greater extent of the educational advantages offered by the books and specimens. The past year has furnished new illustrations of the ingenuity of those persons who would get behind the Pharmacy Act of 1868, by attempts to evade the restriction of the sale of poisons to registered chemists who have complied with the educational requirements of that Act. The Pharmaceutical Society, as entrusted with the duty of watching against the infringement of regulations, which have the public safety as their foundation, deserves the continued and increased support of registered chemists in resisting and defeating these insidious endeavours to evade the Act."

The financial statement showed a balance in hand of £2 8*s.* 4*d.*

Votes of thanks were accorded to the Council of the Pharmaceutical Society for the gift of the *Pharmaceutical Journal*, and to the Executive Committee of the British Pharmaceutical Conference for the gift of the 'Year-Book' for 1892.

The officers of the Association were cordially thanked for their services during the past year.

The President brought before the meeting a circular which he had received with regard to the "Federation of Local Pharmaceutical Associations," and, after discussion, it was resolved:—"That this meeting has heard read, and has considered a circular signed by Mr. W. Gowen Cross and others, advocating the formation of a 'Federation of Local Pharmaceutical Associations.' Since the 'better protection of trade interests' is the leading feature of these proposals, in which advantages are anticipated which are not supplied by existing institutions, this meeting considers that the promoters of any new society should show that its objects are feasible, as well as desirable, and, also, should explain how its operations would differ from those of the late Chemists' Defence Association carried on from 1876 to 1887, and then dissolved." Moved by Mr. E. Yewdall, and seconded by Mr. E. Brown.

The following officers and Council were elected for the coming year:—President, Mr. R. Reynolds, F.C.S.; Vice-President, Mr. E. Yewdall, Ph.C.; Hon. Treasurer, Mr. S. Taylor; Hon. Secretary, Mr. W. D. Pollitt. Council:—Messrs. F. W. Branson, F.I.C., G. Briggs, J. Day, Ph.C., P. Jefferson, Ph.C., G. Ward, F.C.S., and G. W. Worfolk. Auditor, Mr. E. Brown, Ph.C.

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At a meeting of this Association, held on Thursday, October 26, the chair was taken by the President, Mr. W. L. Currie, and Mr. James A. Russell brought forward "Some Suggestions for the Better Government of Pharmacy." Mr. Russell took a somewhat pessimistic view of the present-day condition of pharmacy, and argued that the spirit of the Pharmacy Acts aimed at the whole of the practice of pharmacy being in the hands of competent individuals. In reality, however, what was accomplished by the Acts fell far short of this, and they were quite inadequate for their purpose, as witness the dealing in medicines without restriction by so many unqualified persons. Duly qualified pharmacists, too, often abused their position for the sake of mercenary profit, and dignified such abuse under the title of business sharpness. In order to remedy existing conditions, it was suggested that the whole practice of pharmacy should be relegated to persons who were both legally qualified and trustworthy in the performance of their work. Graduates in pharmacy should be expected to sign a declaration, to the effect that they would exercise the several parts of their profession to the best of their knowledge and abilities—for the good safety and welfare of all persons for whose use they might compound or distribute medicines—and that they would not, for any consideration whatever, knowingly do anything to the hurt or prejudice of such persons or to the detriment of pharmacy. A code of ethics should also be drafted by a representative body and approved by pharmacists generally.

In the discussion which followed, Messrs. Moir, McEwen, Boyd, and Robb took part, and the President, in commending Mr. Russell's suggestions, said that if they were carried into effect, pharmacy would be in a better condition. After a brief reply to criticisms by Mr. Russell, a hearty vote of thanks was unanimously accorded him.

Subsequently, a letter was read which dealt with the proposed plan for the federation of local pharmaceutical associations, and left over for further consideration. Mr. Jas. A. Russell was elected Treasurer in place of Mr. Jas. Findlay, and seven new members joined the Association.

# Parliamentary and Law Proceedings.

### REVOCATION OF A PATENT FOR A COUGH MIXTURE
### *Re* SLEIGHT'S PATENT.

In this case Mr. Aston, Q.C., with Mr. Wallace, appeared on behalf of the Pharmaceutical Society of Great Britain, on Saturday, October 28, before Mr. Justice Chitty, in support of a petition for the revocation of letters patent No. 20,377 of 1892, which was described as being for an improvement in cough mixtures.

Mr. Sleight, the patentee, appeared in person, and said he was not financially in a position to oppose the petition, but he wished to make some remarks upon it.

Mr. Justice Chitty said if the petition were opposed it would have to go into the witness list of cases, or be tried in some form on another day. He asked Mr. Sleight if he desired to file any affidavits.

Mr. Sleight said he did not.

Mr. Aston said the grounds on which he asked for revocation were (1) That this was not an invention such as, having regard to public policy, ought to be the subject of letters patent; (2) that the alleged invention upon the face of it, as described, was not subject matter of a patent; (3) that even if it were subject matter, it had been clearly anticipated both by public knowledge and by a special instance of prior use; and (4) that if the patentee said there was something new and special in the way in which he compounded the various ingredients, the specification was insufficient.

Mr. Justice Chitty again suggested to the respondent that he could not contest the case in any way without evidence, and offered to allow the petition to stand over for him to further consider the matter.

Mr. Aston also said his clients did not desire to take any advantage of the respondent, and were quite willing that the matter should stand over for a short time, if his lordship thought right.

Mr. Sleight, however, said he had made up his mind not to oppose the application, and his lordship therefore made the order for the revocation of the letters patent, prefacing it with the statement that the respondent appeared and submitted to the order.

Mr. Aston said he must ask that the order be made with costs.

Mr. Justice Chitty said that must be so.

### PHARMACEUTICAL SOCIETY *v.* DELVE.

In the Queen's Bench Divisional Court, October 21, before Justices Charles and Wright.

Mr. Finlay, Q.C.: My lords, this is an appeal from the County Court of Lancashire, holden at Manchester, and raises a point of considerable importance under the Pharmacy Act, 1868, with regard to the subject of poisons, the 31st and 32nd Vict.

Mr. Justice Charles: What is the section?

Mr. Finlay: It arises under the 15th section of the Act, and I shall have to read several sections, but before doing so I was about to tell your lordships generally what is the point relied on. The defendant, not being a qualified chemist—he keeps a drug store, I believe, but he is not a qualified chemist—was charged with selling this preparation, which he calls licoricine; I have here the bottle which formed what I may call the *corpus delicti*, the bottle which was sold. It is entitled "Licoricine. A wonderfully efficacious household remedy for coughs, colds, asthma, difficulty of breathing, and similar complaints. This preparation combines in a most agreeable form the well-known soothing and healing properties of licorice root and glycerin, with ipecacuanha, marsh mallow, chlorodyne, etc., and to ensure its careful use according to the printed directions, the Pharmacy Act, 1868, requires it to be labelled POISON. It is a valuable medicine for general use, and may be taken at any season of the year when coughs and colds are prevalent. A little when chilled or wet will usually prevent any bad effects. Prepared only by Mandall and Co., Chemists, 133, High Street, Stockton-on-Tees."

Mr. Justice Wright: The defendant's name does not appear upon it at all?

Mr. Finlay: It does not. The active principle in this licoricine is morphine, and the case made for the defendant, as I understand it, is this: that there is no evidence as to the quantity of morphine contained in this licoricine. I will read the sections presently, but our point for the prosecution is this, that the whole object of this legislation was to prevent unqualified persons dealing with such a dangerous drug as morphine or preparations of morphine, and that it is no answer whatever from him to say that there is so little of the morphine in it that it will not do any harm. The whole object of the legislation is to prevent unqualified persons dealing with it. We do not at all admit that there is so little that it will do no harm, but the prosecution has been framed in the way in which it has been framed for the purpose of establishing the principle that an unqualified person is not to deal in these dangerous articles.

Mr. Justice Wright: There is no question of law raised on the appeal, is there? It says the County Court judge was wrong in holding that this article was not a poison. That is not a question of law.

Mr. Finlay: It is not disputed that morphine is a poison; that is a question of law.

Mr. Justice Charles: Well, the County Court judge says, "I myself did not consider that the evidence as to quantity was sufficient to justify judgment for plaintiffs." Is not that a question of fact?

Mr. Finlay: My lord, our point is this, that a preparation of morphine beyond all question is a poison as a matter of law, because that is defined by the order.

Mr. Justice Wright: Not a homœopathic quantity of it?

Mr. Finlay: Test it in this way.

Mr. Justice Charles: How do you make out that this is a matter of law?

Mr. Finlay: Because it is mentioned in the order.

Mr. Justice Wright: Morphine is a poison, you say?

Mr. Finlay: I will read the section in one moment, my lord, but if you will allow me I will put my point in one sentence, first in answer to Mr. Justice Wright. Suppose the defendant were charged with selling morphine by itself, or a preparation of morphine by itself, without liquorice root or anything else in it, it would be no answer on his part whatever for him to say, "The dose I sold was so small that it would not poison anyone."

Mr. Justice Wright: If the judge found that it was not morphine that he sold.

Mr. Finlay: He has found there is morphine in it, but he says there ought to have been evidence to show that the morphine was there in a dangerous amount. My proposition is that the whole object of this legislation is to prevent an unqualified person from selling such drugs, and that it is no answer whatever for him to say, whether he sells the drug alone or diluted with other matters, there is so little of it that it would not do harm.

Mr. Justice Wright: Your proposition of law is that it being found by the judge—we may take it in that way—that there was some morphine, he is bound to find a verdict for the plaintiffs.

Mr. Finlay: Yes, my lord. I will just read the notes, which are extremely short, and then call attention to the sections. "Mulholland admits that preparation of morphine is poison within the Act, sec. 15. Admitted by Mulholland that if defendant was shown to have sold preparation of morphine he has committed offence within Act." Then Foulds proves the purchase of bottle at the drug store. That he asked for bottle of licoricine. Then Mr. Moon proves the handing over the bottle with a stamp over the cork. Then Mr. Eastes, the analyst, says: "March 10, received bottle from last witness. This is bottle. I analysed contents—found morphine—did not estimate actual quantity. Cross-examined: It was not a trace, it was more. Was not instructed to take quantity. It might be that quantity is one-fiftieth of grain per ounce, three-fiftieths of grain in bottle. Not prepared to say whether the taking of whole of the contents of the bottle would do an adult any harm." Then Mr. Mulholland, for defendant, takes the first point on which the learned County Court judge was against him. Then, "This case is distinguishable because it has been proved the amount is infinitesimal."

Mr. Justice Wright: What case is that?

Mr. Finlay: It is the Pharmaceutical Society *v.* Piper, 1 Q. B., 1893, page 690. The point here is touched upon in the judgment in this case, but not decided. I will read to your lordships what is said by the learned judges upon it. The point that was decided there was that the prohibition in the Act against the sale of poisons by other than registered chemists was not confined to the sale of the scheduled poisons in their simple state, or of the preparations of such poisons, but extended to the sale of a compound containing the scheduled poison as one of its ingredients, and that chlorodyne was a poison within the meaning of the Act. And, further, that the exception in section 16 in favour of patent medicines extended only to medicines which were the subject of letters patent and not to proprietary medicines. Mr. Justice Lawrance and Mr. Justice Collins formed the court, and at the bottom of page 692 Mr. Justice Lawrance refers to this point and Mr. Justice Collins afterwards also deals with it. "Of course every case can be so put as to appear ridiculous, and the case has been put to us of a medicine containing an infinitesimal quantity of poison; but it is obvious that, at any rate, no harm would be done by labelling such a medicine 'poison.' There is a point at which any medicine containing poison may become dangerous, and we ought not to fritter away the provisions of an Act of Parliament the object of which is to protect the public and to prevent unqualified persons, who may have no scientific or chemical knowledge whatever, from retailing, dispensing, or compounding poisons.'

Then he deals with the question of proprietary and patent medicines.

Mr. Justice Wright: In the present case there is no exact evidence of the quantity.

Mr. Finlay: There is not, my lord. The way I desire to put the case is this. Suppose the defendant had sold morphine by itself he could not have said: "I am not liable because it is a small dose." The answer is obvious. The very object of the Act is to prevent the dealing in these things at all; you have sold morphine.

Mr. Justice Wright: That is clear enough, but that is not this case.

Mr. Finlay: My lord, if he has sold morphine with various other innocuous and entirely inoperative ingredients in the bottle, he is on the same footing, I submit, as if he had sold the morphine and the other harmless ingredients in the bottle separately. Suppose he had sold a dose of morphine, the morphine which is in this bottle, by itself, and then sold the extract of licoricine, or whatever it is, and told his customer to drop the morphine into the bottle. Then he would have committed an infraction of the Act.

Mr. Justice Wright: Suppose he took a poisonous salt and sold it mixed with an acid which neutralised it, would he, in your view, be liable under the Act?

Mr. Finlay: Then, my lord, that poison would have ceased to exist as a poison.

Mr. Justice Wright: If it is sold in so diluted a condition that it cannot hurt anybody, is that a poison?

Mr. Finlay: Your lordship, I understand, puts the case of something which has been added to it which alters its chemical nature and makes it cease to be a poison.

Mr. Justice Wright: I did; but now I say if there is morphine, but no evidence to show whether there is more than an infinitesimal quantity, do you say that is within the Act?

Mr. Finlay: Here it is more than an infinitesimal quantity, my lord. The evidence is that it was not a trace—it was more.. He was not instructed to take the quantity; it might be the quantity is one-fiftieth of a grain per ounce—three-fiftieths of a grain in the bottle.

Mr. Justice Wright: That is mere calculation; he says it might be.

Mr. Finlay: But, my lord, if I may start from this, if he had sold this quantity of morphine by itself he clearly could not have justified it on the ground that it was so small a dose that it would not do anyone any harm.

Mr. Justice Wright: Clearly not.

Mr. Finlay: My submission to your lordship is that it is just the same thing if he sells it with a certain quantity of water as if he sold it by itself. He has sold this poisonous stuff, and the object of the Act was to prevent him, as an unqualified person, from dealing with such dangerous matters. There is just one other passage in this case where Mr. Justice Collins touches on this question, which I should like to read—it is at page 696.

Mr. Justice Wright: You ought to have taken a little more trouble in this prosecution, ought you not? The parties ought to have got a proper analysis.

Mr. Finlay: My lord, the object of the prosecution in this form is this, to assert the principle that, however small the quantity of poison sold may be, there is a liability under the Act. It was not by oversight, it was intentionally put in this form.

Mr. Justice Charles: I think if my brother, Mr. Justice Collins, had been at Manchester, he would have agreed with the County Court judge. He says in his judgment in this case you have cited, "When that proposition is once established, the question of whether there is more or less——

Mr. Finlay: That is the passage I was about to read.

Mr. Justice Charles: The proposition was that the sale of a compound was included in the mischief. He says, "The question of whether there is more or less of a scheduled poison in the compound is not one that has any logical bearing on the question until we arrive at the principle *de minimis non curat lex*." That is the analogy which Judge Heywood seems to have applied.

Mr. Finlay: With deference I submit that principle does not come into play until it is shown affirmatively that the thing is a mere trace.

Mr. Justice Wright: I do not quite agree as to that.

Mr. Justice Charles: What is the form of the proceeding here?

Mr. Finlay: It is under section 15, my lord, a proceeding in the County Court.

Mr. Justice Wright: Suppose a jury found, if it were tried before a jury, that the proportion present was so small that it could not have any possible effect; that surely does not come within the Act.

Mr. Finlay: The very same question would arise, I submit. Suppose the dose were sold by itself without anything else.

Mr. Justice Wright: No, no.

Mr. Finlay: Suppose a man sold so minute a dose of morphine that it would not have any poisonous effect, that would be no answer, and for this reason, whether by itself or mixed with water or other things, if a sufficient number of them are bought, the poisonous effect is obtained.

Mr. Justice Wright: In the one case it is the action of morphine itself, in the other it has lost its personality by the immensity of something else that it is merged in.

Mr. Finlay: It remains a preparation of morphine. If the case that your lordship put to me of the addition of other chemical ingredients were understood in this sense, that the other ingredients changed the chemical constitution of the poison so that it ceased to be a poison, I should of course concede he did not sell it.

Mr. Justice Charles: What is the legislation which makes this matter a poison within the meaning of section 15?

Mr. Finlay: It is the order, my lord, page 27, of the book I handed up.

Mr. Justice Charles: On what authority is that order made?

Mr. Finlay: Under section 2 of the Act, my lord. I had better refer to the sections—[Reads section 2.]—Schedule A contains certain articles, one of which is opium; opium and all preparations of opium or poppies. That is in the second part of schedule A. Of course morphine is a preparation of opium; it is the active principle of opium, so that it would be covered by that.

Mr. Justice Wright: "Opium and all preparations of opium." Then it must be found, as a fact, that it has substantially enough in it to be called a preparation of opium. It is not because there is a trace of opium that it is therefore a preparation of opium.

Mr. Finlay: That morphine is a preparation of opium I submit does not admit of dispute. It is the active principle of opium.

Mr. Justice Wright: I will assume that; but the mere fact that there is a trace of morphine does not make it a preparation of morphine.

Mr. Finlay: No; if it were shown to be a mere trace; but that is negatived by the evidence.

Mr. Justice Charles: This is a criminal case.

Mr. Finlay: No, my lord; not criminal.

Mr. Justice Charles: Yes; it is punishment. So I read the Statute. The learned judge is bound to have enough evidence to justify him in convicting the respondent.

Mr. Finlay: Solely as to the fact of morphine being there, I submit.

Mr. Justice Charles: I think what the learned judge meant was this. I daresay the language of my brother Collins was cited to him, and evidently he thought that the case was *de minimis*.

Mr. Finlay: That case certainly was referred to.

Mr. Justice Wright: What was it—an action for a penalty?

Mr. Finlay: Yes, my lord, and the language of the 15th section is clear (reads the section). The first section provides that from and after December 31, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume the title of chemist and druggist, and so on, unless he is registered. The second section defines what are poisons. I do not think there are any other sections I need refer to, except the 17th. Those are the material sections. Then schedule A I have called attention to, which, in the second part, contains opium, and all preparations of opium, and poppies, and the additional order made in 1869, which specifies preparations of morphine, and adds preparations of morphine to the list of poisons. My lords, under these circumstances I submit to your lordships that this defendant is shown to have sold morphine itself, and the fact that it is diluted is no more defence than if he had sold the morphine by itself and the diluting elements separately, and that, therefore, the case really resolves itself into a question of law and not of fact, and that the plaintiffs were entitled to judgment.

Mr. Justice Charles: I do not feel myself able to differ from the decision at which the learned County Court judge arrived in this case. The action before him was an action for a penalty, and whether the penalty was recoverable or not, depended on whether the 15th section of the Pharmacy Act of 1868 had been infringed or not. The analyst who was called on the part of the prosecution does not seem to have been instructed to take the quantity of the poisonous article. He expressly says so; that he was not instructed to take the quantity. He says it was not a trace, it was more than a trace, but I was not instructed to take the quantity. Then he goes on to give some very small fractions, which he says might have been the amount of morphine contained in this bottle, which the defendant sold. The learned judge entered judgment for the defendant, and he reports that he did not consider the evidence as to quantity was sufficient to justify judgment for the plaintiff. In other words, he was not satisfied the offence was proved. He was not satisfied there was anything more than such an infinitesimal trace—I will not use the word trace—such an infinitesimal quantity of this article in the bottle as to make it right to convict a person who sold the bottle of an offence under section 15. I cannot differ from him, on this evidence.

Mr. Justice Wright: I am of the same opinion. It seems to me an abuse of language to say that if you put a grain of strychnine into a hogshead of beer that is a preparation of strychnine.

Mr. Finlay: Would your lordships give us leave to appeal? I do not know that we should carry it further, but it was raised in this form intentionally for the purpose of settling the question.

Mr. Justice Charles: There is no imprisonment or fine follows the decision—only a forfeiture; you do not want leave.

Mr. Finlay: Yes, my lord; it is from an inferior court. Of course, we shall consider the matter, but it was raised in this form because it is an important question.

Mr. Justice Charles: We do not see our way to give leave to appeal on this case.

Mr. Justice Wright: I should be sorry that a question of so much importance as you really wish to determine should be raised on such very insufficient materials.

Mr. Justice Charles: The learned judge really seems to have thought that the evidence of the prosecution did not justify him in fixing the defendant with a penalty. You had better take another case.

Mr. Justice Wright: And instruct your analyst to be more definite. It depends on how much there is, whether it is poisonous.

### POISONING BY OXALIC ACID.

On Monday last, Dr. George Danford Thomas held an inquest at Islington relative to the death of James Middleditch, aged fifty-seven years, lately living at 88, City Garden Road, Islington, who committed suicide by poisoning himself on the previous Friday night.

Ann Middleditch, the widow, stated that the deceased, who was a porter at the Smithfield Meat Market, had been much given to drinking habits. On Friday morning deceased took a packet from out of his pocket, which she thought was Epsom salts, and put the contents in the cup, after which he drank it off. She sent her son for a doctor, but deceased died before one arrived. She afterwards learnt that deceased had drank, instead of Epsom salts, a quantity of oxalic acid.

The jury returned a verdict of suicide whilst of unsound mind.—*Evening News and Post.*

## Obituary.

Notice has been received of the death of the following:—

On the 30th of September, John Bell, Chemist and Druggist, formerly of Scotch Street, Carlisle, but for the past thirty years assistant to Mr. Andrew Thompson, Pharmaceutical Chemist, Carlisle.

## NOTICES OF MEETINGS NEXT WEEK.

### MONDAY, NOVEMBER 6.

*Society of Chemical Industry*, at 8 p.m.
"Spirit Assaying by Weight," by J. Scarisbrick.
"Estimation of Alizarin and Allied Colouring Matters," by P. W. Dreaper.

### TUESDAY, NOVEMBER 7.

*Liverpool Pharmaceutical Students' Society*, at 8.15 p.m.
Social and Smoking Concert at the Falcon Restaurant.

### WEDNESDAY, NOVEMBER 8.

*Pharmaceutical Society of Great Britain*, at 8 p.m.
"Note on Manna Collection in Sicily," by J. S. Ward.
"Certain Spurious Drugs Recently Imported," by Professor Greenish.
*Sheffield Pharmaceutical and Chemical Society*, at 8.30 p.m.
"Pharmaceutical Microscopy," by J. Austen.
*Edinburgh Chemists' Assistants' Association*, at 9.15 p.m.
Inaugural Address by the President.

### THURSDAY, NOVEMBER 9.

*Chemists' Assistants' Association*, at 8.30 p.m.
"Laboratory Notes," by A. Gunn.
*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
"Pharmaceutical Ethics," by R. Tocher.
*Cambridge Pharmaceutical Association.*
"Scientific Methods; with especial reference to those of Pharmaceutical interest," by M. M. Pattison Muir.

### SATURDAY, NOVEMBER 11.

*Pharmaceutical Football Club* v. Willesden, at Willesden, at 3.15 p.m.
Reserves *v.* Holly Club, at Shepherd's Bush.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bessant, Cripps, Dott, Hill, W. M. Holmes, Nagelvoort, Proctor, Thompson, Thursfield.

## NOTE ON MANNA COLLECTION IN SICILY.*

BY J. SLINGER WARD.

Before leaving London towards the end of March last for a short holiday visit to Sicily, Professor Greenish suggested to me that some information might be obtained there on the cultivation of the manna ash and the production of manna. By the kind offices of Signor Hamnett, of Palermo, I am able to give the results of the investigation.

The plantation visited is situated at Villa Grazia, a village on a pleasant slope near the foot of Monte Grifone, about six miles to the south of Palermo. It occupies nearly two acres, the trees planted without regard to regularity, but closely enough to form sufficient shade. The manna ash under cultivation has the appearance of a pollard willow, the parent stem being scarcely above the ground. At the time of my visit the trees were in flower, and proved to be the *Fraxinus rotundifolia*. The proprietor informed me that the stems when ten years old are ready to yield manna. One incision covering one-third of the circumference of the stem is made daily, cutting through the bark from the right to the left transversely, commencing at the base of the stem, the right extremity of the cut is slightly higher up the tree than the left. The season, which is ruled by the weather, usually commences in July and ends in September; during the collection about forty-five incisions are made. By the incisions following each other with regularity, like the steps in a ladder, the exudation runs and hardens in a channel, thus the familiar strip of manna is produced; this in that particular locality is termed "Manna Cannolo." The system of inserting straws or sticks into the incision is not adopted there. In wet seasons, when the exudation is very fluid, a cactus leaf is placed on the ground to receive it as it drips; this and the small and broken pieces are known as "Manna Rottame." The following year fresh incisions are made adjoining the previous season's, each of which occupies one-third of the circumference; the third year the unincised portion of the bark is cut, and the period for yielding manna is at an end. The stems are then cut down near the root; new stems spring up. When sufficiently mature the collection commences. Each root has attached both stems yielding manna and younger ones to replace those exhausted. The average number of stems in use in each tree was four. Each stem yields about half a kilo. of manna in a good season.

It will be noticed that the description given in the 'Pharmacographia' is almost identical with the present practice of collection near Palermo.

On leaving the plantation I was able to secure from a house in the neighbourhood an exhausted stem, which bears evidence of being used for some domestic purpose; this I brought with me, and is now on the table. From its size it is somewhat unique, and illustrates very clearly the manner in which the incisions are made; each season's marks may be easily distinguished. At the same time it will be readily understood how the exudation owing down the stem in a viscid stream from the successive incisions concretes into the manna of commerce. This may be taken as a fair specimen of the thickness of the productive stem.

A "snap-shot" at a tree was taken by Mr. White, who accompanied me; this he has kindly transferred to a lantern slide I have to show you, which will give a still further illustration of the kind of tree and its surroundings.

[*The discussion on this paper is printed on p.* 391.]

## CERTAIN SPURIOUS DRUGS RECENTLY IMPORTED.*

BY HENRY G. GREENISH,

*Professor of Materia Medica to the Pharmaceutical Society of Great Britain.*

It is well known that from time to time drugs find their way into the London market which are not what they are represented to be, the misrepresentation being frequently, if not usually, the result of carelessness or ignorance rather than of intentional fraud. Some of these "false drugs," as they are commonly termed, receive a brief notice in the *Pharmaceutical Journal*, under the head of "The Month;" others escape such notice altogether, and few are brought prominently before the members of the Society, although to them of all people an intimate acquaintance with such drugs should be of particular importance. It is my desire therefore, to-night, to bring before you certain of these, and deal with them somewhat more fully than would otherwise be the case. I have been brought into contact with them partly by more or less regular visits to the periodical exhibits of samples by the drug brokers, partly by the kindness of friends, to whom I take this opportunity of expressing my thanks.

### SENNA.

First let me direct your attention to the specimen of supposed "senna," which was presented to the Museum a few weeks ago by Dr. Paul, who informs me that it was sent from Tunis. It is said to consist of the leaves of *Pistacia lentiscus*, the mastich tree, a plant belonging to the natural order Anacardiaceæ. From our Curator, Mr. Holmes, I received a few of the leaves and also one of *P. lentiscus* from the Herbarium for comparison.

The "senna," it will be observed, consists of the leaflets of an imparipinnate compound leaf; the petioles are slightly but distinctly winged; the lamina is dotted with oil glands and emarginate at the apex. By these characters they certainly differ from the leaves of the various species of *Cassia*.

The transverse section of the midrib taken at about one-third of the length of the leaf from the base exhibits a crescent-shaped principal fibrovascular bundle with the bast towards the under surface, supplemented by a smaller bundle with the bast directed towards the upper surface of the leaf. In the mesophyll there is one row of palissade cells and an occasional lysigenous oil-gland.

The mastich leaf, on the other hand, shows a midrib somewhat similar in general structure, but distinguished at once by the presence in the soft bast of the principal fibrovascular bundle, and therefore towards the under surface of several, in this instance three, oleo-resin ducts. The secondary nerves contain usually one duct only. These ducts are of schizogenous origin; they are lined with a tapetal layer of secreting cells and contain drops of oleo-resin. The mesophyll contains two rows of palissade cells not unfrequently filled with small crystals of oxalate of calcium, which also occurs frequently in the bast as single crystals and in the mesophyll as agglomerations. Oil cells or glands other than the ducts mentioned are not present. The typical feature here, and one which is characteristic of the natural order Anacardiaceæ, is the presence of schizogenous ducts in the soft bast only. The absence of such ducts from the so-called senna leaves is sufficient evidence that they are not the leaves of *P. lentiscus*. Other distinctive characters are to be found in the epidermal cells of both surfaces, and especially in the stomata on the under surface. These in *Pistachia* are surrounded by seven to ten cells, whilst in the senna they are bordered by four or five, arranged in quite a different manner.

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* Read before the Pharmaceutical Society of Great ritain at an Evening Meeting in London, November 8.

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The anatomical structure, as I have demonstrated, shews that in assigning this leaf to Anacardiaceæ we are on the wrong path. It will be interesting to ascertain whether the structure is capable of pointing to the right path. As a matter of fact the lysigenous oil glands will at once recall the order Rutaceæ, an order which frequently shows a midrib of similar structure, stomata similarly arranged, and a like absence of hairs. Assuming Rutaceæ to be the natural order, the compound leaves would direct us to the tribe Xanthoxyleæ, and the winged petiole to the genus *Xanthoxylum*, a genus very closely allied to *Pilocarpus*. Mr. Baker, of the British Museum, kindly assisted me in examining several species of *Xanthoxylum*, one of which closely resembled, but was not identical with the leaves in question, and I feel convinced that the plant yielding these leaves is either a *Xanthoxylum* or very closely allied to it; but not until flower or fruit be forthcoming can the botanical source be definitely ascertained.

### MATICO.

A short time ago I observed a sample of matico exhibited for sale, which attracted my attention not so much from any inherent peculiarity as from the fact that I had seen few maticos on sale. Examining it more closely I picked out a couple of tolerably well preserved leaves which aroused my suspicion by their broadly ovate shape and large size, the broken leaf closely resembling ordinary matico. This recalled to my memory a large-leaved matico which Mr. Ward had shown me some months ago, and I had examined and considered genuine. I have now examined both of these microscopically, and compared them with genuine matico, with the following results:—

The hairs, which are more or less characteristic of matico, and to which I looked for distinctive features, are so similar in all three specimens that I sought for other peculiarities; although it is true in the broad-leaved matico, those on the nerves are generally stouter. Now in the transverse section of genuine matico it will be observed that the epidermis consists of one layer of tabular cells, and that immediately beneath it is a single layer of colourless hypodermis; there are two rows of palissade cells in the mesophyll, and numerous cells filled with yellowish oil. Near the base the midrib contains a number of fibrovascular bundles separated by colourless parenchyma. The large-leaved matico of Mr. Ward shows on examination a very similar structure. The epidermis is one-celled; the hypodermis is present, but the oil-glands are perhaps not so numerous. I think this is a genuine matico, and the examination of the epidermis of both surfaces confirms that view; the two leaves agree well.

The broadly ovate leaves show a very different section. Here the epidermis of the upper surface consists of one layer of large square cells; there is no hypodermis present, and the oil cells in the mesophyll are very numerous. The epidermis of both surfaces, when separated from the leaf, are seen to consist of cells much larger than those of the two previous leaves. These broadly ovate leaves are unquestionably those of a Piper, and one nearly allied to matico, but they are not the leaves of *Piper angustifolium*. Their substitution is not a matter for much surprise, as the term matico appears to be applied indiscriminately in South America to a number of piperaceous leaves. Mr. Holmes has been kind enough to examine the Piperaceæ in the National Herbaria, but informs me he has not been able to satisfactorily identify the specimen.

An interesting feature in the anatomy of these leaves is the presence of numerous thick-walled, porous parenchymatous cells surrounding the bast of the midrib, and in their immediate neighbourhood very numerous thin-walled cells containing a number of acicular crystals of oxalate of calcium lying loosely in them. These cells can easily be isolated intact, frequently in rows. This quantity of oxalate of calcium doubtlessly causes the grating on the teeth which is perceptible when the leaves are chewed. Further, if the mesophyll be carefully examined, each parenchymatous cell will be seen to contain, in the true matico, two or three minute crystals of oxalate; in the broad leaves the number of these crystals is larger, perhaps five or ten, whilst in the leaves of another piperaceous plant each cell contains a large tuft of them, and the effect is as striking to the eye when the section is examined as it appears to be to the edge of the razor when cutting. The presence of oxalate of calcium in this form in the lamina of the leaf can scarcely have escaped observation, but I find no mention of it in the anatomical descriptions at hand, not even by that careful observer, Lemaire, and I cannot but consider it very unusual.

### JALAP.

Some months ago samples of jalap were exhibited which could scarcely be mistaken for the true drug, but of which I was glad to secure a sample for the educational collection of drugs at present in my charge.

On examining it, I was surprised to find that my sample of five pieces contained no less than three distinct roots. True jalap, I need scarcely say, is characterised by its cells filled with granular latex, and arranged in more or less regular concentric rings; by its starch-grains, which, however, are frequently gelatinised; by the fibrovascular bundles, which consist usually of little more than a few vessels with soft bast; and by the oxalate of calcium in agglomerated crystals.

This tapering root contains no secretion-cells, and is therefore probably not a convolvulaceous root; it is interesting from the extraordinary number of cells completely filled with raphides distributed throughout the parenchymatous tissue. These can easily be seen with the naked eye on a radial fracture.

The second root, which we may call A, contains in the cortical portion a number of cells filled with a clear yellowish resin and oxalate of calcium in agglomerated crystals. Milk-cells as they occur in jalap are absent; the starch grains are seen to be of large size and characteristic shape. It is certainly not true jalap, nor is it the root of *Ipomœa orizabensis.*

The third root, which I have called B, contains milk-cells in abundance, oxalate of calcium in agglomerated crystals. The xylem portion of the fibrovascular bundles is well developed and the starch grains small and mostly compound. This approaches more closely to the male or light jalap of *Ipomœa orizabensis*; the starch grains, however, are much smaller. This example may serve to show the variety one may find in a single parcel.

### SARSAPARILLA.

A curious and interesting drug is one of which four bales were recently shipped from New York and offered as sarsaparilla. The pieces of which it is composed average perhaps about three feet in length, are very dark-brown in colour, irregularly furrowed, usually flattened, and show here and there a rootlet as well as the remains of aerial stems. The cortical portion easily separates, and the central column then readily splits into flattened plates.

Under a low power the transverse section shows an external brown layer, consisting of several rows of brown or yellow slightly thickened parenchymatous cells, enclosing a ground tissue loaded with starch, in which are embedded two plates of brown prosenchymatous fibres. Between these plates are situated the two principal fibrovascular bundles; arranged in a circle nearer the periphery are a varying number of smaller bundles.

Each bundle consists mainly of an internal mass of vessels and wood parenchyma, the xylem, completely surrounded by a narrow ring of bast, containing sieve-tubes and cambiform cells. This is followed by a row of parenchymatous cells with starch, and the whole is enclosed by an endodermis. On separating the tissue into its component cells, the vessels are seen to be scalariform and the sieve-tubes acutely pointed.

This construction indicates clearly that the drug is the rhizome of a fern, probably polypodiaceous, and possibly a *Pteris;* and this small piece of the rhizome, for which I have to thank Mr. Jackson, of Kew, is not at all unlike our drug. On the other hand, Mr. Baker suggests an *Acrostichum*, a climbng fern common in tropical America, and attaining length of thirty to forty feet, whilst *Pteris* is said y Martius to range from one to four feet in ength.

The structure of the rhizome of *Pteris aquilina*, our common brake fern, agrees well with that opposition, the protophloem entirely surrounding the xylem, as figured by Professor Russow in his 'Comparative Anatomy.'

Under the name of *Polypodium calaguala*, Goebel and Kunze describe and figure a fern rhizome which appears to have borne a high reputation in Peru, and which was brought to Europe by the Spaniards at least as early as the 18th century. The description of Goebel and Kunze applies to the rhizome in question, but the plate shows some difference. Probably, however, we are dealing with a similar drug.

### IPECACUANHA.

Much so-called "black" or "striated" ipecacuanha has lately been seen in the market, but appears to be difficult of sale. I had considered this root to be that of *Psychotria emetica*, as it agrees completely with Goebel and Kunze's illustration and description, and fairly with two specimens of greater and lesser striated ipecacuanha of the Pereira collection, which are referred to *P. emetica.* Mr. Holmes, however, observed that the wood is distinctly porous, whereas in another specimen of *Psychotria* in our museum it was dense. I have therefore submitted this root to microscopic examination, and find that it approaches nearer in its histological characters to *Richardsonia* than to *Psychotria. Psychotria* and *Cephaëlis* are so closely allied botanically that we should expect their anatomical structure to be similar. Two species of *Psychotria*, unfortunately neither of them *P. emetica*, show such a similarity in the structure of the wood, and so does the specimen of *Psychotria emetica* in our museum. Probably, therefore, this latter is correctly named, whilst Pereira's two specimens and this "black" ipecacuanha have been incorrectly referred to *Psychotria.* Of the chemical constituents of this root we have as yet no reliable information.

[*The discussion on this paper is printed on page* 391].

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## PHAGOCYTOSIS.*

BY HAROLD C. ERNST, M.D.

(*Concluded from page* 326.)

This work of Christmas-Durckinck-Holmfeld is a fair example of the arguments brought forward by the opponents of the theory that phagocytosis plays any important part in the production of immunity, even if it is somewhat old; and it is of interest to see in wha way Metschnikoff meets the objections, which he does in a paper written shortly afterwards.† He says here that his critic is wrong in the assertion that there were few results obtained by experiments upon warm-blooded animals, as can be easily seen by a reference to his article "Ueber den Kampf der Zellen gegen Erysipelkokken,"‡ with which his opponent is not familiar, and further in the article upon "die Abschwachung der Milzbrand-bacillen im Blute immuner Schafe,"§ in which he (Metschnikoff) uses the occurrence of phagocytosis as a prognostic sign; when many cells containing bacilli are found, the animal may be considered likely to live, when few are present (or none) death is likely to occur. He says also that he has worked so often with rabbits, and has got such positive results, that he cannot accept those of his critic, and suggests that perhaps these latter were due to the technique employed, which is not fully described. He says that fresh preparations must be used, to which have been added some old vesuvin solution, or distilled water, as suggested by Koch.* If this be done, there will be invariably found, in animals immune either by nature or artificially, many phagocytes containing bacilli. Metschnikoff says further, that he has many times used rats for experiment, and always with the same results as above (except that the distinction is not so sharp), and that he has also used preparations (dried only, however) from his own blood, for the study of the struggle between the leucocytes and bacteria. He says that the observations of the behaviour of bacteria in pus contained in capillary tubes are not trustworthy,† even if the tubes be kept at 37° C., for they are not under natural conditions; and it is also the fact that the bacteria observed by him under these conditions produced no spores, even after three days.

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* Read before the Boston Society for Medical Improvement, April 10, 1893. Reprinted from the *Boston Medical and Surgical Journal.*

† 'Fort. der Med.,' Bd. V., 1887, s. 541.

‡ 'Virch. Arch.,' Bd. 107.

§ 'Ann. de l'Inst. Past.,' T. i., 1887, No. 1.

From what we know of Metschnikoff's work, it is but natural to suppose that he does not agree with the objection to the experiments upon cold-blooded animals, on the ground that the results cannot be applied by analogy to warm-blooded animals; for it is just this point upon which he is most insistent. Neither does he agree with the theoretical objections and explanations that the bacteria are destroyed by the absence of oxygen, which fall to the ground since the particular bacteria under consideration are facultatively anaërobic. He goes on to say that he has never, as is asserted, defined phagocytosis as "a power of the leucocytes of certain animals to eat the invading bacteria (and so destroy them)," any more than he has ever asserted that "every organism is immune to such parasitic diseases, the parasites of which the phagocytes of such organism can destroy"—anybody who will take the trouble to read his assertions will see that this is not so. The assertion that "most suppurative bacteria are never enclosed by the leucocytes" is not true, as is shown by many observers; and, in point of fact, the enclosing of bacteria by the leucocytes was first demonstrated in the suppurative bacteria. When the assertion is made that the fluid of pus itself can destroy bacteria by depriving them of oxygen, how is the retention of its vitality and pathogenic properties by the bacillus of tuberculosis explained, an organism that is extremely aërobic, and requires so much oxygen for its continued vitality? He closes by saying that while he certainly has difficulty in explaining certain diseases by means of phagocytosis—such as erysipelas, relapsing fever, as well as mouse-septicæmia and tuberculosis—very certainly he finds nothing in anything of them diametrically opposed to the theory. He has had the greatest difficulty with chicken-cholera; but in his later work he seems to have surmounted much of it.

Baumgarten's opposition has probably done as much as that of any individual to destroy the influence of Metschnikoff's work. Giving the results of experiments in his own laboratory,* he says that they are in wide opposition to the claims of Metschnikoff upon the importance of the leucocytes in producing immunity against, or the healing of bacterial processes. If anthrax spores or bacilli be injected into the dorsal lymph-sac, some of the elements are, after a time, taken up by the leucocytes; but, the degeneration and disappearance of the bacilli occur first among those in the lymph-fluid, later in those contained in the cells. On the contrary, in frogs kept at 25°–30° C., an increase of the englobed bacilli may be found, but the frogs die with a great increase of the bacilli in the blood and organs (as of course would be the case if the phagocytic action had not been sufficient to arrest their development). In pigeons immune to anthrax (and not all of them are so immune) the injected bacilli have disappeared, at the latest, in twelve hours, without the slightest perceptible entrance of any of them into the cells (several of the lantern slides will show that this is not so), and even without the slightest microscopic appearance of suppuration; observation of the disappearance of bacilli in distilled water shows that it occurs in the same way, as Baumgarten thinks, by the absence of nutrient material. The process of healing of the cornea after staphylococcus infection seems to show that the leucocytes die before the cocci (?), so that they can have nothing to do with the destruction of the cocci.

Again† he criticises Metschnikoff's work very severely, saying that it can be concluded, from his own (Metschnikoff's) observations, that phagocytosis was not the healing agent; that in rothlauf, healing occurs without any phagocytic action; that warmed frogs would die any way, without the injection of anthrax bacilli; that in cold frogs there is never a complete attack of the bacilli by the leucocytes, and that these cannot therefore be the curative agent (?); that the same thing is to be said in regard to recurrent fever in apes. His criticism is ironical; and he concludes by saying that the results of his own and his assistant's work are diametrically opposed to those of Metschnikoff.

Metschnikoff‡ reviews the work of Fahrenholz§ and Czaplewski‖ with especial care, because they form the basis of Baumgarten's criticisms upon phagocytosis. Fahrenholz's conclusions (working with the spores of anthrax) are exactly the opposite of those of Metschnikoff; and the latter in turn shows that the experiments of Fahrenholz of keeping frogs at a temperature of 25°–27° C. were exceedingly crude and unsuccessful, and cannot be taken as evidence. Not only was the temperature faulty, but the spores themselves were of poor quality (p. 37), he having used those that were six years old. Metschnikoff remarks that the wonder was that any results in keeping with his own were obtained with such material; and then says, that if the experiments had been made in accordance with proper regulations, the results would doubtless have been the same as those of Lubarsch,[*] which are in complete accord. Czaplewski rejects phagocytosis, and the "chemical" theory as well, as explaining the immunity of pigeons against anthrax, and frankly confesses that he does not know how it occurs. Whereupon Metschnikoff refers him to Hess[†] and Nuttall[‡] on the one hand, and on the other declares that the immunity of pigeons, in this affection, is one of the very best examples of macrophagocytosis; these macrophagocytes being the large mononuclear cells, easily staining with the aniline colours, and occurring so abundantly that Czaplewski must have seen them, but failed to recognise them—probably meaning them by the term "little masses in which the bacilli are crowded together," the occurrence of which he notes as common. They were probably poorly stained; for which reason Czaplewski did not recognise the nucleus.

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* 'Virch. Arch.,' Bd. 97.

† See 'Ann. de l'Inst. Past.,' July, 1887.

* Cent. f. klin. Med., 1888, N. 29.

† Zeit. f. klin. Med., xv., s. 1.

‡ 'Ann. de l'Inst. Past.,' T. iv., p. 34, 1890.

§ 'Inaug. Diss.,' Konigsberg, 1890.

‖ 'Inaug. Diss.,' Konigsberg, 1889.

Baumgarten makes himself responsible for these two articles,[§] and in the same place from which we have been extracting, Metschnikoff shows that Baumgarten makes statements differing from the original ones of Fahrenholz.

To take another instance: Finger[‖] concludes, from the varying behaviour of glanders bacilli in susceptible, immune, and immunised animals—their growth in the tissue fluids, their death in other situations, the appearance of leucocytes in immunised and susceptible animals, and their complete absence in immune animals—that we have to do with a complicated process, and that, not only the leucocytes, but the tissue fluid itself has a great part to play in these processes; facts with which Metschnikoff's theory cannot well be brought into harmony. Which would be very true if that theory claimed all that the critic ascribes to it; but Metschnikoff[¶] says that "among the biological causes [of immunity] are to be mentioned cellular action in general, and especially the microbicidal action of the phagocytes . . . the most difficult point in the study being to separate the different agents that can assist in producing immunity," showing distinctly that he does not ascribe it all to phagocytosis.

Bitter[**] gives a long review of all the work done up to that date upon phagocytosis, including Hess,[††] Ribbet,[‡‡] Lubarsch,[§§] and Pawlowsky,[‖‖] in favour of Metschnikoff's arguments; and Baumgarten,[¶¶] Weigert,[***] Christmas-Durckinck-Holmfeld,[*] and Emmerich[†] against his conclusions. Upon the basis of this review and the work of Nuttall[‡] he concludes as follows: Nowhere do we find in Metschnikoff's work, or in that of his supporters, absolute proof that phagocytes take up and destroy vigorous disease-producers that are dangerous to the body. Against this conclusion are the new observations upon the intensive degeneration of virulent bacilli in the body-fluids without the help of the cells; the late taking up of the injected bacilli by the cells; the greater taking up, and with increased readiness, of the injected cultures in complex cases; and, finally, the appearance and activity of the phagocytes, especially at such a time and in such a condition of the body, that the attack of the infectious element and the pressing need of the body is over; further, he considers that the phagocytes employ their "eating" power only against bacteria that have lost some of their vital energy. He does not deny that phagocytosis may occur in accordance with the hypothesis of Metschnikoff, but he does not consider that its general applicability (validity) is established. If it is desired to prove this, it must be demonstrated, without doubt, that phagocytosis occurs at once upon the entrance of living and fully virulent bacilli, and that an effective destruction of them does not occur without the intervention of the cells. That phagocytosis does occur as soon as it may be reasonably supposed that the cells can exercise their function may be seen in some of the slides to be shown; but neither Metschnikoff or any one else would attempt to claim that this is all that is necessary for the resistance of the organism to an attack in all cases.

Wolfheim,[§] experimenting with the staphylococcus aureus, and producing keratitis with it in the rabbit, found many more cocci between than in the cells, and that, after from two to six days, the phagocytes showed more or less signs of degeneration. Therefore, the phagocytes can in no way act alone as the destroyers of the bacteria.

Buchner[‖] seeks to oppose phagocytosis by asserting that the leucocytes are attracted solely by substances extracted from the bodies of bacteria, and that, as a consequence, the bacteria must have been already destroyed by the bactericidal properties of the body-fluids before the leucocytes proceed towards the invaded region. Such a supposition is opposed by these facts: (1) leucocytosis in infectious diseases is observed from the beginning, that is to say, when the bacteria are living; (2) the increase of the leucocytosis is seen to occur along with the rise of temperature, and ceases exactly at the "crisis," just when a large number of bacteria perish; (3) leucocytosis is seen in cases in which bacteria are living in the blood, as in the anthrax of susceptible animals and in the recurrent fever of man; (4) the leucocytes, as Buchner himself acknowledges, englobe living bacteria—when the bodies of the bacteria are very numerous, but associated with toxic products, the leucocytes, instead of being attracted, are repelled by these toxines.

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[*] 'Cent. f. Bakt.,' Bd. v., No. 19.

[†] 'Virch. Arch.,' 1887, Bd. cix., s. 379, 380.

[‡] Zeit. f. Hyg., Bd. iv., s. 378, exp. 12.

[§] Zeigler's 'Beitrage zur Path. Anat.,' Bd. vii.

[‖] "On Immunity and Phagocytosis in Glanders," Zeigler's 'Beitrage zur Path. Anat.,' Bd. vi., Heft iv.

[¶] "Etudes sur l'Immunité," 'Ann. de l'Inst. Past.,' 1889, p. 289.

[**] Zeit. f. Hyg., 1888, Bd. iv., s. 318.

[††] Unt. zur Phagocytenlehre, Virch. Arch., Bd. cix., s. 365, and Bd. cx., s. 313.

[‡‡] *Deut. Med. Woch.*, 1884; and Der Unt. path. Schimmelpilze im Korper, Bonn, 1887.

[§§] Ueber Abschwachung der Milzbrand-bacillen im Frosch-Korper, Fort. der Med., 1888, Bd. vi., s. 4.

[‖‖] Die Heilung des Milzbrands durch Bact. u. s. w., Virch. Arch., Bd. cvii., s. 494.

[¶¶] Path. Mykol., Bd. i., s. 105.

[***] Fort. der Med., Bd. vi., No. 3.

[*] *Loc. cit.*

[†] Die Heilung des Milzbrands, Arch. f. Hyg., Bd. vi., 4.

[‡] Zeit. f. Hyg., Bd. iv., s. 353.

[§] Beit. z. Path. Anat. Zeigler, Bd. iii., 1888, s. 408.

[‖] *Munc. Med. Woch.*, 1891, Nos. 32, 33; and Trans. Int. Med. Cong., 1891.

Emmerich[*] goes much further than Behring, asserting that phagocytosis has nothing to do with immunity. Metschnikoff shows that his experiments were fallacious, when he asserted that the bacteria of "Rouget" were completely destroyed in twenty-five minutes, a time too short for phagocytosis to occur, for Metschnikoff could not, and Emmerich has not since been able to show the complete destruction of the bacilli in less time than a number of hours, which is plenty of time for the leucocytes to arrive at the threatened point and to exercise their phagocytic property.

Among the mass of papers that have been written upon the subject it is a relief to find the following conclusions by Lubarsch:[†] (1) It appears as yet to be impossible to give a general explanation of immunity, even for a single bacterial disease; (2) for certain cases, it appears extremely probable that immunity is produced by a reciprocal action between the cells and the bacteria, which, as I suppose in opposition to Metschnikoff, has its results outside of the cells; (3) a bacterial-destroying property of the circulating blood independent of the body cells is, as yet, unproven.

Ruffer[‡] has made a series of investigations "On the Phagocytes of the Alimentary Canal," and formulates his conclusions as follows: first remarking that it is interesting to note that the phagocytic phenomena seen in the intestines occur most commonly in, and in the neighbourhood of, Peyer's patches, the seat of so many of the diseases occurring in them; (1) migratory cells possess the power of passing to the surface (of the intestine); (2) there are two sorts of these cells, the micro and the macro phagocytes; (3) the latter produce also microphagocytes; (4) the macrophagocytes possess the power of destroying microphagocytes; (5) both destroy bacteria; (6) in the normal mucous membrane, the bacteria never occur free between the cells in the lymph or blood channels; (7) the destruction of the bacteria constantly going on in the lymphatic tissue of the intestines has the greatest similarity to the destruction of pathogenic bacteria in resisting animals.

Metschnikoff[§] has shown the very interesting fact that phagocytic intracellular digestion goes on in certain cases in an acid medium, although, in other instances in the same experiment, no reaction makes itself apparent. In some of the macrophagocytes seen in his experiments, there was to be seen, near a red granule of litmus, a vacuole containing blue granules of the same substance, showing that the production of the acid intracellular material may be limited to one special portion of the cell.

Time might be taken up almost indefinitely by reviewing articles for and against the assertions of Metschnikoff, but this would be useless. Perhaps the best method for bringing this part of the discussion to a close will be to quote from his book upon "Inflammation," his answer to one of the most prominent objections to his theory. He says (p. 230, *et seq*):

"But, they say—and this objection has been made many times—if phagocytic reaction is developed in order to protect the organism against danger, how is it, that just when the organism is the most menaced, the phagocytes refuse to carry out their part? Here, also, the objection comes from an incomplete knowledge of the principles of the theory. Just because the defence by the phagocytes is developed in accordance with the law of natural selection, and not following out a predestined purpose, it is perfectly natural that cases should occur in which the phagocytes do not accomplish their function, which threatens great danger and death to the organism. In nature there are found varying characters, sometimes useful, sometimes hurtful to the organism. The first produce survival, the second death. If, for example, we consider two organisms—the one, the phagocytes of which are easily repelled by the bacterium; and the other, whose phagocytes manifest a positive sensibility, bringing on an abundant phagocytosis—the first will easily become the prey of the parasite, will be eliminated by natural selection; whilst the second will resist the infection, will survive, and will produce successors endowed with the same phagocytic powers. It is evident that in such conditions, the activity of the phagocytes will augment, supported by selection.

"But the curative force of nature, of which inflammatory reaction is the most important element, has not yet reached a perfect adaptation. The frequency of disease and of premature death proves this quite sufficiently. The phagocytic property has not yet reached its last stage of development, and is still undergoing perfection. Often the phagocytes retreat from the enemy or destroy the elements of the organism of which they form a part (as in the scleroses). It is this imperfection that has for so long rendered necessary the intervention of man—not satisfied with the action of his natural curative force. . . . But if on the one hand medical science has so much that should rest upon biology, of which it constitutes but a part, this service should not be gratuitous.

"General biology itself can gain great advantages by including morbid phenomena in its studies. Often biology finds difficulties in its study of the processes of evolution, because these phenomena are presented under a completed form. So that, for the close analysis of natural selection, the two well-balanced phenomena occurring in nature do not furnish favourable material. To shed light upon this general law, less stable phenomena must be studied—in short the actions less completed, in which the action of natural selection can be observed from day to day. Such are precisely to be found in morbid phenomena with the reactions which they excite—the struggle between the organism and its aggressors, which gives the best opportunity for a consecutive study of the progress of natural selection. In this struggle there always occur survivals, the result of selection, and deaths, occurring for the same reason. On the one hand there are the victorious organisms selected and the parasites destroyed; on the other, the vanquished organisms are eliminated and the conquering parasites selected."

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[*] *Munc. Med. Woch.*, 1891, s. 554.

[†] "Ueber die Ursachen der Immunitat.," Fort. der Med., Bd. viii., No. 17, 1890.

[‡] *Quart. Journ. Mic. Science*, p. 484, 1890.

[§] "Recherches sur la Digestion Intracellulaire," 'Ann. de l'Inst. Past.,' T. iii., 1889, p. 25.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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## THE PHARMACEUTICAL SOCIETY v. DELVE.

THE failure of the appeal in this case, reported in last week's Journal, page 378, cannot be regarded as deciding the question raised in connection with the Pharmacy Act. It may, indeed, be more correctly considered that the question was not gone into. The learned judges of the Appeal Court appear to have held that evidence of the quantity in which a poison, within the meaning of the Act, is present, in a medicinal preparation, is essentially necessary for proving that the poison is there. It was upon that ground they concurred with the decision of the Manchester County Court judge. In both instances it appears to have been thought that the question before the Court was whether a certain quantity of the preparation known as "licoricine" was poisonous or not. For the decision of that question undoubtedly evidence of the quantity of morphine or other poison would have been necessary, and in the trial of a charge of administering an improper dose of medicine, evidence bearing upon the question as to poisonous quantity would be very material.

But that is not the question which has to be decided in a case of prosecution for the illegal sale of poison. The Pharmacy Act provides that certain specified articles shall be deemed poison, and it further provides that it is unlawful to sell those articles, unless the seller be qualified under the Act to sell poisons. It would appear to follow from those provisions that the presence of an article which is a poison within the meaning of the Pharmacy Act being proved, the preparation containing it would fall within the scope of the Act, and its retail sale by unqualified persons would be unlawful, independent of quantity. The provisions of the Pharmacy Act make no reference to quantity; but merely declare certain articles to be poisons, and that their sale shall be restricted to certain persons. In the DELVE case evidence was given that "licoricine" contains morphine, and the only answer to that evidence was the statement that a certain quantity of licoricine does not contain enough morphine to have a poisonous effect. That plea is really beside the question, and it is one which does not admit of legal determination. If it were so, a question would thus be raised as to where the line is to be drawn between the quantity of such a preparation to which the law is applicable and the quantity to which it is not applicable, and the risk attending the attempt to decide when the principle *de minimis non curat lex* might be applied would be very serious. A hogshead of beer containing a grain of strychnine was referred to as an instance in which it would be an abuse of language to call the beer a preparation of strychnine. But even if that proposition be admitted, as well as the possibility that such beer would not be poisonous, it may at least be held that the sale of such beer would be unlawful, and, in fact, a breach of the Pharmacy Act. Moreover, it is not unimportant to recall the fact that the reputed sale of beer made bitter by such an addition of strychnine, has actually given rise to very serious public alarm, and was, on that account, made the subject of special inquiry some years ago.

The more the consideration of quantity is taken into account for the purpose of deciding, with regard to sales of poisons, those which might be admissible on the ground that their effects would not be poisonous, so much the more will the efficacy of the Pharmacy Act, as a means of protecting the public, be reduced and rendered uncertain. If the legality of the sale of small quantities were recognised, the influence of determining circumstances would be the next plea upon which liability under the Act would be disputed, and we might expect to see the sale of morphine, sufficient to poison several persons, defended upon the ground that the purchaser, being addicted to the use of the drug, the quantity sold was not poisonous in his case. In fact, nothing short of a rigid interpretation of the Act appears to be sufficient for ensuring the object for which it was intended—public safety—and any deviation from the strict letter of the law leads to the creation of insuperable difficulties. That the consideration of the poisonous character of an article needs to be excluded from the administration of the Pharmacy Act for other reasons than those arising from the difficulty of determining that point as a matter of law, will be evident from the fact that there are many poisonous substances which are not included in the schedule of poisons within the meaning of the Act. If, for instance, a prosecution were instituted for an improper sale of carbolic acid which had caused death, the defence would be that this article is not in the schedule, and that it is consequently not a poison in the eye of the law. This very limitation of the Pharmacy Act to particular articles appears to be the most cogent reason for its absolute interpretation in regard to those articles which are comprised in its schedule of poisons. The position as it stands at present appears to be that while, on the one hand, a prosecution for the sale of a non-scheduled poison would necessarily fail, although the article sold might be highly dangerous to human life; on the other hand, the prosecution of unregistered persons for the sale of scheduled poisons is in danger of being defeated by a defence alleging that the quantity sold is not dangerous to human life, and by the admission of an argument which has no relation whatever to the policy, object, or specific provisions of the Pharmacy Act.

### PROTECTION AGAINST QUACKS.

THE courageous articles on the "Medical Battery Company, Limited," published in the *Pall Mall Gazette*, have brought into prominence the question of charlatanry as affecting the general public and the medical and pharmaceutical professions. With regard to the public, the chief question is to what extent the government ought to afford protection from unscrupulous quacks; while in the case of the professions it is to be ascertained whether any legal remedy exists against ignorant and unqualified pretenders. In the case of the Indian oculists, the jury declined to convict even on the mitigated charge of obtaining money under false pretences. Thus, although much has been done to open the eyes of the public to the folly of resorting to irregular practitioners for treatment, the moral of the case is that the public must be held responsible for its ignorance and credulity.

It is unnecessary to dilate on the cruelty inflicted on great numbers of indigent persons who, when desperate from grief or sickness, are lured by bombastic and lying advertisements to spend their last penny, and to levy a tax on their friends, in order to obtain some useless medicine. Quite lately a case of this kind was mentioned by a medical practitioner who had learned that an extremely poor patient, to whom he had bidden a last good-bye—death from phthisis being imminent—was induced to expend his last few shillings, and to borrow more from his friends in order to obtain the Rev. So-and-So's "remedy" for consumption. The patient died three days after the doctor's last visit, and twenty-one precious shillings had been thrown away. The phase of the question which interests us most nearly is the manner in which it affects chemists and druggists. From the preparations blatantly puffed, with more or less glamour of romance, by the suggestion of an origin in the wilds of America, or in the brains of some large-hearted dame, or, worse still, with the cant implied in the title "Rev.," borne by the supposed originator of the drug: from such contemptible wares one may pass by easy stages to a host of proprietary preparations, which may just as well be sold by grocers as by qualified chemists and druggists. In this connection the recent decision with regard to KAY's essence of linseed is of importance. Patent medicines are now sold in enormous quantities by ordinary shopkeepers, and this decision would tend to show that the Pharmacy Act provides no unequivocal remedy even when the preparations are of a poisonous nature.

The method of dealing with secret remedies in Germany appears to be simple and efficient, as the following instance shows. Not many months ago some strangers took a house in Berlin, and with great *éclat* gave out that they were prepared to sell a remedy for freckles and pimples at ten shillings a bottle. The day after the opening of the establishment an official notice appeared in the Berlin daily papers under the heading "Police Intelligence," giving the result of the analysis of the drug (it was a weak solution of corrosive sublimate) and the cost of its preparation, namely, three half-pence. The establishment was soon closed. We have cited this instance to suggest one way of combating the enormous increase in the number of so-called patent medicines. If chemists and druggists use every opportunity to acquaint themselves with the results of the analyses of these preparations, and the public with their therapeutic and commercial value, in process of time the few that are of use and represent honest work in their preparation will be retained, whilst those which are worthless will lose their reputation and their market. For the successful repression of quackery a closer union between medical and pharmaceutical practitioners is called for. If medical men would as far as possible depute their dispensing to pharmacists, the prescribing chemist would soon become a thing of the past, and the best interests, both of the public and of the professions, would be served.

### GROCERS AND POISONS.

IN the report of the appeal in the DELVE case, which appears in the *Grocer* of last week, there is an instructive illustration of the kind of fitness possessed by grocers to deal in poisons side by side with tea and sugar and other harmless necessaries, to which their business properly appertains, and of their capability of exercising discretion in dealing with poisons. Mr. Justice WRIGHT's application of what was intended as a commonsense construction of the Pharmacy Act as applying only to things which are not "poisonous" is given in the following words:—

> "They might as well say, if they put an ounce of strychnine into a glass of beer, that it was a preparation of strychnine."

This would be amusing if it did not also convey very grim suggestions, and the exaggeration of Mr. Justice WRIGHT's remark may not be altogether useless in directing attention to the dangers which might be expected to arise from the practical application to the Pharmacy Act of the principle underlying that remark.

## PATENTS AND THE SALE OF POISONS.

The attention which has recently been directed to the subject of the sale of poisons, by Mr. Ernest Hart, through the medium of the *British Medical Journal*, has already been usefully effectual in bringing about more adequate observance of the provisions of the Pharmacy Act. For the services he has thus rendered, qualified chemists and druggists, no less than the general public, have reason to be grateful. The long existing misconception that the term "patent medicine" in the Pharmacy Act was to be understood as applicable to and comprising all kinds of secret medicinal preparations, whether they were the subject of letters patent or not, has now been conclusively dispelled by the decisions in the chlorodyne case, and thus the possibility of systematic infringement of the Act, arising from that source, has been satisfactorily done away with. The obvious meaning and intention of the Act have been so far recognised and upheld by judicial authority; but there is still another point which remains undetermined, and it will, therefore, have to be submitted to the same ordeal of judicial construction. The question which has now to be decided is the extent to which "the making or dealing in patent medicines" is to be held exempt from the provisions of the Pharmacy Act, or, in other words, whether medicines, containing poison, which are, have been, or may become, actually the subject of letters patent, shall be exempt from the provisions of the Pharmacy Act in regard to their retail sale. That is the question dealt with in a recent article in the *British Medical Journal*, pointing out that patents are now being obtained for medicinal preparations containing poison. It is further stated that in the case lately tried in Dublin it has been decided that the preparation containing poison then in question is properly termed a patent medicine, although the patent relating to it is no longer in existence, and that it has been held the sale is not subject to the restrictions imposed by the Pharmacy Act upon the sale of poisons.

On previous occasions it has been contended in the *British Medical Journal*, that by reason of the exemption of patent medicines provided for in the 16th section of the Pharmacy Act, and from regard to the object of that Act, it should of necessity follow that from and after the passing of the Pharmacy Act, the patenting of a medicine containing a scheduled poison was impossible. That conclusion was based upon consideration, on the one hand, of the fact that the retail sale of poison is restricted by the Pharmacy Act, while the validity of a patent depends upon the exercise of the invention to which it relates, not being contrary to law or prejudicial to the Queen's subject, and, on the other hand, that if the exemption of the dealing in patent medicines containing poison extends to their retail sale, the grant of a patent for such a medicinal preparation would be nothing less than a licence to break the Pharmacy Act. This view of the matter is now extended somewhat further, but upon the same principle. From consideration of the limited application of the Pharmacy Act to retail trade, it is argued that the exemption of patent medicines provided for in the 16th section of the Act refers only to wholesale trade in those articles, and that, consistently with the object of the Pharmacy Act as well as the intention of the Patent Acts, the words "dealing in patent medicines" cannot be construed as extending to the retail sale of those containing poison.

That is a view of the matter which has not hitherto been suggested; but it has a reasonable foundation, which strongly recommends it as a possible means of saving the Pharmacy Act from being held to contain within itself a provision absolutely subversive of the particular object for which the Act was passed. As our contemporary remarks it is impossible to suppose that the Legislature, in passing the Pharmacy Act, deliberately, or even inadvertently, produced a measure of such inconsistent nature. Moreover, in support of the argument that such a limited construction should be put upon the words, "dealing in patent medicines," reference is made to the precedent established by Lord Chancellor Selborne in deciding the question as to the legality of company trading. In that case it was held that the precise interpretation of particular words in a statute should be subject to consideration of the context and of the "manifest object" or "policy of the Act" in question. On that principle it was decided to be impossible to infer that the object of the Pharmacy Act required the larger construction of the word "person," which would include corporate persons as well as individual persons. By a converse application of this principle to the sale of patent medicines containing poison, the *British Medical Journal* argues that it is equally impossible to extend the construction of the words "dealing in patent medicines" beyond the range of wholesale dealing—which it was clearly the intention of the Act to exempt in every form—and to make those words include another kind of dealing—the sale of poisons by retail—which it was the special object of the Act to regulate and subject to restriction. We abstain from comment upon this view of the matter at the present time, but think it of sufficient importance to be stated for the information of our readers.

## PHARMACEUTICAL ASSOCIATION AT PLYMOUTH.

It is with much gratification that we learn from the local secretary for Plymouth, Mr. Freeman William Hunt, that at a meeting recently held in that town it was decided to again form a pharmaceutical association for the district. A brief report of the meeting will be found on page 395, and the inaugural meeting, at which officers will be elected, is announced for Wednesday next, at 3 p.m.

## PRACTICAL PHARMACOGNOSY.

THE paper read by Professor GREENISH, at the evening meeting on Wednesday, affords strong evidence of the great value and importance of the histological examination of drugs. This subject has received comparatively little attention in this country until late, and it is doubtful if it has been sufficiently realised that a very extensive and prolonged training is required if such investigations are to lead to exact and practical results. The suggestion made at the meeting—that novel adulterations and substitutions coming into the drug market might with advantage be placed in the hands of advanced students for investigation—requires for its proper consideration a full acquaintance with the methods of histological research and the necessities of the case. Before a student examines any specimen of which nothing is known, it is essential that he should possess a general knowledge, at least, of all recognised drugs in everyday use, and to attain such knowledge he will require to devote much of his leisure time for some years after graduation. This method, of course, is simply the time-honoured one, of proceeding from the known to the unknown, but the idea that the performance of useful practical work in the histology of drugs requires no more preparation than the purchase of a microscope and the random cutting of a few sections is a highly erroneous one. As a matter of fact, the training required, if original work be aimed at, will not fall short of that required by a highly proficient chemist preparing for similar work, and even with that the histologist must frequently rest content with the assertion that a particular sample is not what it purports to be.

More positive results, in many cases, can only be secured by calling in the aid of the systematic botanist, who in turn will require more complete specimens than may be readily available. It is noteworthy, however, that Professor GREENISH, dealing with the minute structure of the leaves alone, and Dr. STAPF, working from the systematist's point of view, should have independently arrived at an almost identical opinion with regard to the origin of the supposed "senna." In Germany much histological work is now being done, which has already resulted in some cases, and will probably result in others, in a re-arrangement of certain natural orders. As pointed out by C. E. BESSEY (*ante*, p. 357), the existing system of plant classification is, in great measure, out of date, and there is little doubt that advanced knowledge of the minute structure of plants will prove no inconsiderable factor in the foundation of a truly scientific system.

It may further be pointed out that in the pursuit of such knowledge, with regard to drugs of vegetable origin, the pharmacist is likely to find at last the direction in which he must develop in order to acquire a full measure of specialisation. As a dispenser of medicines, the quality of which he personally guarantees, the pharmacist has been able gradually to evolve from the position of a mere retailer of drugs and sundry other articles, but for his complete development he requires to attain a more independent position, as has been done in some foreign countries. Instead of posing as a mere hanger-on of the medical profession, or taking an inferior place in the ranks of chemists and botanists, the pharmacist ought to take the position of an independent scientific worker, to whom others might apply for the information he had made peculiarly his own, this information relating to drugs, of which he should possess a knowledge as nearly complete as the means at his command rendered possible. In the field of practical pharmacognosy there is a vast amount of new work to be done and old work to be checked and revised. It is a subject that is peculiarly the pharmacist's own; it yields results that are both definite and eminently practical in their application; and there is no doubt whatever that if patiently and systematically dealt with, the credit both of the individual pharmacist and of the class to which he belongs will be greatly enhanced.

## EVENING MEETING IN EDINBURGH.

AN inaugural sessional address will be delivered before the North British Branch of the Pharmaceutical Society, at 36, York Place, Edinburgh, on Friday next, at 8.30 p.m., by J. THEODORE CASH, M.D., F.R.S., Regius Professor of Materia Medica in the University of Aberdeen. Recent donations and other additions to the Society's Museum in Edinburgh will be shown during the evening by Mr. J. RUTHERFORD HILL, Assistant-Secretary to the Pharmaceutical Society.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

THE annual conversazione of this Association, which is now in its seventeenth session, will be held at the Portman Rooms, Baker Street, W., on Thursday next, at 8 p.m. There will be an exhibition of microscopes, microscopical slides, lenses, and various accessories. In addition, a concert will commence at 9 p.m., and be followed by dancing at 10.30 p.m. Tickets may be obtained of the Honorary Secretary, Mr. H. H. ROBINS, 40, Norwich Road, Forest Gate, E.

## WESTERN CHEMISTS' ASSOCIATION.

WE are asked to remind our readers that the Annual Dinner of the Western Chemists' Association will take place at the Holborn Restaurant on Wednesday next, at 7.30 precisely. It is hoped that chemists who may not be members of the Association will join on that occasion. Tickets may be obtained of the Hon. Treasurer, Mr. T. H. MATHEWS, 1, Queen's Gardens, W.

## BIBLIOGRAPHY OF CHEMISTRY.

RECENTLY, we announced the publication, in the United States, of a select bibliography of chemistry (*ante*, p. 270), and a somewhat similar work is now about to be published by J. B. BAILLIÈRE ET FILS, of Paris. This 'Bibliographie des Sciences Chimiques' will contain the details of more than three thousand ancient and modern works on chemistry, published in French and other languages. The book will form an octavo volume of eighty pages with double columns, and a copy will be sent, gratis and post free, to any chemist who may apply to the publishers for it.

# Transactions of the Pharmaceutical Society.

## EVENING MEETING IN LONDON.

*Wednesday, November* 8.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The first evening meeting of the session was held on Wednesday evening, the chair being taken by the President at 8 o'clock.

The first paper read was by Mr. J. Slinger Ward, on—

### The Collection of Manna in Sicily,

which is printed at p. 381.

Professor H. G. Greenish said, when Mr. Ward told him he was going to Sicily and asked if he could do anything for him, he asked him if he would try and obtain a specimen of manna, which would be more instructive to the students than the one he had, and also to ascertain how the manna was now collected. Perhaps Mr. Ward might feel a little disappointed that there was no improvement on the methods in use thirty or forty years ago, but he did not think he need, and the manner in which it was collected could not have been more clearly described and illustrated. This year he saw a great many wild plants of manna ash, but not of an age to yield manna, and though he made cuts in them in the hopes that a few drops would trickle out, it was in vain. This paper showed how anyone who went abroad might bring back information which was both interesting and useful.

Mr. Murton Holmes asked if Mr. Ward could state the quantity of manna produced in Sicily. It seemed to be going out of use in regular practice, and was now seldom prescribed; he imagined it was mostly used in poor neighbourhoods, where old traditions were kept up. Some medicines seemed to lose their popularity when they became cheap, but manna went out of fashion when it became dearer some twenty years ago through a temporary scarcity.

Mr. Ward said it was difficult to say the amount produced. There was a good deal still used in England, chiefly the long strip kind, but in Italy, where it was largely used, the other sort was more common.

Mr. Umney said the consumption of manna about twenty-five years ago was about 100 tons per annum. This was rather a pet subject with Daniel Hanbury, who, however, he thought investigated the production of Calabria rather than that of Sicily. He read a paper there, and one at the Pharmaceutical Conference at Brighton, when he said very much what Mr. Ward had now stated, having both studied the literature of the subject and visited the districts in which the manna was collected. In the 'Pharmacographia' the shipments of manna to England were stated to be about 100 tons, of course varying with the year; he should imagine the past season, having been so dry, would be very favourable, and that in a rainy year there would be a falling off of 30 or 40 per cent.

Mr. Thomas Greenish said he should be glad if anyone could state precisely what was the origin of the manna in the cell tissue of the tree—what was the particular cell to which the exudation was due. Some years ago he read a paper on the secretion of the pyrexia root, which was a genuine secretion, and another on the goa powder, in which case the exudation was unquestionably due to a breaking up of the entire tissue. It appeared to him that in the case of manna it was the starchy portion which was breaking up, but the question could only be answered by a careful microscopic examination.

Mr. Holmes said it would perhaps throw some light on the question if they knew whether the manna could be procured at all times of the year or only at a certain season. He should also like to know if the manna was sorted in Sicily or in this country.

Mr. Ward said as far as he could judge the exudation only took place towards the end of the summer, during the months he had mentioned. He believed the manna was sorted in Sicily before being packed in tin cases.

Mr. Martindale thought the manna was a secretion similar to that which occurred in the maple as the sap ascended, not from a conversion of the starch cells into sugar.

Professor Attfield said he was inclined to support Mr. Martindale's view. Some ten or twelve years ago he read a paper on an excretion from a silver birch growing in his own garden. It was damaged in the winter, a bough being knocked off, and at the wound there was an icicle formed, which was quite sweet to the taste. As the temperature rose there was a continuous drip of a fluid which was a solution of sugar. He was very glad to have heard this interesting paper.

Mr. T. Greenish said the maple juice or manna ash should of course be examined at the time it was dripping.

The President thought Mr. Greenish's question had not been quite understood. It was not a question of the ordinary sap, but whether the cells containing these secretions, the starch, saccharine matters, and others, all broke away together and formed a mixed mass, or whether there was one particular part only which broke away and became converted into sugar. He was afraid Mr. Greenish's question could not be answered unless he would perform the requisite experiments at the right time. He concluded by moving a vote of thanks to Mr. Ward, which was carried unanimously.

The next paper was by Professor H. G. Greenish on—

### Certain Spurious Drugs Recently Imported,

which is printed at p. 381.

Mr. Holmes said papers of this kind showed the great progress which had been made in materia medica during the last few years, and the great value of histology in the examination of specimens. The supposed senna leaves were shown immediately to be neither senna nor mastic, but to belong to a certain other natural order by their microscopic characteristics. Some of the same leaves were also sent to the Kew Herbarium, and Dr. Stapf recognised that they probably belonged to the Rutaceæ, and searched in the genus *Pilocarpus*, because the leaves were sent as jaborandi. They were much smaller than any known leaves of jaborandi, and not finding any small leaves like those he turned to the neighbouring genera, of which *Xanthoxylum* was the nearest. Of this he had brought one or two specimens to illustrate the matter, one having large leaves and small on the same plant. Looking amongst these leaves he found a specimen bearing no name, except that of *Xanthoxylum*, which came from Rio Janeiro, and those he identified with the leaves now exhibited. It was interesting to find a plant intermediate between the *Xanthoxylum* and *Pilocarpus*, in which, while its leaves were like the *Xanthoxylum*, the flowers were more like the *Pilocarpus*, being arranged in a spiral or spike. It would be described, he believed, in the next issue of the *Kew Bulletin*. With regard to the false sarsaparilla, he might say that a number of species of fern rhizomes were used in South America in the same way as sarsaparilla. With regard to the matico, a great variety of leaves had been sent over from time to time under that name, two of which he had brought with him, one of which Professor Bentley referred to some years ago as spurious matico. He had also a specimen of the true matico as grown in Kew Gardens; the difference in the leaves, both in size and outline, being very considerable. He had tried to identify this particular specimen by searching the herbaria both at the British Museum and at Kew, where he found a specimen from New Granada very like the one now shown. It was numbered 765, but had as yet received no name, not having been described. He would take that opportunity of acknowledging the great courtesy which he always experienced at the National Herbaria, where every facility was put in his way for identifying such fragmentary specimens as were sometimes submitted to him. It was exceedingly difficult, however, for a systematic botanist to identify a leaf alone, without either stem, flower, or fruit. A frequent occurrence was for leaves of totally different plants to resemble each other closely, one instance being that of oak leaves resembling the common holly.

Mr. **Martindale** said he was struck, in tasting one of the leaves of the false senna, to notice the great resemblance it bore to the true jaborandi; it also resembled it in appearance, especially in the little pellucid dots and oil reservoirs which were evident on the leaf, and he should be inclined to believe it belonged to that genus, or one nearly allied to it. It would be interesting to know if it possessed any diaphoretic property like jaborandi, and also if it contained any pilocarpine.

Mr. **Umney**, speaking as a wholesale druggist, expressed his satisfaction at scientific men like Professor Greenish coming into the city and examining the drugs offered for sale. He was glad to find he was charitable enough to say that they had been named through ignorance, and he thought there was no doubt about that. Many of these things were consigned to London simply as roots, and the brokers who had them for sale turned them over to their market clerks, who called them what they appeared to be most like. He remembered the false sarsaparilla being offered for sale, but there was not a single bid made for it, and he thought no one would be likely to purchase it for sarsaparilla. Again, with regard to the mastich leaves, no one who had been trained at Bloomsbury Square would have taken them to be senna. With regard to jalap and ipecacuanha, he might say that the former drug was deteriorating very much. There was great difficulty in getting it up to the resinous standard named in the Pharmacopœia, and he had been tempted to write to Professor Attfield and say that no such thing was to be found, but then you occasionally did meet with it up to the standard. He was quite certain, however, that it was not now to be found up to the standard of twenty years ago, for he remembered a paper about that time on a specimen containing 15, 17, or 18 per cent. of pure resin of jalap, and such was seldom, if ever, to be met with now. He did not think any purchasers had been found for the false ipecacuanha, but they had been more perplexed with pure ipecacuanha than with spurious, and this was a very important matter, considering that this drug was perhaps used more largely than any other, and for diseases which could be combatted with nothing else. It was a very serious matter, therefore, that they really did not know anything about it. Dr. Paul had recently told them that in ipecacuanha there was a second alkaloid, which he was going to bring forward shortly. He had been anxiously waiting to see whether the New Granada ipecacuanha was identical with the Brazilian. It was coming in now very largely from New Granada and Carthagena, and no doubt it contained emetine; they were told it contained another alkaloid also. They had recently been informed in the *Practitioner* that if there was any value in ipecacuanha at all for dysentery it was in the deemetinised drug, and so confusion became worse confounded, and it really seemed a great pity that they knew hardly anything about this drug, which had been in use for so many hundred years.

Professor **Attfield** said he hoped Mr. Umney, or some one in his establishment, would give the results of their examination of jalap in recent years. There had been several papers on the subject during the last twenty-five years, and it had been suggested that the percentage of resin soluble in ether should be lowered, but these were matters in which the wholesale trade alone could enlighten them, and in which the compilers of the Pharmacopœia had rather to follow the pharmacist.

Dr. **Paul**, in reply to the President, said he had had the subject of the alkaloids in ipecacuanha under examination for some time, but it was far too complicated and tedious a matter to allow of his stating any results at present. Before very long he hoped to be able to give some account of his researches.

Mr. **Thomas Greenish** said it afforded him great satisfaction to see that the microscope was at last properly appreciated in the study of materia medica. Such investigations were very important, but they demanded a great deal of time; a leaf had to be examined with regard to its hairs, its upper epidermis, under epidermis, and various other points, and when you had ascertained that it was not what was represented, only half the work was done, for there still remained the much more difficult task of finding out what it really was. He hoped the students of the present day would, in years to come, give some attention to these histological investigations.

Professor **Greenish** said the specimens of *Xanthoxylum* shown by Mr. Holmes did not much resemble the leaf in question, though one he saw at the British Museum was almost identical in size and shape, differing only in its leathery consistence and in the character of the venation. It was very difficult to arrive at definite conclusions working from a leaf only, and he was gratified to find that other authorities with better opportunities of judging had placed it in the same category as he had. Although Mr. Umney said no one would have mistaken the leaf he had referred to for senna, it did bear a great resemblance to jaborandi, though it was at once readily distinguished under the microscope, the same as were the false and true matico, and that was his justification for bringing forward these matters. Ipecacuanha and jalap were certainly two most important drugs, but they would require an immense amount of time for their thorough investigation. The further he prosecuted the microscopic examination of drugs, the more he felt the want of any criterion of truth. If you went to the British Museum or Kew to examine specimens of *Psycotria emetica* they had no roots, and when you examined the literature on the subject you found the most contradictory statements, and the illustrations not always agreeing with the descriptions. Only that day he had compared a leaf which had been in his collection for a good many years with a portion of what was supposed to be the same leaf at the Kew Museum, and found they were totally different. Years ago the microscope was very little used, and therefore the most important means of identification was not available, and that was probably one of the reasons why these specimens of Pereira's, labelled *Psycotria emetica*, were not *Psycotria* at all, but possibly *Richardsonia*.

Professor **Attfield** said he had ascertained from Mr. Umney that probably about twenty specimens of spurious drugs came before him in a year, and he would suggest that specimens of such should be sent to the Society, and that the more advanced students and the members of the Students' Association should make a beginning in the line of original research by examining them microscopically and chemically.

Mr. Holmes said the specimens labelled *Psychotria* were exactly in accordance with the figures and descriptions given in Pereira's work, and no doubt he had followed previous authors in giving the wrong name to the plant. Professor Planchon some years ago came to the conclusion that ipecacuanha was a species of *Richardsonia*. He endorsed Professor Attfield's suggestion, but he might say that he had a large accumulation of material of the kind which he should be glad to place at the disposal of anyone who would examine it.

The President, in moving a vote of thanks to Professor Greenish, said this was probably the first paper on the subject of materia medica treated systematically from a histological point of view, and probably when it was carried further most of the descriptions in text-books, even in Pereira's book and the 'Pharmacographia,' would have to be rewritten. Without investigating the structure of plants it was quite impossible to be quite certain of the particular genus, or even the natural order to which they belonged in many cases, and the great value of the histological methods was shown by the fact that Professor Greenish was able to come to a definite conclusion, even with a solitary leaf, that it was not what it was stated to be. To find out that a thing was not an important drug was really much more important than to go searching after new drugs. In the latter case people were always very careful in the administration, but in the use of that which was supposed to be an old and well-known drug there might be very great danger to the public safety. With regard to the suggestion put forward by Professor Attfield, he would point out that investigations of this sort could not be satisfactorily carried out by students except under proper direction. It was a great mistake for any student to suppose that before he had learnt the use of the microscope properly he should try to find out something new in histology. There was a great deal to be learnt in every branch of their studies first of all. After students had gained sufficient experience, if they would follow Professor Attfield's suggestion no doubt good would come of it, but it must not be supposed that every young student of a few months' standing was competent either to use the microscope or chemical reagents in a way which would be a real service.

The vote of thanks was unanimously accorded, and the meeting then terminated.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 8th inst., the Librarian and Curator presented the following reports of donations to the Society's Libraries and Museum:—

*To the Library in London.*

**City of London College:**
Calendar, 1893-94.

**Owens College, Manchester:**
Calendar, 1893-94.

**Royal College of Surgeons of England:**
Calendar, 1893.

**University College, London:**
Calendar, 1893-94.

**Royal Medical and Chirurgical Society, London:**
Medico-chirurgical Transactions, vol. 75.

**St. Bartholomew's Hospital, London:**
Statistical Tables of Patients during 1892.

**Radcliffe Library, Oxford:**
Catalogue of Books added during 1892.

**H.M. Secretary of State for India:**
Dictionary of Economic Products of India, by Dr. G. Watt, C.I.E.

**Imperial Institute, London:**
Handbooks of Commercial Products, Indian section, sundry numbers.

**Geological Survey of Canada:**
Catalogue of Section 1 of the Museum.

**Government Printer, Perak:**
Perak Museum Notes, Nos. 1-2, by L. Wray, jun., 1893.

*To the Library in Edinburgh.*

**Mr. David Walker, Lawnmarket, Edinburgh:**
The seven books of Paulus Ægineta, translated, 1844-47, 3 vols.

*To the Museum in London.*

**Secretary of the British Medical Association:**
Thirty-three specimens of native medicines from Ecuador.

**Mr. R. Thomson, Bogota:**
Specimen of a resin, of a bitter bark, and of some leaves used to produce a red dye.

**H.M. Secretary of State for India:**
Dictionary of Economic Products of India, by Dr. G. Watt, C.I.E.

*To the Herbarium in London.*

**Mr. R. Thomson, Bogota:**
Specimen of the flowers and leaves of the tree yielding the bitter bark.

## Provincial Transactions.

### MIDLAND PHARMACEUTICAL ASSOCIATION.

The opening meeting of the session of this Association was held at the Grand Hotel, Birmingham, on Thursday, November 2, Mr. Charles Thompson (President) in the chair, and amongst those present were Dr. Charles Symes (Liverpool), Councillor Barclay, Messrs. W. Jones, and R. D. Gibbs (Vice-Presidents), G. E. Perry, A. Southall, F. H. Alcock, W. Southall, Churchill, Arblaster, Campion, Prosser, Ferriday, W. C. Scott, Mackenzie, G. Thonger, T. W. Lowther (Hon. Sec.), and a considerable number of ladies. Letters of apology were read from Mr. W. Gowen Cross, of Shrewsbury, Vice-President of the Pharmaceutical Society, and Mr. G. T. W. Newsholme, of Sheffield, Member of Council of the Pharmaceutical Society.

The Chairman, on behalf of the officers and Council of the Association, expressed their gratification at having their friend, Dr. Symes, with them. He was not known personally to all present, but in the pharmaceutical world his name was so familiar that they might call him their old friend, and as such they offered him a hearty welcome. Before Dr. Symes delivered his address he would ask him, in the name of the Association, to present to Mr. F. H. Alcock, their late Honorary Secretary, a polarimeter, as a token of their esteem on his resigning the office he had so ably filled. That item was not printed on the programme because it had been got up in a very short space of time. Still, that, he thought, would add to the value of the present in Mr. Alcock's eyes.

Dr. Symes, in asking Mr. Alcock to accept the instrument, said that he knew the amount of work that developed upon a secretary of such an Association, and it was gratifying to know that the immense amount of time Mr. Alcock had given to the Association had been of no small value.

Mr. W. Jones said he wished to say that the subscriptions for the present came in spontaneously, and the whole matter was arranged in a few days.

Mr. Alcock, in reply, said that he was obliged to the members of the Association for their expressions of goodwill towards him, and assured them that he was sorry other business had compelled him to resign the post of honorary secretary. He hoped, however, he should be able to do further work for the Association.

The Chairman then said that it was not his intention on that occasion to refer to any of the political subjects which were before them, but there were one or two home subjects which it might be well for him to bring to their notice at the commencement of the session. The first was that they had changed their name, and from the new rules they would see they had changed their method of election. Their object, however, was the same—to secure the general advancement, and promote the interests of all engaged in pharmacy. They wanted the general body of members to second their efforts. They had a splendid set of men on the Council; men ready to work, and work well for the benefit of the craft. A committee was appointed to arrange a series of classes for their junior members, and although on several previous occasions they had failed to make similar classes successful for lack of students, they were attacking the subject again, and he had reason to hope that at no distant date they would arrange a two or three years' course of instruction quite equal to any in the country. Moving around as he had to do in the exercise of his duty as local secretary, he was astonished that their younger men did not join together and form a junior association. There were plenty of them in that city and its neighbourhood to form a strong association, and he was quite sure the older association would give them considerable help and encouragement. They were anxious to do something for the younger men with regard to education if they would show a desire on their part to avail themselves of the privileges provided, or all their efforts would end in failure. He was much surprised at the want of sympathy shown by many members of the trade, who took no interest, or scarcely any, in the questions of importance which were before them. To those gentlemen, who never attended a meeting like that, he appealed to shake the dust from the shelves of their experience, to put new fittings into the pharmacy of their existence, and come out from their own limited nutshells and join them in the forward movement. He had great pleasure in asking Dr. Symes to deliver the opening address.

Dr. Symes, in the course of his remarks, pointed out that whilst provincial medical schools were all prosperous, schools of pharmacy supported by local associations, with the exception of that at Sheffield, were not so. The chief cause of this was doubtless the lack of a compulsory curriculum, but whether this was desirable or not was an open question. One thing certainly was requisite in schools of pharmacy, and that was that practical pharmacy should be taught. Leaving educational for business matters, and referring to the fact that the defunct Chemists' Trade Association was started at Birmingham, Dr. Symes said it seemed appropriate that that city should be the centre from which the later proposal, for the federation of local associations, should emanate. This new scheme deserved serious consideration and hearty support. The federation of provincial pharmaceutical associations would be the means of strengthening their positions, and diffusing knowledge amongst them as to the latest requirements of the physician and surgeon in dealing with disease, as well as sanitation and preventive medicine. This organisation, if accepted in the broad spirit in which it was put forward by its promoters, would not only be of service to them as individuals, but would strengthen and consolidate the whole commonwealth of pharmacy, and at the same time benefit the public.

Councillor Barclay moved "That the best thanks of the Midland Pharmaceutical Association be presented to Dr. Symes for his able and instructive address." He thought he might claim to be the oldest friend Dr. Symes had in that room, and for that reason could speak with some knowledge of the work he had done for pharmacy. The doctor had for thirty years and more been devoting his energies and ability to the cause he had so much at heart, and together they had been associated in many ways. It was a delightful thing to find him, after so many battles, still willing to stand in the forefront and advocate the interest and protection of the brethren of the trade. They knew that whilst he was a member of the Council, although he did not always have it all his own way, he did an immense amount of good work. He thought with him that they could never expect thorough success in teaching, or in getting hold of the students, unless they had classes in which there was an enforced curriculum, and he hoped the members of the trade and the Pharmaceutical Council would look to that and the other important matters Dr. Symes had so instructively dealt with. When youthful character was being formed was the time when the teaching should be given to their students, and then the inculcation of habits of industry and carefulness in their business would be of immense advantage to their young men.

Mr. R. D. Gibbs (Vice-President), in seconding the motion, hoped the important matters Dr. Symes had touched upon would be well considered by all interested in the progress of pharmacy. He believed one of the great difficulties that pharmacists were under was that in the past they had not held up their heads as high as they ought to have done. They had not been making the advances that other trades and professions had, and had not been united in pushing forward their own interests. They had to broaden the basis of their work, and if there was any benefit to accrue to the trade it must come through the Association, which represented pharmacy as a trade.

The President said that he was sure they were all obliged to Dr. Symes for his address. In it he had touched upon many subjects of interest, but time would not allow reference to them then. There were two—federation and representation—which they were taking some active part in, and he would like to say that the scheme of federation had been received very well throughout the country, and there was no reason why it should not benefit the trade at large.

The motion having been unanimously agreed to,

Dr. Symes, in reply, said that he had very little time at his disposal to prepare addresses, but the sentiments he had expressed conveyed his own feelings. They were not only to be read there, but they were exactly what he felt on the subjects stated. With regard to his resignation as a member of the Council, he came to the conclusion he could serve the interests of the trade better outside the Council than in it, and consequently he retired. He rejoiced to see the ladies present, and thought they could urge them on in their cause. If they wanted to carry on anything properly they must have some ladies in it.

The remainder of the evening was occupied with a programme of vocal and instrumental music.

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## LIVERPOOL CHEMISTS' ASSOCIATION.

A meeting of this Association was held at the Royal Institution on Thursday, October 26, Mr. J. Hocken, President, in the chair.

After several miscellaneous communications had been discussed, Mr. Wardleworth produced a package of leaves which closely resembled coca in odour and general character, but were in reality young jaborandi. Mr. Conroy undertook to examine them for alkaloid, and report at the next meeting. Mr. J. J. Smith was unanimously elected President for 1894.

A note was then read by A. C. Abraham, F.I.C., upon "Salicylate of Bismuth." He gave a *résumé* of the literature of the subject, and alluded to its employment in typhoid fever, and the view of some that its value was due to the bismuth which it contained, rather than the salicylic acid. He thought that the contrary view was the more tenable one, and that the antiseptic treatment of typhoid which had proved so successful supported this view. He thought therefore that a true salt containing the maximum of salicylic acid was the desideratum rather than the so-called basic salt. He gave the results of the analysis of some eleven samples, either commercial or of his own manufacture, the results of which showed as great a variation in the amount of base present as had been reported by other writers. In conclusion, he hoped at a later time to complete his researches into the subject.

In the discussion which followed the reading of the paper, the President and Messrs. Conroy, Symes, Smith, and Parkinson took part.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The first meeting of the new session was held on Thursday, November 2, Mr. T. H. Wardleworth, Vice-President, in the chair. There was a large attendance, and sixteen new members were elected. Professor Harvey Gibson delivered an address, which consisted of an exposition of the views of the two great schools of workers on fungi, those of De Bary and of Brefeld. It was pointed out how De Bary's scheme of classification depended on the recognition of sexuality in higher as well as lower fungi, and especially among Ascomycetes, whilst Brefeld's classification recognised no sexuality in groups higher than the Phycomycetes. The lecturer proceeded to show how the new taxonomy traced the various divisions of higher fungi through intermediate groups, such as the Hemiasci and Hemibasidii back to the Zygomycetes, and not to the Oomycetes as advanced by De Bary. It was shown how, starting from sporangia and conidia (or reduced sporangia) as the organs of reproduction among Zygomycetes, the elaboration of the idea of the conidium found its highest development in the Basidiomycetes, whilst the sporangium showed its most marked evolution in the Ascomycetes. The lecturer concluded with a brief account of the researches of Alfred Möller on the fungus gardens of the South American ants.

## PLYMOUTH PHARMACEUTICAL ASSOCIATION.

A meeting was held at Plymouth on Thursday, the 2nd inst., when Messrs. Bailey, Breeze, Cocks, Carveth, Maitland, Netting, Park, Rendle, Roper, Sleep, Uren, Weary, and Hunt were present, and letters were read from Messrs. Allen, Cox, Maurice, and Woods. It was decided to form an association under the title of "The Three Towns and District Chemists' Association," and rules were drawn up on the lines of those of the Glasgow Association. It will be open to employers, assistants, and apprentices connected with pharmacy.

# The British Association for the Advancement of Science.

## ADDRESS TO THE BIOLOGICAL SECTION.

BY REV. H. B. TRISTRAM, M.A., LL.D., D.D., F.R.S., PRESIDENT OF THE SECTION.

(*Concluded from page* 357.)

If there be one question on which the field naturalist may contribute, as lion's provider to the philosopher, more than another, it is on the now much disputed topic of "mimicry," whether protective or aggressive. As Mr. Beddard has remarked on this subject, "The field of hypothesis has no limits, and what we need is more study"—and, may we not add, more accurate observation of facts? The theory of protective mimicry was first propounded by Mr. H. W. Bates, from his observations on the Amazon. He found that the group of butterflies, *Heliconiidæ*, conspicuously banded with yellow and black, were provided with certain glands which secrete a nauseating fluid, supposed to render them unpalatable to birds. In the sand districts he found also similarly coloured butterflies, belonging to the family *Pieridæ*, which so closely resembled the others in shape and markings as to be easily mistaken for them, but which, unprovided with such secreting glands, were unprotected from the attacks of birds. This resemblance, he thought, was brought about by natural selection for the protection of the edible butterflies, through the birds mistaking them for the inedible kinds. Other cases of mimicry among a great variety of insects have since been pointed out, and the theory of protective mimicry has gained many adherents. Among birds, many instances have been adduced. Mr. Wallace has described the extraordinary similarity between birds of very different families, *Oriolus bouruensis* and *Philemon moluccensis*, both peculiar to the island of Bouru. Mr. H. O. Forbes has discovered a similar brown oriole, *Oriolus decipiens*, as closely imitating the appearance of the *Philemon timorlaoensis* of Timor-laut. A similar instance occurs in Ceram. But Mr. Wallace observes that, while usually the mimicking species is less numerous than the mimicked, the contrary appears to be the case in Bouru, and it is difficult to see what advantage has been gained by the mimicry. Now, all the species of *Philemon* are remarkably sombre-coloured birds, and the mimicry cannot be on their side. But there are other brown orioles, more closely resembling those named, in other Moluccan islands, and yet having no resemblance to the *Philemon* of the same island, as may be seen in the case of the *Oriolus phæochromus* and *Philemon gilolensis* from Gilolo. Yet the oriole has adopted the same livery which elsewhere is a perfect mimicry. May it not therefore be that we have, in this group of brown orioles, the original type of the family, undifferentiated? As they spread east and south we may trace the gradation, through the brown striation of the New Guinea bird, to the brighter, green-tinged form of the West Australian and the green plumage of the Southern Australian, while westward the brilliant yellows of the numerous Indian and African species were developed, and another group, preferring high elevations, passing through the mountain ranges of Java, Sumatra, and Borneo, intensified the aboriginal brown into black, and hence were evolved the deep reds of the various species which culminate in the crimson of Formosa, *Oriolus ardens*, and the still deeper crimsons of *O. trailli* of the Himalayas.

It is possible that there may be similarity without mimicry, and, by the five laws of mimicry as laid down by Wallace, very many suggested cases must be eliminated. We all know that it is quite possible to find between species of very different genera extraordinary similarity which is not mimetic. Take, for instance, the remarkable identity of coloration in the case of some of the African species *Macronyx* and the American *Sturnella*, or, again, of some of the African *Campophagæ* and the American *Agelæus*. The outward resemblance occurs in both cases in the red as well as in the yellow-coloured species of all four groups. But we find that the *Macronyx* of America and the *Campophagæ* of Africa, in acquiring this coloration, have departed widely from the plain colour found in their immediate relatives. If we applied Mr. Scudder's theory on insects, we must imagine that the prototype form has become extinct, while the mimicker has established its position. This is an hypothesis which is easier to suggest than either to prove or to disprove. Similar cases may frequently be found in botany. The strawberry is not indigenous in Japan, but in the mountains there I found a potentilla in fruit which absolutely mimicked the Alpine strawberry in the minutest particulars, in its runners, its blossoms, and fruit; but the fruit was simply dry pith, supporting the seeds and retaining its colour without shrinking or falling from the stalk for weeks —a remarkable case, we cannot say of unconscious mimicry, but of unconscious resemblance. Mimicry in birds is comparatively rare, and still rarer in mammals, which is not surprising when we consider how small is the total number of the mammalia, and even of birds, compared with the countless species of invertebrates. Out of the vast assemblage of insects, with their varied colours and patterns, it would be strange if there were not many cases of accidental resemblance. A strict application of Wallace's five laws would, perhaps, if all the circumstances were known, eliminate many accepted instances.

As to cases of edible insects mimicking inedible, Mr. Poulton admits that even unpalatable animals have their special enemies, and that the enemies of palatable animals are not indefinitely numerous.

Mr. Beddard gives tables of the results obtained by Weismann, Poulton, and others, which show that it is impossible to lay down any definite law upon the subject, and that the likes and dislikes of insect-eating animals are purely relative.

One of the most interesting cases of mimicry is that of the *Volucella*, a genus of *Diptera*, whose larvæ live on the larvæ of *Hymenoptera*, and of which the perfect insect closely resembles some species of humble-bee. Though this fact is unquestioned, yet it has recently given rise to a controversy, which so far as one who has no claim to be an entomologist can judge, proves that, while there is much that can be explained by mimicry, there is, nevertheless, a danger of its advocates pressing it too far. *Volucella bombylans* occurs in two varieties, which prey upon the humble-bees, *Bombus muscorum* and *B. lapidarius*, which they respectively resemble. Mr. Bateson does not question the behaviour of the *Volucella*, but states that neither variety specially represents *B. muscorum*, and yet that they deposit their eggs more frequently in their nests than in the nests of other species which they resemble more closely. He also states that in a show-case in the Royal College of Surgeons, to illustrate mining, two specimens of another species, *B. sylvarum*, were placed alongside of the *Volucella*, which they do resemble, but were labelled *B. muscorum*.

But Mr. Hart explains the parisitism in another way. He states that a nest of *B. muscorum* is made on the surface, without much attempt at concealment, and that the bee is a peculiarly gentle species, with a very feeble sting; but that the species which the *Volucella* most resemble are irascible, and therefore more dangerous to intruders. If this be so, it is difficult to see why the *Volucella* should mimic the bee, which it does not affect, more closely than the one which is generally its victim. I do not presume to express any opinion further than this, that the instances I have cited show that there is much reason for further careful observation by the field naturalist, and much yet to be discovered by the physiologist and the chemist, as to the composition and nature of animal pigments.

I had proposed to occupy a considerable portion of my address with a statement of the present position of the controversy on heredity, by far the most difficult and important of all those subjects which at present attract the attention of the biologist; but an attack of illness has compelled me to abandon my purpose. Not that I proposed to venture to express any opinions of my own, for, with such protagonists in the field as Weismann, Wallace, Romanes and Poulton on the one side, and Herbert Spencer and Hartog on the other, "*Non nostrum inter vos tantas componere lites.*"

So far as I can understand Weismann's theory, he assumes the separation of germ cells and somatic cells, and that each germ cell contains in its nucleus a number of "ids," each "id" representing the personality of an ancestral member of the species, or of an antecedent species. "The first multicellular organism was probably a cluster of similar cells, but these units soon lost their original homogeneity. As the result of mere relative position, some of the cells were especially fitted to provide for the nutrition of the colony, while others undertook the work of reproduction." The latter, or germ-plasm, he assumes to possess an unlimited power of continuance, and that life is endowed with a fixed duration, not because it is contrary to its nature to be unlimited, but because the unlimited existence of individuals would be a luxury without any corresponding advantage.

Herbert Spencer remarks upon this: "The changes of every aggregate, no matter of what kind, inevitably end in a state of equilibrium. Suns and planets die, as well as organisms." But has the theory been proved, either by the histologist, the microscopist, or the chemist? Spencer presses the point that the immortality of the protozoa has not been proved. And, after all, when Weismann makes the continuity of the germ-plasm the foundation of a theory of heredity, he is building upon a pure hypothesis.

From the continuity of the germ-plasm, and its relative segregation from the body at large, save with respect to nutrition, he deduces, *à priori*, the impossibility of characters acquired by the body being transmitted through the germ-plasm to the offspring. From this he implies that where we find no intelligible mechanism to convey an imprint from the body to the germ, there no imprint can be conveyed. Romanes has brought forward many instances which seem to contradict this theory, and Herbert Spencer remarks that "a recognised principle of reasoning—'the law of parsimony'—forbids the assumption of more causes than are needful for the explanation of phenomena. We have evident causes which arrest the cell multiplication, therefore it is illegitimate to ascribe this arrest to some property inherent in the cells."

With regard to the reduction or disappearance of an organ, he states "that when natural selection, either direct or reversed, is set aside, why the mere cessation of selection should cause decrease of an organ, irrespective of the direct effects of disease, I am unable to see. Beyond the production of changes in the size of parts, by the selection of fortuitously arising variation, I can see but one other cause for the production of them—the competition among the parts for nutriment. . . . The active parts are well supplied, while the inactive parts are ill supplied and dwindle, as does the arm of the Hindu fakir. This competition is the cause of economy of growth—this is the cause of decrease from disease."

I may illustrate Mr. Herbert Spencer's remarks by the familiar instance of the pinions of the Kakapo (*Stringops*)—still remaining, but powerless for flight.

As for acquired habits, such as the modification of bird architecture by the same species under changed circumstances, how they can be better accounted for than by hereditary transmitted instinct, I do not see. I mean such cases as the ground-nesting *Didunculus* in Samoa having saved itself from extinction since the introduction of cats, by roosting and nesting in trees; or the extraordinary acquired habit of the black-cap in the Canaries, observed by Dr. Lowe, of piercing the calyx of *Hibiscus rosa-sinensis*—an introduced plant—to attract insects, for which he quietly sits waiting. So the lying low of a covey of partridges under an artificial kite would seem to be a transmitted instinct from a far-off ancestry not yet lost; for many generations of partridges, I fear, must have passed since the last kite hovered over the forefathers of an English partridge, save in very few parts of the island.

I cannot conclude without recalling that the past year has witnessed the severance of the last link with the pre-Darwinian naturalists in the death of Sir Richard Owen. Though never himself a field-worker, or the discoverer of a single animal living or extinct, his career extends over the whole history of palæontology. I say palæontology, for he was not a geologist in the sense of studying the order, succession, area, structure, and disturbance of strata. But he accumulated facts on the fossil remains that came to his hands, till he won the fame of being the greatest comparative anatomist of the age. To him we owe the building up of the skeletons of the giant *Dinornithidæ* and many other of the perished forms of the gigantic sloths, armadilloes, and mastodons of South America, Australia, and Europe. He was himself a colossal worker, and he never worked for popularity. He had lived and worked too long before the Victorian age to accept readily the doctrines which have revolutionised that science, though none has had a larger share in accumulating the facts, the combination of which of necessity produced that transformation. But, though he clung fondly to his old idea of the archetype, no man did more than Owen to explode the rival theories of both Wernerians and Huttonians, till the controversies of Plutonians and Neptunians come to us from the far past with as little to move our interest as the blue and green controversies of Constantinople.

Nor can we forget that it is to Sir Richard's indomitable perseverance that we owe the magnificent palace which contains the national collections in Cromwell Road. For many years he fought the battle almost alone. His demand for a building of two storeys, covering five acres, was denounced as audacious. The scheme was pronounced foolish, crazy, and extravagant; but, after twenty years' struggle, he was victorious, and in 1872 the Act was passed which gave not five, but more than seven acres for the purpose. Owen retired from its direction in 1883, having achieved the crowning victory of his life. Looking back in his old age on the scientific achievements of the past, he fully recognised the prospects of still further advances, and observed, "The known is very small compared with the knowable, and we may trust in the Author of all truth, who, I think, will not let that truth remain for ever hidden."

I have endeavoured to show that there is still room for all workers, that the naturalist has his place, though the morphologist and the physiologist have rightly come into far greater prominence, and we need not yet abandon the field-glass and the lens for the microscope and the scalpel. The studies of the laboratory still leave room for the observations of the field. The investigation of muscles, the analysis of brain tissue, the research into the chemical properties of pigment, have not rendered worthless the study and observation of life and habits. As you cannot diagnose the Red Indian and the Anglo-Saxon by a comparison of their respective skeletons or researches into their muscular structure, but require to know the habits, the language, the modes of thought of each; so the mammal, the bird, and even the invertebrate, has his character, his voice, his impulses, aye, I will add, his ideas, to be taken into account in order to discriminate him. There is something beyond matter in life, even in its lowest forms. I may quote on this the caution uttered by a predecessor of mine in this chair (Professor Milnes Marshall): "One thing above all is apparent, that embryologists must not work single-handed; must not be satisfied with an acquaintance, however exact, with animals from the side of development only; for embryos have this in common with maps, that too close and too exclusive a study of them is apt to disturb a man's reasoning power."

The ancient Greek philosopher gives us a threefold division of the intellectual faculties—*φρόνησις*, *ἐπιστήμη*, *σύνεσις*—and I think we may apply it to the sub-division of labour in natural science: *φρόνησις, ἡ τὰ καθ' ἕκαστα γνωρίζουσα*, is the power that divides, discerns, distinguishes—*i.e.*, the naturalist; *σύνεσις*, the operation of the closest zoologist, who investigates and experiments; and *ἐπιστήμη*, the faculty of the philosopher, who draws his conclusions from facts and observations.

The older naturalists lost much from lack of the records of previous observations; their difficulties were not ours, but they went to nature for their teachings rather than to books. Now we find it hard to avoid being smothered with the literature on the subject, and being choked with the dust of libraries. The danger against which Professor Marshall warns the embryologist is not confined to him alone; the observer of facts is equally exposed to it, and he must beware of the danger, else he may become a mere materialist. The poetic, the imaginative, the emotional, the spiritual, all go to make up the man; and if one of these is missing, he is incomplete.

I cannot but feel that the danger of this concentration upon one side only of nature is painfully illustrated in the life of our great master, Darwin. In his early days he was a lover of literature, he delighted in Shakespeare and other poets; but after years of scientific activity and interest, he found on taking them up again that he had not only grown indifferent to them, but that they were even distasteful to him. He had suffered a sort of atrophy on that side of his nature as the disused pinions of the Kakapo have become powerless—the spiritual, the imaginative, the emotional, we may call it.

The case of Darwin illustrates a law—a principle we may call it—namely, that the spiritual faculty lives or dies by exercise or the want of it even as does the bodily. Yet the atrophy was unconscious. Far was it from Darwin to ignore or depreciate studies not his own. He has shown us this when he prefixed to the title-page of his great work the following extract from Lord Chancellor Bacon:—"To conclude, therefore, let no man, out of a weak conceit of sobriety, or an ill-applied moderation, think or maintain that a man can search too far, or be too well studied in the book of God's word, or in the book of God's works, divinity or philosophy, but rather let men endeavour an endless progress or proficience in both." In true harmony this with the spirit of the father of natural history, concluding with the words, "O Lord, how manifold are Thy works, in wisdom hast Thou made them all, the earth is full of Thy riches."

## Parliamentary and Law Proceedings.

### POISONING BY STRYCHNINE.

On Saturday, November 4, Mr. A. F. Vulliamy held an inquest at the Moot Hall, Aldeburgh, on the body of Sarah Amelia Hammond, aged 19 years, domestic servant in the service of Mr. Key.

Kate Hammond, a sister, stated that on Friday morning the deceased told her that she was going out shopping, and after an absence of half-an-hour returned. Witness was subsequently called to the deceased's room, where she lay on the bed, complaining of pains in the head. Deceased made no reply when asked as to what she had been doing. Witness was alarmed, as some paper with a red label had been seen lying on the table, and witness knew that the deceased had been very much depressed lately about "her young man," because she had seen him walking with another girl. Deceased had never shown signs of being deranged.

Laura Annie Hammond deposed that she went up to her sister's room on Friday morning, and saw her writing a note, a paper with a red label lying close at hand. When deceased saw witness she sent her downstairs again. When she returned her sister was lying down. Before the deceased went out shopping, she said to witness, "I shall never be the same girl again."

Mr. John Ing, chemist, stated that the deceased entered his shop on Friday morning, and after having signed her name in the "poison book," was served with a packet of vermin-killer, the girl saying that it was required to destroy the mice at Mr. Key's house. The packet contained about 3½ grains of strychnine.

Dr. Richard Wrightson stated that he found the deceased insensible, with her pupils dilated. He tried to administer an emetic, without success. She then got in a violent tetanic convulsion, which pointed to strychnine. He managed to get her to take a little ipecacuanha, but the least touch caused convulsion. Witness next injected an emetic, which had the desired effect, and upon recovering consciousness the deceased appeared in great dread of death, and said that she had taken the whole packet of poison. Death was due to strychnine poisoning.

William Noy, gamekeeper, said that the deceased came to his house and inquired for his son, who, she said, had not walked with her for three weeks. Witness advised her to go home, and to wait a few more years before thinking of marrying.

Albert Edward Noy, nineteen years old, a gamekeeper, said he had been keeping company with the deceased. He last saw her "Thursday three weeks," when he told her he was not going to keep company with her any longer, as she had been seen with someone else.

The jury returned a verdict of "Suicide by strychnine poisoning whilst of unsound mind."—*East Anglian Daily Times.*

### POISONING BY LAUDANUM.

At the Westminster Hospital, on Friday, November 3, Mr. John Troutbeck, coroner, held an inquiry as to the death of Harry Stone, aged 45, a waiter, who died from the effects of opium poisoning on Thursday last.

Susannah Masters, of 20, Radford Street, Knightsbridge, deposed that the deceased engaged a bedroom at her house on Wednesday last. He retired to rest at about 8 p.m., and the witness saw nothing of him up till eight o'clock the following evening, when, feeling alarmed, she went to his bedroom and found him dead in bed. She at once sent for the police.

Dr. William Evans, divisional surgeon, of 85, Pimlico Road, said that when he reached the house the deceased had been dead some eight hours. The body was drawn up between the blanket and counterpane, the hands being livid and the lips blue. A post-mortem examination revealed about an ounce of brownish thick fluid in the stomach. The two bottles had contained laudanum, and the tumbler also smelt of it. Death was undoubtedly due to opium poisoning.

The jury returned a verdict of "Death from opium poisoning," but added that there was no evidence to show whether it was a case of suicide or not.—*Morning Advertiser.*

## Reviews and Notices of Books.

THE PRINCIPAL STARCHES USED AS FOOD; with a short description of their origin and characters. Illustrated by Photo-Micrography. By W. GRIFFITHS.*

A notice of this useful little book has been delayed though inadvertence and not on account of any question as to its undoubted value. It consists practically of a series of photo-micrographs of the more common starches, accompanied by particulars regarding their botanical origin, geographical source, method of preparation, and uses, together with verbal descriptions where requisite. The magnification in each case is the same (× 160), and it is thus possible to compare the prints with advantage. The photographs are done perhaps as well as it is possible to do them. Starch is always a difficult thing to photograph, on account of the many different planes of the granules in which it is necessary to focus them to represent their appearance fully, whilst objectives tend, in proportion as they are properly adapted for photographic purposes, to represent one plane of an object only. The outline, in starch grains, is therefore the main thing to focus, care being taken to reproduce at the same time as much as possible of the markings, and where, as in the present instance, a number of grains are dealt with at the same time, it may fairly be expected that, whilst some reveal clearly the characteristic shape, others will show the hilum and lines more or less distinctly. The illustrations of *Canna indica* and *C. edulis* are particularly good, whilst special praise must be accorded that of the fruit of potato, representing its appearance with polarised light. Other starches represented are Bermuda, St. Vincent, and Natal arrowroots (*Maranta* sp.); Madagascar and Tahiti arrowroots (*Tacca pinnatifida*); plantain meal (*Musa paradisaica*); tapioca, sago, wheat, barley, rye, Indian millet (*Panicum miliaceum*), oat, rice, maize, pea, haricot bean (*Phaseolus vulgaris*), bean, lentil (*Lens esculenta*), ground nut (*Arachis hypogæa*), tuber and fruit of potato. Since a thorough acquaintance with the appearance of various starches is an important aid in the determination of drug and food adulterations, and also constitutes one of the most essential requirements of the student in pharmacognosy, Mr. Griffiths' book should be found of value by pharmacists generally.

SYPHILIS: ITS TREATMENT BY INTRAMUSCULAR INJECTIONS OF SOLUBLE MERCURIAL SALTS. By EDWARD COTTERELL, F.R.C.S.†

The dainty form and delicate hue of this booklet awaken at a distant view expectations of some literary gem, and it is shocking to find traced in gilt letters on the cover, instead of some title such as "Pearls of Poesy, for Village Maidens," the word "Syphilis." The external attractions of the little volume are unsuited to the subject. The contents, too, are much diluted with space, and are only to be gathered by dint of an unnecessary amount of oculo-locomotion and turning of narrow pages. While we consider the form of the work ill-advised, we find the matter it contains clearly expressed. The author strongly advocates intramuscular injections of mercury in the treatment of syphilis. Bamberger, of Vienna, twenty years ago introduced the subcutaneous method of administering mercury, but relinquished it on account of the severe inflammatory effects. Bamberger's method has been improved by the practice of deeper intramuscular injections, such as are advocated in the little work before us. As the author informs us, other surgeons in this country have successfully practised deep injections of a solution of sal alembroth. Mr. Cotterell uses sozoiodol of mercury, which Professor Schwimmer, of Budapesth, introduced last year. The method of using the drug is clearly stated. Among the advantages claimed for the method are that it ensures a satisfactory administration of the drug and gains the end in view without salivation or intestinal derangement.

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* Cirencester: Baily and Son. Pp. 1 to 62. Crown 8vo. Cloth, 5s. net.

† London: John Bale and Sons. Pp. 36.

## Obituary.

Notice has been received of the death of the following:—

On the 3rd of October, George Myers, Chemist and Druggist, Hull.

On the 12th of October, John Ferris Marshall, Chemist and Druggist, Gainsborough.

On the 14th of October, William Green Christmas, Chemist and Druggist, London. (Aged 45).

On the 26th of October, Thomas Judson, Chemist and Druggist, Ripon. (Aged 75). Mr. Judson was a magistrate of the city of Ripon and an ex-Mayor.

On the 27th of October, George Bywater, Chemist and Druggist, Sheffield. (Aged 72).

On the 27th of October, Edward Carr, Chemist and Druggist, Fakenham.

On the 1st of November, Thomas B. Rhodes, Chemist and Druggist, Croydon. (Aged 63).

On the 2nd of November, Charles Boorne, Pharmaceutical Chemist, Clifton, Bristol. (Aged 66). Mr. Boorne was formerly of the firm of Ferris and Co.

On the 2nd of November, William Selley, Chemist and Druggist, Howden, Yorks. (Aged 70).

On the 3rd of November, Thomas Lewis, Chemist and Druggist, St. Martin's Lane, W.C. (Aged 49).

On the 4th of November, John Woodland, Pharmaceutical Chemist, Clapham. (Aged 41).

*Erratum.*—The death of Mr. John Bell, of Carlisle, occurred on the last day of October, instead of September, as reported last week.

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### A False East Indian Ipecacuanha.

Sir,—In August last I received from Messrs. Lewis and Peat a sample of so-called "E. I. Ipecacuanha." Upon examination this proved to be the same kind of root which had been imported some three years ago, and was at that time readily bought up. Mr. E. M. Holmes has recently briefly described this root in a paper read at the meeting of the British Pharmaceutical Conference in August. Its appearance, although presenting some resemblance to true ipecacuanha, is nevertheless very different from that drug; the general colour is pale pinkish-brown, many of the pieces taper rapidly from base to apex, and the annulations are much closer than in the Brasilian drug, being due to fine transverse wrinkles. Within, the colour is nearly white, and when cut across the structure is seen to be monocotyledonous, consequently without any central woody column. A pocket lens shows the vascular bundles as a more or less irregular ring of dots of a brown colour, within which may often be seen also from four to six bundles of similar colour; the diameter of this ring is commonly about one-third of the total diameter of the rhizome. Microscopic examination reveals abundance of starch and acicular raphides. A preliminary examination having indicated the presence of a minute trace of some alkaloid, I thought it would be interesting to extract this from a larger quantity and apply the usual alkaloidal tests. Two pounds of the drug was exhausted by means of spirit, rendered very faintly acid by tartaric acid, and the spirit removed by distillation. The liquid extract so obtained was then freed from oil and some resinous matter by successive agitation with ether and chloroform while acid, then rendered alkaline by ammonia, and the alkaloid removed by agitation with ether and chloroform; the alkaloidal solutions so obtained were again agitated with acidulated water, and the alkaloid again removed from this by means of ether after rendering alkaline by ammonia. This ethereal solution was allowed to evaporate spontaneously, and the residue dried over sulphuric acid; it weighed 0·34 grain, equivalent to about 0·025 per mille of the original drug. This residue was pale yellowish-brown, semi-solid, possessing a nauseous and acrid taste, readily soluble in rectified or proof spirit, or in dilute acids; the spirituous solutions react strongly alkaline to litmus, but neutral to phenol phthaleïn. The subjoined table indicates its reactions, so far as they could be observed with the small quantity at command, side by side with those given by the alkaloid obtained from ipecacuanha under similar conditions.

| | False. | True. |
|---|---|---|
| Dry alkaloid treated with— | | |
| Sulphuric acid. | Bright brown, becoming rather darker on water-bath. | Very pale yellow, becoming pale brown on water-bath. |
| Hydrochloric acid. | Yellow ppt. forms which is soluble on slight dilution. | No coloration. |
| Nitric acid. | Yellow. | Pale orange brown. |
| Fröhde's reagent. | Brown. | Pale yellowish-pink, becoming greenish. |
| Do. +HCl. | Yellow. | Greenish-blue, becoming rose; green at edges. |
| Solution in dilute HCl with— | | |
| Auric chloride. | Pale yellow ppt., insoluble when warmed. | Yellow ppt., soluble when warmed. |
| Platinic chloride. | Yellowish ppt., soluble in spirit. | Pale yellow ppt., soluble in spirit. |
| Mayer's solution. | White ppt. | White ppt. |
| Iodine in KI. | Bright brown ppt. | Bright brown ppt. |
| Potassic chromate. | Yellow ppt. | Yellow ppt. |
| Chlorinated lime. | Slight white ppt. | Orange solution, then yellow ppt. |

In addition to this alkaloid the drug contains abundance of mucilage and a reducing sugar, as well as starch.

*Hayward's Heath.* R. A. Cripp.

### LATE FLOWERING PLANTS.

Sir,—I beg to append a list of wild plants observed in flower in Surrey on October 28 and 29, which may be of interest to some of your readers. As vegetation has been so much more forward this year, this may be considered as a second crop:—*Ranunculus acris*, *Thlaspi arvense*, *Helianthemum vulgare*, *Lychnis diurna*, *L. vespertina*, *Rubus fruticosus*, *Apium nodiflorum*, *Pastinaca sativa*, *Scabiosa columbaria*, *Carduus acanthoides*, *Senecio Jacobæa*, *Centaurea nigra*, *Campanula rotundifolia*, *Phyteuma orbiculare*, *Solanum nigrum*, *Verbascum nigrum*, *Veronica Beccabunga*, *V. Buxbaumii*, *Origanum vulgare*, *Ballota nigra*, *Polygonum bistorta*, *Corylus avellana* (male catkins).

*London.* W. MURTON HOLMES.

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### CHINA AND THE OPIUM TRADE.

Sir,—In the Journal for October 14, p. 302, there is a sneer by a British Consul at "those moralists who so strongly oppose" the opium traffic which I think should not pass without comment. Even if it were admitted to be a debatable point whether the use of a weaker opium is more injurious than the use of a stronger one, our grave national responsibility is not to be so easily disposed of. The government of this country has acknowledged that the unrestricted sale of opium is harmful, and has fenced it with precautions, putting the charge of seeing them enforced into the hands of the Pharmaceutical Society. Its organ, therefore, seems a strange place in which to find an opposite policy advocated in the East; for surely opium is a poison, and harmful in India and China as well as at home, and to sell it freely in our own possessions is unjustifiable. Ever since the war of 1841 China has been compelled to admit our opium, and though the highest authorities would gladly do all in their power to suppress its use, they say they "cannot take the first step," because of English action; past conflicts with England having been so disastrous that they dare not risk another. If it be true that the use of opium by the Chinese is so widespread that it cannot possibly be suppressed, that fact would only make our national responsibility for having fostered the taste more terrible still. To supply China with it, and to excuse ourselves by saying if we do not they will grow it themselves, is as sensible as selling a man arsenic to commit suicide with and then saying "if he did not buy arsenic he would buy a rope and hang himself, therefore we may as well have the profit of the sale."

*Kettering.* J. T. THURSFIELD.

*** Our correspondent is mistaken in supposing that the views expressed in the extract he refers to are necessarily advocated by the Journal. The extracts from Consular Reports on this subject have been published for the sake of conveying information.—[ED. *Ph. J.*].

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### "AN IMPROVED TEST FOR ARSENIATES."

Sir,—It is always interesting to note any progress that is made in chemical analysis, more particularly in the detection and estimation of the poisonous metals. I fail, however, to detect the novelty in Mr. Lothian's note on arseniates. The action of thiosulphate and of hydrosulphuric acid on arsenic solutions is a subject which has been pretty well investigated, and I have frequently seen the thiosulphate of soda used as a reagent for reduction and detection of arsenic acid.

*Edinburgh.* D. B. DOTT.

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### DISPENSING QUERY.

Sir,—Will any of your readers be kind enough to state the reaction that occurs in the following mixture:—

℞ Tr. Ferri Perch. ................ʒij.
Liq. Strych. Hyd................♏xl.
Pot. Iodidi.........................ʒj.
Mag. Sulph. ......................℥ss.
Aq. Dest. ad......................℥vi.

FIAT LUX.

### DISPENSING QUERY.

Sir,—When a physician orders as follows: ℞ Pil. opii, gr. ¼, j3 tis horis, can there be any other correct dispensing than pil. saponis co. B.P.? The prescriber lives at a distance.

*London.* MAJOR.

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*A. Cruikshank.*—To make exactly four fluid ounces of a *real* five per cent. solution of mercuric chloride, you would require in the first place to know the weight of a fluid ounce of a solution of that strength. If, however, you were to dissolve 92 grains of the salt in sufficient water to make 1840 grains altogether, you would have a true five per cent. solution, the volume of which would probably be but slightly in excess of the quantity you require.

*William Mount.*—Your letter has been handed to the Secretary of the Pharmaceutical Society, to whom it should have been addressed.

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## NOTICES OF MEETINGS NEXT WEEK.

### TUESDAY, NOVEMBER 14.

*Photographic Society of Great Britain.*
"Photography in Coal Mines," by H. W. Hughes.
"On the Range of Light impinging on a Plate during Exposure in the Camera," by Professor W. K. Burton.

### WEDNESDAY, NOVEMBER 15.

*Western Chemists' Association, of London.*
Annual Dinner at the Holborn Restaurant.
*Society of Arts*, John Street, Adelphi, W.C.
Opening Address, by Sir Richard Webster.
*Brighton Junior Association of Pharmacy*, at 9 p.m.
Social and Musical Evening.
*Royal Microscopical Society*, at 8 p.m.
"New British Freshwater Algæ," by W. West.
"On the Value of Aperture in Microscopical Research" (with lantern illustrations), by T. F. Smith.
"A Parasitic Disease in Flounders," by G. Sandeman.
*Plymouth Pharmaceutical Association*, at 8 p.m.
Inaugural Meeting and Election of Officers.

### THURSDAY, NOVEMBER 16.

*Chemists' Assistants' Association*, at 8.30 p.m.
Annual Conversazione.
*Chemical Society*, at 8 p.m.
"The Normal, Butyl, Heptyl, and Octyl Esters of Active Glyceric Acid," by Professor Percy Frankland and John MacGregor.
"The Ethereal Salts of Diacetyl-glyceric Acid, in their relation to Optical Activity," by Professor Percy Frankland and John MacGregor.
*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"The Carbo-Hydrates," by E. Williams.

### FRIDAY, NOVEMBER 17.

*Pharmaceutical Society, North British Branch*, at 8.30 p.m.
Inaugural Address, by Professor J. T. Cash.

### SATURDAY, NOVEMBER 18.

*Pharmaceutical Football Club v.* Wood Green, at Wood Green, at 3.15 p.m.
Reserves *v.* Wood Green Reserves, at Shepherd's Bush.

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## BOOKS, ETC., RECEIVED.

AMBER: ALL ABOUT IT. By J. G. HADDOW. Pp. 59. Liverpool: Cope Brothers and Co. 3*d.* From the Publishers.

EVERYBODY'S LETTER WRITER. By PENHOLDER. Pp. 1-128. London: Saxon and Co. 6*d.* From the Publishers.

ZUR WIRKUNG DES TRIONALS. Von Dr. OSCAR COLLATZ. Sonderabdruck aus der Berliner klin. Wochenschr. Pp. 4. From the Author.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Abraham, Addison, Charles, Cracknell, Hill, Newsholme, Thompson.

## PRACTICAL PHARMACOGNOSY.

### THE SCOPE OF PHARMACOGNOSY.

Pharmacognosy treats of the botanical or zoological origin, geographical source, history, formation or secretion, collection and preparation, description, histology, chemical composition, and adulteration or substitution of drugs. It has been briefly defined as implying a scientific knowledge of drugs, and has thus a much wider scope than the sister subject pharmacology, which is concerned only with the physiological action of drugs, whilst a wide acquaintance with its subject matter is essential to the scientific development of pharmacy, which deals with the technical manipulation of crude drugs to render them fit for use in medical practice.

It will be found that, although pharmacognosy undoubtedly constitutes a distinct subject of study, its limits are not very sharply defined. A good idea of what may be regarded as suitable limitations can be gathered from Flückiger and Hanbury's 'Pharmacographia,' which so far as it goes is an ideal work on pharmacognosy. With regard to origin it is usually sufficient for the pharmacognosist's purpose to definitely know what is the particular plant (or animal) that furnishes the drug, the part used, and most suitable time of collection. Anything beyond this falls strictly within the province of the botanist (or zoologist). Then, since climate, soil, etc., are often factors of importance, in their bearing upon the development of plants and animals, the statement of origin must be supplemented by naming the geographical source also. A knowledge of the history of drugs is of value, inasmuch as, if the introduction of each substance into medicine and its subsequent career can be satisfactorily traced, it is possible more readily to ensure the identity of modern specimens offered under the same names. Again, acquaintance with the methods of formation, collection, or preparation of a drug serves as an aid in determining its quality and freedom from improper admixture. As regards chemical composition, that should be dealt with in connection with pharmacognosy so far as may be necessary only, a knowledge of proximate principles and their characters being of chief importance. Methods of isolation of alkaloids, glucosides, etc., and the determination of the amounts of these present in drugs, fall properly within the domain of chemistry as applied to pharmacy.

### HISTOLOGY OF DRUGS.

But it is familiarity with the physical characteristics of drugs that is of most direct application and practical importance, though this does not attain its greatest value unless based upon a thorough knowledge of the botany, chemistry, etc., of the subject. For the most part it has been considered sufficient in this country to describe general physical characteristics, such as colour, taste, odour, etc., as revealed to the unaided eye or by the assistance of a simple lens. The progress of science, however, has reacted upon this subject as upon so many others, and both investigators and students have realised that a more or less complete knowledge of the minute structure of drugs is a practical necessity. This, of course, entails the use of a microscope, with accessories for use in drawing and measuring minute details, and for examining objects by the aid of polarised light.

It may be well to outline briefly such a course of study in the histology of drugs as may be followed with advantage by students in pharmacognosy. In the first place, it is requisite to be thoroughly acquainted with the appearance and reactions of isolated structures, such as starch granules, glands, crystals, etc., in their several varieties. Then the various kinds and forms of cells, vessels, and cavities must be similarly studied, in the differently constituted tissues of which they form part. These tissues, again, with their constituent parts, vary greatly in development and arrangement in distinct plants. It becomes necessary, therefore, to examine them under as many different aspects as possible, so as to ensure identifying them without risk of error when found under conditions that are at all novel. Finally, after this preliminary training, the systematic and detailed examination of individual drugs, together with their adulterations and substitutions, will remain to be performed.

### NECESSITY OF PROLONGED TRAINING.

Without such an extensive acquaintance with the details of structure in roots, stems, leaves, etc., observed under varying conditions, and a sufficient grasp of the arrangements of tissues in plants generally, no examinations of the structure of drugs can be expected to yield any results of permanent value, and the whole of the ground specified should be covered by pharmacists if they would attain a definite and unassailable position as specialists in their own particular department of activity. As pointed out in Flückiger and Tschirch's 'Principles of Pharmacognosy,' "in order to obtain a satisfactory knowledge of vegetable drugs, an accurate anatomical study of them is in most cases indispensable." Otherwise, it is certainly not possible to properly fulfil the primary object of pharmacognosy, which was defined by the late Professor Maisch as being "to enable us to recognise drugs, to determine their quality, to detect their adulterations, and to distinguish the characteristic elements of those which are closely allied."

In the following articles it is proposed to deal systematically with the elementary histology of vegetable drugs, in as complete and practical a manner as the space available and the necessities of the subject may permit. It is hoped that students in pharmacognosy may thus be aided in their endeavours to acquire that facility in the recognition of details, which is essential to the performance of accurate work. At the outset, it may be well to reiterate that a prolonged training is an absolute necessity to enable the eye, whether unaided or assisted by optical arrangements, to recognise a given structure under any and all conditions. To ensure accuracy in observation, sketches should be made of all tissues examined, the different elements being denoted by means of pencils of various colours, whilst reagents and stains should be applied in a systematic manner, and never used except for some definite purpose. Above all, nothing must be taken for granted, the aim of the worker being to convince himself in the fullest manner possible of the reality of all that is seen, and to overlook nothing that is present. A sound judgment can only be acquired if based on a wide experience, and it must ever be borne in mind that,

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in the present state of knowledge in this subject, it will frequently happen that the most that can be said of a specimen under examination is that it is not what it was supposed to be. More definite results than this, though now attainable in many instances, can only be obtained generally as the outcome of extended investigations by a large number of patient, persistent, and accurate workers.

### *Useful Works of Reference.*

Flückiger and Hanbury's 'Pharmacographia' (Macmillan and Co., London); Flückiger and Tschirch's 'Principles of Pharmacognosy' (Wm. Wood and Co., New York); Poulsen's 'Botanical Micro-Chemistry' (S. E. Cassino and Co., Boston); Moeller's 'Pharmakognostischer Atlas' (Julius Springer, Berlin); Maisch's 'Organic Materia Medica' (Hirschfeld Bros., London); Vogl's 'Anatomischer Atlas zur Pharmakognosie' (Urban and Schwarzenberg, Vienna).

## REMARKS ON THE CHEMISTRY OF BACTERIA.[*]

BY R. WARINGTON.

The immense variety of substances produced in the vegetable kingdom has always been a source of astonishment to the chemist. The plant is, indeed, the finest chemical laboratory with which we are acquainted. While some kinds of chemical work are common to all plants, there is hardly a species which does not possess some special capacities—which does not produce some products different from its neighbours. When we survey the whole vegetable kingdom, the extent to which this specialisation is carried, and the immense variety of the products obtained become simply overwhelming. Chemists are still unacquainted with the larger part of the substances produced by plants. When we turn from the products of plant work to the materials employed our wonder still increases, for these materials are of the simplest kind—water, carbonic acid gas, oxygen, nitric acid, and a few inorganic salts—yet out of these the whole of the immense variety of vegetable products is constructed.

This being the case, we need hardly say that the methods of plant chemistry are of supreme interest, both to the chemist and to the vegetable physiologist. By the aid of what forces, through what course of reactions, are the simple materials moulded to their final issue? The higher plants are in some respects unfavourable subjects for the study of plant chemistry. Their different parts have different functions, and the changes in progress are obscured to the student by the fact that changes of a very different type are in progress at the same time, and in places very near to each other. What would not the physiologist give if he could isolate a single cell, and grow it by itself in solutions of known composition; when by studying the nature of the cell's new growth, and the variations taking place in the nourishing solution, he might hope to be able to grasp the facts of cell nutrition, and the nature of its waste products? Such an opportunity is actually afforded when we study the chemical changes brought about by bacteria.

In bacteria we have the vegetable cell in its simplest form: we have a mass of protoplasm and a cell-wall, but the cell is single or united with a few others, and, as far as we know, the life changes in all the cells of every species living under the same conditions are the same. Moreover, these organisms grow freely in suitable solutions, and the chemical changes produced in the materials held in these solutions can be readily ascertained. We have thus in a study of the chemistry of bacteria a splendid opportunity for enlarging our knowledge of plant chemistry, and, indeed, of becoming acquainted with the fundamental reactions on which synthetical organic chemistry depends.

The study of the chemical work performed by bacteria has occupied as yet but a few years, but the results have been most remarkable. The immensely numerous species of bacteria have been found to exhibit an almost equally great diversity of action. Different members of the class have been found to flourish under entirely opposite conditions, to feed on wholly different materials, to perform an immense variety of chemical work upon the media in which they live, and yet the chief product of plant life—the formation of protoplasm and cell-wall—is probably in each case practically the same. The study of the chemistry of bacteria has thus greatly enlarged our conceptions of the chemical power of the vegetable cell.

As a contribution to the discussion to-day, I propose to call attention to the chemical actions displayed by three species of bacteria existing in the soil, and all of first-class importance in their relations to agriculture.

It is well-known that all ordinary soils contain organisms possessing a vigorous power of oxidising—of bringing about a combination between the oxygen of the air and various organic and inorganic bodies. Thus dead vegetable and animal tissues in soil are, under favourable conditions of heat and moisture, resolved into carbonic acid, water, and nitric acid.

Particular experiments show that the nitrogen of albumin, gelatin, asparagin, urea, ammonia, ethylamine, and thiocyanates is converted by soil into nitric acid. Nor is the action confined to organic matter; for nitrites are oxidised to nitrates, iodides to hypoiodites and iodates, and bromides to hypobromites and bromates.

The organisms producing nitric acid have been made the subject of study by many chemists, and after much labour and many disappointments they have been satisfactorily isolated.

We now know that the production of nitrates in the soil—a process of the greatest importance for the nutrition of agricultural crops—is accomplished by the action of two organisms, each of which performs a distinct stage in the work. By one organism ammonium carbonate is oxidised and the nitrogen converted into a nitrite. By the second organism nitrites are converted into nitrates. We have here an excellent example of the way in which certain special functions, certain narrowly limited lines of work, are exercised by individual species of bacteria. The nitrous organism can oxidise ammonia to nitrite, but it cannot change a nitrite into a nitrate. The nitric organism, on the other hand, oxidises nitrites readily, but it cannot oxidise ammonia. Both organisms are present in all fertile soils, but the formation of nitrites is not usually perceived, as they are at once converted into nitrates.

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[*] A Paper read before a Conference of Sections B and D, Nottingham Meeting, 1893. Reprinted from the *Chemical News*.

The organisms we have mentioned grow and exercise their functions in dilute solutions of appropriate composition, and it is therefore possible to study exactly the mode of their nutrition.

Like every other living organism, they develop and perform their functions only when certain inorganic salts supplying phosphates, sulphates, potassium, calcium, and magnesium are present. The continued omission of one of these has been proved in several cases to bring about a cessation both of growth and function. The general fact is familiar to physiologists, but it is singular that we have as yet no rational idea of the mode in which these various inorganic bodies assist in plant nutrition, with the exception of the fact that sulphur, and possibly in some cases phosphorus, are constituents of albuminoid bodies.

As to nitrogenous food, these organisms are amply furnished by the ammonia, the nitrite, or nitrate which is intentionally added to the solution; the addition of no other nitrogenous substance is necessary. Here, too, we are on familiar ground. Ammonia and nitrates are both well known as the most appropriate nitrogenous food for plants.

When we inquire, however, what is the source of carbon to the nitrifying organisms, we are confronted by a startling novelty. It is found to be quite unnecessary to supply these organisms with any carbonaceous food save carbonates, bicarbonates being preferred. The fact of the conversion of carbonates into organic cell substance has been conclusively proved in the case of the nitrous organism; it is at present assumed to be also true of the nitric organism, as this also requires the addition of no organic carbon to its nutritive solution.

The fact that green plants exposed to sunlight are capable of forming organic substances from the carbonic acid and water of the atmosphere is well-known to physiologists, but it is equally certain that this action does not occur in the dark. Yet here we have a colourless cell, destitute of chlorophyll, growing in the dark, which, nevertheless, is capable of decomposing carbonic acid, and producing from it carbonaceous cell-substance. From a purely chemical point of view this reaction may well appear at first sight incredible, as the decomposition of carbonic acid is an action requiring the consumption of much energy, which in the case of the green plant is supplied by the sun's rays, but in the case of the nitrifying organism is supplied in no such way.

This theoretical difficulty disappears, however, when we look at the whole reaction brought about by the nitrous organism. This organism attacks carbonic acid in its combination as ammonium carbonate, and the formation of an organic carbon compound proceeds at the same time as the oxidation of the ammonia; the result of the whole reaction being the liberation of heat, and not its consumption. A supply of external energy is thus not required.

Expressed in its simplest terms, the green plant manufactures carbohydrates from carbonic acid and water by a consumption of solar energy as follows:—

$$CO_2 + H_2O = CH_2O + O_2.$$

The nitrous bacterium oxidises ammonium carbonate, producing at the same time ammonium nitrite and a carbo-hydrate; this reaction we may express in its simplest form as follows:—

$$(NH_4)_2CO_3 + O = NH_4NO_2 + CH_2O + H_2O.$$

The equation, however, by no means fully expresses what actually occurs, as Winogradsky finds that 35 parts of nitrogen as ammonia are oxidised for one part of carbon assimilated; the whole reaction is thus strongly exothermic.

The nitric organism multiplies more slowly than the nitrous, and does not therefore afford so good a subject for quantitative experiments; its nutrition has not yet been fully studied.

The last organism I wish to speak of is the one of which Winogradsky has given a preliminary description during the present summer. It has been obtained from soil, and possesses the remarkable power of assimilating the free nitrogen of the atmosphere. To accomplish this assimilation it is simply necessary to grow it in a solution containing sugar (dextrose) and the necessary salts, no combined hydrogen being supplied. Under these circumstances a vigorous growth of the bacillus takes place, the sugar undergoes a butyric fermentation, and at the end of the operation it is found that the culture has acquired nitrogen, the amount being apparently about $\frac{1}{500}$th of the weight of the sugar fermented. By using as much as 7 Grms. of sugar, an assimilation of 14 Mgrms. of nitrogen has been obtained. Washed air, free from ammonia and nitrates, was used in these experiments.

That a vegetable organism should be able to acquire from the air the whole of the nitrogen which it needs is certainly very remarkable, and is an extraordinary fact both to the physiologist and chemist.

We have no clue as yet to the mode in which the nitrogen enters into combination; but it is evident that in this case, as in the nutrition of the nitrous organism, the difficult piece of chemical work forms but a small part of a much larger reaction that is at the same time in progress, and with which it is essentially connected.

It seems not improbable that these results of Winogradsky will explain some facts which have hitherto presented much difficulty. That a special organism, when in union with the roots of a leguminous plant, is capable of bringing about the assimilation of the free nitrogen of the air is now admitted by all; but it is denied by Schlœsing and other accurate observers that the same organism when living in the soil has any such property. May we not suppose that for the assimilation of nitrogen to occur the organism must be supplied with sugar or its equivalent, and that this supply of sugar to the organism only takes place when the organism gains access to the sap of one of the higher plants.

In conclusion, I think we shall all agree that, however imperfect is our knowledge of the chemistry of the three species of bacteria we have considered, the facts which have been established have at least enlarged our conception of the capabilities of a vegetable cell, and I trust that some light has also been thrown on the general method by which some of the extraordinary chemical results are attained.

### INDIGO CULTIVATION IN THE STRAITS SETTLEMENTS.

In a report upon the Straits Settlements, the Belgian Consul-General at Singapore, dealing with the question of the cultivation of indigo, says:—At Singapore, production is much below the demand, and if a method for the more intelligent and more careful extraction of the indigo than the Chinese method were adopted, the profits on the supplies to the European markets, which take nine-tenths of their indigo from India, would be very considerable. The climate of the Malay Peninsular is, in fact, more favourable to the cultivation of the indigo, which is reproduced without any difficulty by simple cutting. In India seeds only are made use of for the reproduction of the plant, which is much more costly, since at each crop it is necessary to re-gather the seed, work the ground, roll and sow it. At Singapore the cutting is planted without any special care; it requires neither attention nor manure for six years, and the harvest takes place every four months, whilst in India it only takes place after five or nine months. As there exists no dry season under the equator, the plant is perpetual, and is not exposed, as in India, to the total destruction of the crops by the prolonged droughts. In order to extract the indigo, the Chinese are content to plunge twenty bundles of a foot in diameter for twenty-four hours into a wooden tub filled with water. These bundles are stirred with the aid of a kind of rake in a continuous manner, and then withdrawn from the tub. The indigo is then precipitated by pouring into it a certain quantity of lime-water (obtained by the calcining of sea shells). The whole is left for the night, the excess water is withdrawn, and the deposit which constitutes the indigo is ready to be sent to market. In spite of the defective process just described the yield per acre and per annum is valued at 136 dollars. In India the precipitation of the indigo is obtained by oxidisation; the product is very pure, whilst the indigo obtained by the Chinese process contains numerous impurities coming from the lime-water at first, and then from the usually foul and dirty water used by the Chinese.—*Board of Trade Journal.*

### AMBER.

The supply of amber during 1892 was limited to the output from the mine in East Prussia, and is practically a monopoly. The small quantities found at other spots along the coast between this and Memel do not pay the working expenses. Attempts have been made to induce the German Government to cancel the mining concession that is held by the firm who have the monopoly, but as yet without success. About 60 tons of raw amber came to Dantzig.—*Consular Report,* 1299.

### OPIUM IN TURKEY.

In 1891 the yield amounted to 181,250 lbs., 172,550 lbs. of which was exported to England principally, at about 9*s.* per lb. f.o.b. In 1892, owing to unfavourable climatic conditions, it decreased to 152,250 lbs., of which only 130,000 lbs. was exported at 8*s.* 6*d.* per lb. f.o.b. The crop of the present year has produced about 80,000 lbs., owing to a large percentage of the poppy plants having been destroyed by frost in March and April. The news that was circulated in Constantinople in October, 1892, that a syndicate of bankers was trying to obtain from the Ottoman Government a monopoly of opium caused considerable anxiety to the mercantile community of Salonica, and some merchants, who are interested in the opium trade with England, addressed a petition to this Consulate-General setting forth the great injury this trade would suffer from such a monopoly. His Excellency Her Majesty's Ambassador, to whom the petition was forwarded, at once took action in the matter, and received the formal assurance of the Sublime Porte that no decision on the subject will be taken without consultation with the Department for Foreign Affairs, and in no case will the decision arrived at be contrary to treaty stipulations.—*Consular Report,* 1310.

### DETERMINATION OF WATER IN SYRUPS AND MASSECUITES.

BY A. JOSSE.

White filter paper is cut into strips of 1–2 Cm. wide to a total length of about 3 M. A spiral is formed out of these strips, after they have been previously folded so that the windings of the spiral do not adhere to one another. This spiral is then placed in a metallic capsule 2 Cm. high and about 7 Cm. in diameter, provided with a tightly-fitting cover. The paper has thus a surface of 1 sq. m. and can absorb 100 C.c. of liquid. The capsule containing the spiral is dried in an oven, and, after placing the cover upon it, its weight is ascertained. The spiral is then removed, and a portion of the substance (about 2 Grms.) weighed out in the capsule, 6–8 Grms. of water added, and the substance dissolved at a gentle heat; the solution is then absorbed by the spiral. Care must be taken that none of the solution is left on the bottom of the capsule. The capsule and its contents are then heated at 100°–110° until the weight remains constant, which occurs in about two hours, when the lid is replaced, and after cooling the weight determined. The method is applicable to all substances which are difficult to dry, such as glucose, honey, wine, beer, etc.—*Bull. de l'Assoc. des Chim.*, x., 656, through *Jour. Soc. Chem. Ind.*

### ADULTERATION OF BEESWAX IN MOROCCO.

The quantity of candles imported during 1892 is about double that of any previous year, 98 per cent. coming from England. I learn that a considerable portion of these, which are all paraffin of inferior quality, are diverted from their legitimate use in Fez, and employed in adulterating beeswax, it being more convenient to use paraffin in this shape, as it averts suspicion.—*Consular Report,* 1304.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, NOVEMBER 18, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE HARDSHIPS OF CHEMISTS' ASSISTANTS.

A correspondent of the *Echo*, describing himself as "A Chemist's Assistant," has written to that paper with the object of making known what he conceives to be the troubles of the class to which he belongs, thinking that no one has yet heard of them. At the outset he betrays some misconception of their position by styling them sons of ÆSCULAPIUS; but in the subsequent enumeration of the grievances of chemists a still greater want of correct appreciation is shown. It is stated that chemists' assistants are required to have, in the first instance, a good education, then to pay as apprentices a more or less heavy premium, and to serve an apprenticeship for which they do not get one penny piece. After that has been done it is stated that the apprentice is worse off than any workman, since he has to pass an examination for which he has to pay two guineas. If he fails to pass he must go up again and again until he does pass, and each time there is a further payment to be made. When the examination is passed it is stated that the position of junior assistant is reached, with the possibility of obtaining a salary of fifteen to twenty shillings a week outdoor. If unwilling to remain in that position all his life another examination must be passed and more fees paid in order to become a fully qualified chemist and able to earn a salary of thirty or thirty-five shillings a week as an outdoor assistant. In support of these statements reference is made to the advertisement columns of this Journal, and it must be admitted that to some extent there is a foundation for the complaint that the remuneration offered to chemists' assistants is very low. But that is the full extent to which it is possible to endorse the statements of "A Chemist's Assistant." The hardships which he mentions are altogether imaginary.

The necessity of serving an apprenticeship, if it could in any sense be regarded as a hardship, does not exist, and although it is necessary that every candidate for legal qualification as a chemist must produce satisfactory evidence of having been engaged for three years in the practical exercise of the business, that demand cannot be deemed a hardship, since it does not amount to anything more than a requirement that candidates should be practically conversant with the business they desire to be authorised to carry on. The necessity of having a good education is no more than the nature of a chemist's business involves, so that would be no hardship even if the demand were strictly enforced. Unfortunately that is done to a great extent only in theory, and is not insisted upon in practice to anything like the extent that it should be. This fact brings us to a real hardship that chemists' assistants have to endure, viz., the competition of imperfectly educated persons, who are willing to accept low salaries which would not properly remunerate a competent assistant. That is probably the most serious hardship to which chemists' assistants are exposed, and it is one which can be remedied only by establishing a system of compulsory education and training.

The examination of which "A Chemist's Assistant" speaks as having to be passed after apprenticeship is no test of having a good education. It is merely a schoolboy's examination, adapted for ascertaining that the candidate can make proper use of his native language, that he has a practical knowledge of the rules of arithmetic, and some acquaintance with Latin. Instead of being passed after apprenticeship is over, and when mature age is being approached, it should be passed before the apprenticeship becomes possible. If that rule were strictly enforced the real hardship, which has been mentioned above as affecting chemists' assistants, would be very materially reduced, and they might not only expect better remuneration, but also be expected to be better worth higher remuneration than they now often receive. The second examination, which is to be passed as a test of fitness to obtain the position of a fully qualified chemist, so far as the minimum requirements of public safety are concerned, is another source of hardship to chemists' assistants, as well as to chemists in business on their own account. That examination is insufficient to serve as a means of ascertaining that the candidates who present themselves have undergone such a course of scientific and technical education and training as would have enabled them to acquire that thorough competence which is essential for the practice of pharmacy, and as a basis for the protection of the material interests of those engaged in that occupation. Whatever hardships chemists' assistants have to endure at the present time may therefore be traced to the want of education, and to the inadequacy of the examination system to protect those who are well educated against the competition of inferior men.

### ANALYSTS' CERTIFICATES.

In the *Lancet* for last week reference is made to the objectionable practice, resorted to by certain public analysts, of adding irrelevant comments to the certificates furnished by them in cases under the Food and Drugs Act. The analyst in the particular case referred to had certified that a sample of milk in question contained less than the normal amount of fat, and stated that proper milk should contain not less than a certain percentage of fat, the presence of a less proportion being an indication of fraud. The magistrate's decision had been appealed against, and Mr. Justice Charles, whilst confirming the conviction, acquitted the appellant of having abstracted anything from the milk. He, further, stated "that he felt a good deal of injustice might be done by the insertion of unauthorised statements in the certificate." The *Lancet* remarks: "We need hardly express our satisfaction at these latter remarks of the learned judge, as surely the duty of an analyst is simply to determine the constituents of the samples submitted to him (generally, in cases like the above, the quantity of added water calculated from an arbitrary standard), to add if he thinks necessary a few observations explanatory of the analytical results, but there his duty ends. An analyst who ventures to state in his report or in the witness-box what does or does not constitute fraud undoubtedly exceeds his proper functions, and in no case more than in that of milk analysis, where, in order to be quite sure that analytical evidence determines adulteration, the results must be based on a somewhat elastic interpretation." These remarks are quite in harmony with the opinions that we have expressed from time to time, in referring to the growing abuse of their position by such public analysts as attempt to instigate prosecutions, whilst assuming a non-existent authority for purely arbitrary standards. What they lack in authority these individuals would like to replace by assertion, but fortunately both magistrates and judges are becoming aware of the obnoxious nature of the claims thus set up, and are dealing in a satisfactory manner with analysts' "unauthorised statements."

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### PERCENTAGE SOLUTIONS.

The question as to what constitutes percentage solutions has once more been raised by a correspondent, whose letter appears on page 420. This matter was considered at length on page 49 of last volume, and it should now suffice to say that in true percentage solutions the proportions of active ingredient and solvent can always be expressed in the same terms. These may be terms of weight or terms of volume, but both constituents of a given solution must be expressed alike, in one only of them. In the cases suggested by Mr. Turner the same rule would hold good as in the one he refers to, but it is obvious that the volume of the finished solution would differ in each instance. A fluid ounce of each solution would thus contain a different quantity of the active agent, as compared with either of the others, and this fact constitutes a serious drawback to the use of true percentage solutions in medical practice. It is, doubtless, partly to avoid error on this account that the compilers of the new U.S.P. decided to fall back on the old-established rule of "solids by weight, liquids by measure," in accordance with which the B.P. solutions are made. The current misuse of the term "percentage solution" in reference to certain of the latter is due to a fallacious rendering of the official "1 in 100" or "5 in 100," as one or five per cent. respectively. What is strictly meant by these and similar expressions is simply one or more parts by weight in so many parts by volume, and this is probably the safest rule to adopt with regard to medicinal preparations. The only real percentage solutions official in the B.P. are, we believe, the two solutions of ammonia. It may be well to point out here that the frequent repetition of questions on this subject, and the hazy notions too generally entertained regarding it, indicate a deplorable lack of knowledge of elementary arithmetic where such ignorance ought not to exist.

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### CHINA AND THE OPIUM TRADE.

The letter on this subject, which appeared in our last week's issue, raising issues of a controversial nature, has elicited a rejoinder from Mr. H. N. Lay, C.B., Chinese Secretary to the Earl of Elgin's Special Mission to China, and afterwards Inspector-General of Chinese Customs (see page 419). This gentleman may be regarded as an authority on the subject of which he writes, and has published a 'Note on the Opium Question' during the present year. In this he points out that opium was an article of import into China from Persia, Syria, and Turkey, at as remote a period as the eighth century, and that the cultivation of the opium poppy has been carried on in China since the latter part of the fifteenth century, whilst British official relations with that country did not begin until 1637. These facts speak for themselves, but it is also noteworthy that the majority of recent Consular Reports refer to the persistent and steady decline in the importation of Indian opium into China, the native-grown and Persian products tending to supplant it. We have no desire to discuss this matter in any controversial spirit, and have published extracts bearing upon it, from Consular Reports, purely in the way of information, but would point out that in view of the great medicinal value of opium and the prospect of supplying our markets, probably at no distant date, with the drug produced in British possessions, it appears extremely undesirable to allow any merely sentimental objections to hamper the growth of an important and beneficial industry.

### SIR ANDREW CLARK.

The numerous lengthy and sympathetic references to the death of Sir Andrew Clark, which have appeared in both the medical and lay press, afford eloquent testimony to the great esteem in which the late President of the Royal College of Physicians was universally held. He died on the 6th instant, and the funeral ceremony was conducted on Saturday last. In compliance with a memorial signed, amongst others, by the leading Fellows of the College and some of the most prominent members of the House of Commons, the first part of the ceremony was performed in Westminster Abbey. The pall-bearers included the Prime Minister, Sir Henry Acland, Sir James Paget, and the Presidents of the Royal College of Surgeons and the General Medical Council. The Royal Society was represented by Professor Michael Foster, the British Medical Association by Mr. Ernest Hart, and the Pharmaceutical Society by the President, Mr. Michael Carteighe; whilst the number of other distinguished representatives of the Universities, State departments, various institutions, and every class in society was exceedingly great, the attendance being compared in one report with that at the funeral of the late Poet Laureate. The interment took place subsequently at Essendon, Herts.

### ADULTERATION OF DRUGS.

In the twenty-second annual report of the Local Government Board, 1892–93, published last week, it is stated that "the extent of the disproportion between the number of samples of drugs reported against, and those in respect of which proceedings were successfully taken, suggests that the substantial adulteration of drugs may possibly be more rare than the percentage in the table would seem to indicate. Of the 141 samples condemned only 44 were the subject of prosecutions, and in just half of these cases fines were imposed." The official publication of these remarks, with the facts quoted, serves as a useful commentary upon the grossly exaggerated and irresponsible statements that are published from time to time by individuals interested in attacks upon chemists and druggists. The total number of samples examined during the year was 702, and many of these were doubtless purchased from others than registered chemists and druggists.

### NORTH BRITISH BRANCH.

At a meeting of the Executive of the North British Branch of the Pharmaceutical Society, on Thursday last, Messrs. J. I. Fraser and J. W. Sutherland were nominated for election as members of the Board of Examiners for Scotland. Messrs. P. Boa, D. B. Dott, Adam Gibson, Jas. Jack, Thos. Maben, and John Nesbit were renominated as examiners.

### COMMISSION OF THE PEACE.

We learn that Mr. W. Bastick, Pharmaceutical Chemist and Member of the Pharmaceutical Society, has been appointed a Justice of the Peace for the county of Buckingham.

### PHARMACISTS AS AUTHORS.

It is a somewhat rare occurrence to have to chronicle the publication of a book written by a pharmacist, particularly when the subject treated is out of the beaten track of scientific and technical matters more or less directly relating to pharmacy. Severely technical in a totally different direction, yet likely to constitute a valuable contribution to the literature of the subject of which it treats, is the work compiled by Mr. J. M. Furness, of Sheffield—Associate of the Pharmaceutical Society and Member of the local City Council—under the title of a "Record of Municipal Affairs in Sheffield, from the Incorporation of the Borough (now City) in 1843 to the Celebration of the Jubilee in 1893" (W. Townsend and Son, Sheffield). It is a handsome demy octavo volume of nearly six hundred pages, and relates generally to public life in Sheffield, besides containing a variety of information concerning the different public bodies. The preface is followed by portraits of the members of the City Council during the present year, then by complete lists of members since 1843, with analyses. Chronological notes of the chief items of Council business, and the more important local events during the same period, next receive attention; and, finally, general descriptive and statistical information of the various corporation departments is supplemented by large maps, indicating the municipal wards, parliamentary divisions, and streets, in 1843 and 1893 respectively. Mr. Furness, who will be remembered as a winner of certificates of merit in all subjects, at the Society's School of Pharmacy, in 1878, may be cordially congratulated on the successful outcome of his labours, which must have been both prolonged and tedious. Apart from the purely local interest the work is certain to excite, the volume should prove of special interest to all who take an intelligent interest in municipal affairs generally.

### ABRIDGMENTS OF SPECIFICATIONS.

Since the Patent Laws of this country make no provision for an official search as regards novelty, it follows that applicants take out Letters Patent at their own risk and, to ensure the priority of their claims, must necessarily make or cause to be made an independent search into the nature and extent of existing Letters Patent. To enable such searches to be conducted more expeditiously abridgments have recently been completed referring to all specifications for the period 1877-83. These, together with the abridgments in the Illustrated Official Journal from 1884 onwards, will supply a means for searching as to novelty as regards all existing patents, and should enable intending patentees to ascertain whether they are likely to infringe existing patent rights. A list of the abridgment classes may be obtained at the Patent Office, Chancery Lane, E.C. The abridgment class "Medicine, Surgery, and Dentistry" for 1877–83, just published, contains short illustrated descriptions of about six hundred and seventy inventions relating to medicines, to the various forms of surgical and dental instruments and appliances, and to the manufacture of artificial teeth, pills and potions, electropathic appliances, apparatus and materials for disinfecting, deodorising, and fumigating.

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting of this Association on Thursday, November 2, the chair was taken by the President, Mr. E. F. Harrison, and a paper on the subject "How shall we check unjust trade?" by Mr. C. E. Pickering, was read by the Literary Secretary, Mr. C. E. Sage. After discussing at length the manner in which the intentions of the Pharmacy Act were defeated by the formation of limited liability companies, which carried on business as chemists and druggists, the essayist concluded by moving the adoption of resolutions to the effect that the widows' clause of the Pharmacy Act should be rescinded, and the Society have power to remove from the Register the names of persons guilty of unprofessional conduct, including assistance to unregistered persons desiring to carry on the business of a chemist and druggist. Neither of these propositions found much support, an amendment to the second one, proposed by Mr. Gane, to the effect that the meeting was of opinion that the Pharmaceutical Society should form a code of ethics for pharmacists, and have power to remove from the Register the names of persons guilty of breaches of the code, being carried. At the close of the discussion, the President explained that the Association would be represented in the proposed federation of local associations.

At the meeting held on Thursday, November 9, the chair was taken by the President, Mr. E. F. Harrison, and, after the usual preliminary business, the following paper was read:—

### A NEW METHOD FOR THE DETECTION AND DETERMINATION OF OXALIC ACID.

BY ALEX. GUNN.

My laboratory duties necessitated my dealing with large quantities of pure solutions of iron salts, such as solutions of ferrous phosphate and of ferrous hypophosphite, which, when carefully made, are nearly water-white. The solutions are extremely delicate; undue exposure to the air and many other causes rapidly decomposes them, with formation of more or less colours. But one reaction in particular led me into no end of trouble. It was the production of a persistent lemon-yellow colour in an acid solution of ferrous phosphate. This led to a lengthy examination of all the materials which had been used, with the result that oxalic acid was found to be the disturbing agent. The apparent delicacy of the reaction and the stability of the colour were sufficient to lead me to try a number of experiments, and the results have been somewhat beyond my expectations. From the work I have done up to the present moment I am inclined to the belief that a pure unoxidised acid solution of phosphate is, under some circumstances, a means of detecting very small quantities of oxalic acid; and I am further of the belief that the colour of the reaction is a measurable one, and that small percentages of the acid can be determined with a fair amount of precision.

In a case of this kind I have naturally had innumerable difficulties to contend with, and although many of them have been overcome, I feel sure that there is some work to be done on the subject, and that it is well worthy of further study. A determination can be performed in a wonderfully short time when compared with the precipitation method. If reagents and apparatus are ready a result can be obtained within five minutes.

The chief reagents are:—1. A standard solution of oxalic acid, of which 100 C.c. = 1 Gramme. 2. A solution of ferrous phosphate containing about 12·5 per cent. $Fe_32PO_4$, with excess of phosphoric acid.

Apparatus required:—Nessler glasses; Burette, 20 C.c. in $\frac{1}{10}$ths, and with a fine outlet; Graduated Cylinder, 100 C.c.; Graduated Cylinder, 50 C.c.: Pippettes, 5 C.c.

It is of course necessary that the light should be good to commence with, and that the Nessler glasses in use should stand on a white tablet or sheet of paper. Now I shall proceed to describe the working of the process in the case of simple aqueous solutions of oxalic acid of unknown strength.

First of all run 7·5 C.c. of the solution of ferrous phosphate into a Nessler glass, and make up to the 50 C.c. mark with distilled water. This solution should be perfectly water-white. The success of the determination depends almost wholly upon this condition. Then make 50 C.c. more and place in another Nessler glass. Into one of the glasses drop a few C.c. of the solution to be determined, and stir well. A yellow tint will be developed at once if oxalic acid is present. Taking note of the amount used, the colour is imitated in the other glass by dropping the standard solution from the burette into it until, after stirring, the proper shade is reached. The calculations are simple, and, as will be readily seen, the operation does not occupy more than a few minutes. So far the process is satisfactory. Proceeding in the way I have described, a few determinations of weak aqueous solutions of oxalic acid were undertaken.

*1st Solution.*—10 C.c. of the solution of unknown strength required 9 C.c. of the standard solution to produce a similar tint. 9 C.c. standard solution = ·09 Gramme oxalic acid, therefore 10 C.c. of the solution examined contains ·09 Gramme oxalic acid, = 0·90 per cent. found; actually 0·92 per cent. was present.

*2nd Solution.*—5 C.c. used; required 3·4 C.c. of the standard solution, = 0·68 per cent. found; actually 0·72 per cent. was present

I have a foot-note here saying that the light was bad for matching the colours.

After these satisfactory results I proceeded to apply more crucial tests to the process, and on looking up the literature of the subject I found the following statements, by Warington, in his paper entitled "Notes on the Chemistry of Tartaric and Citric Acids," published in the *Journal of the Chemical Society*, 1875, pp. 989 and 990.

Speaking of the presence of oxalic acid in tartaric acid liquors, he says, "Oxalic acid is of frequent occurrence in old liquors; it is usually recognised by its appearance in the form of crystals. It is not easy to detect oxalic acid in the liquor by any qualitative test, even when it is known to be present: of the difficulties involved anyone may convince himself by dissolving oxalic acid in a solution of tartaric acid containing alum, and then trying to detect the oxalic acid added."

In a mixture of the following composition—

| | |
|---|---|
| Acid tartaric .................. | 50·00 Grammes. |
| Alum ......... ............ ...... | 15·00 „ |
| Acid oxalic ..................... | 0·75 „ |

and working with 5 Grammes of the mixture, the characteristic yellow colour was unmistakably shown, but not quantitatively. Several other mixtures were tried, but with no greater success with regard to quantitative work. It appears then from the experiments I have conducted on these lines that when alum is present to the extent of 20 or 25 per cent. the results are vitiated, although qualitatively the presence of oxalic acid is clearly seen when 0·75 per cent. or even much less is present in the mixture. Tartaric acid, however, containing about 1 per cent. oxalic acid and the same amount of alum comes out nearly accurate quantitatively. These mixtures I may say were used without any treatment whatever, beyond dissolving them in about 50 C.c. water and using an aliquot part of the solution. On experimenting further I tried neutralising the solutions. Results were at once better. Using ammonia, aluminium hydrate is not thrown down in the presence of the tartrate, so that the neutral point can be reached and exceeded without any precipitate coming in the way; a slight excess of ammonia is allowable, provided it is not in sufficient amount to destroy the acidity remaining in the acid solution of ferrous phosphate. The following result was obtained in the case of a mixture of alum, tartaric acid, and oxalic acid without neutralising. Using 5 Grammes I obtained 0·52 per cent. oxalic acid; the actual percentage being 0·60. As the percentage of alum rose in other experiments, the oxalic acid indicated diminished, showing that the presence of much alum in acid solution upsets the working of the process. Another experiment of interest was one in which oxalic acid was present in the small proportion of 0·05 per cent. With 2·5 Grammes of such a mixture the yellow tint indicating oxalic acid was quite perceptible.

In the absence of alum, that is, in mixtures of tartaric acid and oxalic acid, the latter can be estimated with something like precision. Take the following figures:—

I. 5 Grammes of a mixture of tartaric acid and oxalic acid dissolved in 20 C.c. water, 10 C.c. used for determination, required 4·4 C.c. of the standard oxalic acid solution = 1·76 per cent. found. Actually 1·70 per cent. was present.

II. 5 Grammes dissolved in 20 C.c. water, 10 C.c. used, required 4·5 C.c. of standard oxalic solution = 1·80 per cent. found. Actually 1·80 per cent. was present.

III. 5 Grammes dissolved in 20 C.c. water, 10 C.c. used, required 4·7 C.c. of standard oxalic solution = 1·88 per cent. found. Actually 1·90 per cent. was present.

IV. A mixture of tartaric acid and oxalic acid weighing 8·04 Grammes was dissolved in distilled water and made to measure 20 C.c., 10 C.c. used for determination, required 2·00 C.c. = 0·496 per cent. found. Actually 0·497 per cent. was present.

Other solutions of tartaric and oxalic acids, neutralised, were tried, but there seemed to be no advantage in neutralising, as the results obtained were practically the same as in acid solutions. This points to free tartaric acid having no destructive effect on the reaction.

With a desire to try the process on the old tartaric liquors, I wrote to Mr. Warington, the author of the paper I have referred to. That gentleman at once acceded to my request by sending me two samples of the liquor, and I take this opportunity of thanking him for his kindness. When I first saw the samples I immediately came to the conclusion that my process would be useless for the work, because of their dark brown colour, but a few rough experiments encouraged me, inasmuch as oxalic acid was indicated in considerable amount. Several preparations were accordingly made in order to see if oxalic acid could be detected. The liquors were labelled A and B. About 10 Grammes of each liquor was dissolved in water, made up to 100 C.c., and then filtered. These solutions were of a brownish yellow tint, which would have interfered with the comparison of the colours for estimation. They can be decolorised to a certain extent with animal charcoal, but a yellow tint remains after treatment with the charcoal, which is precisely the same as that of the iron-oxalic reaction. I attribute this to the iron which was found in the liquors reacting with the oxalic acid also present. This initial colour would therefore be allowed to enter into estimations. It is necessary to treat with charcoal, as it prevents any confusion in the colours. Less than two days will suffice to take up the brownish tint, which is evidently due to combustion of the tartaric acid.

To detect oxalic acid, 5 C.c. of each solution was dropped into Nessler glasses containing 7·5 C.c. of the ferrous phosphate solution in 50 C.c. water. The characteristic yellow colour was produced in every case, and in a degree denoting the presence of a considerable percentage of oxalic acid.

I have not recently tried, by any of the ordinary methods, to detect oxalic acid in the mixture suggested by Warington. When such an authority as he says that it is difficult, we may rest assured that it is so.

With regard to the tint or depth of colour for quantitative work, I think that produced in the 50 C.c. ferrous phosphate solution by 4 or 5 C.c., standard oxalic solution (100 C.c. = 1 Gramme), is very suitable to work by when the mixtures under examination contain a fair percentage of oxalic acid. But obviously, when mixtures contain only small traces of oxalates, the manipulation must be varied accordingly.

The colour of the reaction is destroyed by the strong mineral acids. But experiments have been tried in which the solution of ferrous phosphate was diluted to the 50 C.c. with dilute phosphoric acid of specific gravity 1·080. The reaction was exactly the same as if water only had been used.

Temperature does not seem to affect the colour. Solution of ferrous sulphate was tried instead of ferrous phosphate, but although the same coloration was observed as with the phosphate, the latter appeared to react much more sharply than the former.

I have, so far, met with only one substance which produced a tint at all resembling the oxalate colour, and that is antipyrine, but a comparison of the two will show the difference at once. Absolute accuracy is not claimed for the process, but I have no hesitation in saying that in point of delicacy it is not behind the precipitation method, and that it may be used in some instances where the latter cannot be relied upon or would be too tedious to carry out, as, for example, in the case of the tartaric liquors.

I am well aware that even in the event of this process proving successful its sphere of usefulness would not be a very large one, but since it detects and possibly determines the amount of oxalic acid in these old tartaric liquors, it is my opinion that the existence of the process is justified on that ground alone.

Many of the experiments I have already completed would be rather out of place in the present paper, and as I am carrying on other experiments on the tartaric liquors I hope to accumulate enough matter to form the subject of another paper.

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Mr. Gunn performed several experiments and showed the colours produced by minute traces of oxalic acid in ferrous phosphate solution.

The President was pleased Mr. Gunn had brought the paper before the Association, and said that the proper thing for all members to do was to note out-of-the-way reactions or incidents in their work, and then follow them up and bring the matter before the Association. The test seemed a very useful one, and for those who had to examine tartaric acid liquors, it would be convenient. He should like to ask Mr. Gunn whether he had taken any means to confirm the presence of iron in the liquor alluded to, and had he tried negative tests with other substances, in order to ascertain whether anything else gave a similar colour.

Mr. Symons asked if Mr. Gunn had examined any of the tartaric acid of commerce, for most probably if oxalic acid was present to such an extent in the liquors, it would be found in the commoner varieties of acid. Had Mr. Gunn ascertained the presence of oxalic acid by any other method in the liquors, and was he aware of the solubility of calcium oxalate in acetic acid?

Mr. Sage asked if any of the nearly allied acids had been tried to see if they gave the same results. Had malic or racemic acid been used; he had noticed a yellow coloration when quinine and ferrous phosphate solution were mixed. Would not Mr. Gunn find it more accurate to use a salt of oxalic acid, either the potassium or ammonia one, to make a standard solution with. He thought the reason alum interfered with the reaction was that sulphuric acid was liberated, and this destroyed the colour. Was Mr. Gunn's statement correct that solutions of ferrous phosphate and ferrous hypophosphite were water-white.

Mr. Gane congratulated Mr. Gunn upon the valuable results he had obtained, and observed that the coloration was a familiar one to photographers in using the iron-oxalate developer. The tendency to determine substances by colorimetric methods was increasing, and was detrimental to the use of gravimetric methods, but these latter had been used for so long, and had been found reliable, that they could hardly be superseded by them.

Mr. Gunn, in replying, said that the colour was the same as produced in the photographic developer. He had tried a very large number of substances to see if they reacted with ferrous phosphate in a similar way to oxalic acid, but found none that did, except antipyrine, and this differed by producing a reddish tinge. The alum did vitiate the result by reason of the sulphuric acid liberated. Solutions of ferrous phosphate and hypophosphite were almost colourless, but were tinged green. In reply to Mr. Symons' reference to the solubility of calcium oxalate in acetic acid, he (Mr. Gunn) had made several experiments with it, and found that a mixture of glacial acetic acid and calcium oxalate would give the colour indicative of oxalic acid when it was treated with ferrous phosphate. He had proved the presence of iron in the tartaric liquor, and the small amount of iron present was what reacted with the oxalic acid, and gave the yellow colour which he was unable to remove by treatment with animal charcoal.

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The President then mentioned that a member had another subject to bring before the meeting, and Mr. Davies rose to make the following proposition:—"That the Council of this Association discuss the idea of planning excursions into the country on Sunday, and adopt the best method of carrying it out." Mr. Davies was of the opinion that there was not enough friendship and social intercourse among chemists' assistants, and as they were mostly tied to business during the week, that this would be the best manner in which to improve their acquaintance with each other. He thought it a matter to be dealt with at once.

The President said he knew that, with many men who had no friends in London, Sunday was a dreary day, and he should like to see the matter thoroughly discussed, for if anything were done it should be done soon, and then if it were a success it could be carried on through the summer.

Mr. Gane seconded the proposition as Mr. Davies had put it, and thought the plan a very desirable one, and likely to be of benefit to all members. He mentioned the success of the Saturday afternoon excursions of the School of Pharmacy Students' Association, and hoped that something would be done to carry the proposition into effect.

Messrs. Tickle, Barratt, Morley, Jones, Hill, and Roe added their warm support to the expressions of the previous speakers' opinions, and the President then put the resolution to the meeting, with the result that it was carried unanimously.

# Provincial Transactions.

## MANCHESTER PHARMACEUTICAL ASSOCIATION.

The first ordinary meeting of this Association was held on Wednesday evening, November 8th. Mr. George S. Woolley, President, occupied the chair, and there was a fair muster of members. After a number of new members had been elected, the President called upon Mr. Harry Kemp to open a discussion on "The Federation of Local Pharmaceutical Associations."

Mr. Kemp, having first read the letter which had been received by the President from the interim Committee of the Federation, said: Mr. President and gentlemen, I am glad to have this early opportunity afforded me of bringing before you and eliciting your various opinions upon the question of federation, as briefly outlined in the circular which I have just read, and to which your attention had previously been directed by the kindness of the editors of the trade journals. You will all recollect the very successful meeting we held in March last, when over two hundred chemists of the district met to consider the question of trade organisation. These two hundred chemists represented a very great many more who would have been present but were prevented by the ties of business. The fact that so many chemists assembled at that meeting demonstrated unmistakably that a very large percentage of the trade are keenly alive to the need for more organisation, and that in more organisation they see more hope for the future. I am not going to say that that meeting was an unqualified success—no such thing—but it was a success none the less. As a more or less direct result of that meeting—as a consequence of causing some men to think—we added a goodly number of members to this Association, were instrumental in resuscitating a defunct one in another town, besides adding to the Pharmaceutical Society of Great Britain a fair number of new subscribers, as well as bringing back some old ones. More than that, we had as a direct outcome of that meeting the pleasure of nominating and the satisfaction of successfully promoting the election of our friend, Mr. Rymer Young, to the Pharmaceutical Council. I will return to this later. Nothing is easier to some men than to criticise, and there are such who have said that these meetings do no permanent good; that they are like religious revivals, productive of much excitement, which gradually subsides, dies out altogether, and leaves things much as they were before. There may be some truth in this, but I think you will all admit that some converts are made in religious revivals, and that among the number are some who become earnest, energetic workers. So be it with us. Let me add, that if that meeting had to be recorded as a "flash in the pan" simply, the blame would rest with those who never by so much as a single word tried to prevent it becoming so. I may, however, assure you once and for all that that meeting was not a mere firework, dazzling by its brilliance and leaving the darkness deeper than before. On the contrary, whilst it was in no sense of the word brilliant, its influence has not died out, and will not.

Now, gentlemen, this question of organisation has entered into other minds than ours, and simultaneously with ourselves, friends in Birmingham and elsewhere have thought it was time a move was made to bring about a closer union between the scattered fragments, and by welding them into one homogeneous whole, hoped it would be possible to exert an influence for the common good such as does not at present exist and acquire a power such as appears impracticable of attainment by any other means. Prompted by this hope, a meeting of local secretaries and others was called at Nottingham during the British Pharmaceutical Conference meeting to test the feeling of the trade upon the matter. That meeting, which was free and open to all, included representative men from all parts of the country, and embraced all grades of pharmacists. It was perfectly unanimous in affirming that there was scope for and need of an organisation which should bring all lesser pharmaceutical organisations into close touch, and, if need be, into simultaneous action, and "The Federation of Local Pharmaceutical Associations" was the outcome.

The promoters had no definite plans or schemes to bring forward for adoption by the meeting; they did not call the meeting that they might have an opportunity of parading their own hobbies; they did not wish to place any restraint upon discussion; but they wished to hear a full and free expression of the evils under which the speakers chafed, and of the means suggested for their remedy. As far as it went, that meeting was undoubtedly a success, and the promoters had the satisfaction of having their own opinions confirmed, of finding that their own feelings met with responsive echoes in the words of others. The pharmacists at that meeting felt that there were things requiring doing that they believed were capable of being done, and they decided that the time and place were opportune for making a beginning, and that the ways and means might be advantageously left for discussion at a future time by representatives to be chosen by local associations. An interim Committee was appointed to communicate with the different associations; hence the circular which our President has received.

Inasmuch as my name appeared among those of the promoters of the preliminary meeting, and was included in the interim Committee, you will naturally expect me to say something about the objects which the promoters of this new scheme have in view, and with your kind forbearance I will endeavour to do so. It will be an advantage, perhaps, if I treat the question first from a negative point, and indicate what are not the objects of the Federation. First and foremost it is not proposed to run counter to the Pharmaceutical Society. Secondly, there is no wish to take up the legal work of the defunct Trade Association in prosecuting or defending prosecutions under the Medical Acts or the Food and Drugs Act. Thirdly (and to my mind this is an important point), it is not proposed to run a "Mutual Admiration Society," in which each man expects to receive his full complement of plaudits and a full acquiescence in all he says.

Now, as to its positive side. We are firmly of opinion that there are many things at present detrimentally affecting the trade which could be more or less effectually dealt with if united action on the part of a majority of those engaged in the trade could be assured. Such unity has seemed up to the present unattainable, but we are sanguine enough to believe that this Federation will supply the medium of unity. We desire that each local society and every community of chemists should have representation on an executive body, that matters affecting our trade interests should be discussed by these communities, and be afterwards deliberated upon by the whole body as represented by the delegates, and that if after fuller discussion suggested remedies for existing evils are thought practicable, means shall be adopted for using the powers already existing to test the efficacy of those remedies, and if found lacking, then to devise others. One journalist has suggested that the best services which could be rendered by the Federation would be to ensure the fair discussion of all sides of a question. This is precisely what we desire to see—it is indeed just what we are striving for, being satisfied that if light and air were brought to bear upon some of the questions affecting our calling by the ventilating process of discussion, much of the present callous indifference to our best interests would disappear. It is suggested that this Association and others shall send delegates; that those delegates shall appoint officers, draw up rules and bye-laws, and put the scheme at once upon practical lines and on a broad and satisfactory basis. By making it co-extensive with the area of the Pharmaceutical Society's jurisdiction, and holding its annual meetings at movable centres, it would be free from suspicion on the ground of local or individual influence. Being representative of all localities, and of the great bulk of individual chemists, its influence would be far-reaching and its deliberations respected.

I have said that we are not antagonistic to the Pharmaceutical Society. Three of the four comprising the present interim Committee are local secretaries of that body—one of them being also Vice-President of the Society—and they may be trusted for their loyalty to its constitution. At the same time, we have a perfect right, as individuals, to use such eloquence as we possess, and such power as we can exert, for the advancement of the interests of the trade at large, even when they might appear to be opposed to the policy of any member of the Council of the Society. We are not called upon to sacrifice our own principles, to endorse what every individual member of that Council may say, and, speaking for myself, I claim my right to oppose the return of any man whose presence on the Council I think detrimental to the common good, and I say that the nomination of good men and the promotion of their election would be in itself a sufficient reason for the existence of the Federation, and supplies at once an answer to the question, "What can be done by the Federation that cannot already be done as well or better by the Society?" The Council cannot discuss, much less influence its own election. The Federation could very materially influence the elections, and if it did I do not hesitate to say we should see less of "the round man in the square hole." We must have more men of mettle—it is not heads simply that we want, but brains; as a friend said to me, "We want live men in every office," and men who, whilst taking the honours, will also share the labours of the day. I said I would refer again to Mr. Young's election. I do so now because it furnishes an instance of what may be done by organisation of even a feeble form. I believe the trade have in Mr. Young a thoroughly honest representative, and it should be our aim to find out good men in whom the capacity to think and the capacity to work are suitably combined, and this Federation will be the very means for discovering them.

There are some devoted men on that Council whose sympathies are fully awake, and whose services we could ill afford to lose—men whose record is one of untiring zeal. We want more of them. The labours of the Council entail a great amount of self-sacrifice, and men who have not time to attend to the duties should not undertake them—the intelligent elector wants something more in return for his vote than merely signing the attendance book and drawing the fees. If by means of the Federation we succeed in awakening a more healthy activity among the electorate, we may safely look for a corresponding improvement in the elected.

Although this Federation will be in no way dependent upon or responsible to the Pharmaceutical Society, it may be a useful handmaid, and I believe there are many ways in which material support and much persuasive influence might be legitimately brought to bear upon the Society. Take for example the one-man company trader, of which Birmingham supplied so excellent a specimen, whose business transactions were described as "a travesty of the Companies Act." Cases on precisely parallel lines with this swarm, but I believe if the Federation took this matter up in a business-like manner, and the Society saw that it had the support of the great bulk of the legitimate chemists, the days of many of those companies would be numbered. Another point — the Privy Council, in its wisdom, has not consented to the increased severity of the examinations, in order that a man may be better fitted to sell or dispense poisons, but to more effectually protect the public health. The candidate is not examined in the depths of botany, chemistry, pharmacy, and the recognition of drugs for fun, but solely with a view to assuring, as far as possible, that the drugs supplied to the public shall be personally guaranteed and efficiently compounded. At present, the public have no such guarantee, because the law permits confusion to exist, instead of compelling a distinction to be clearly drawn between the man who has satisfied the examiners of his competency, and the huckster who may be, and often is, utterly ignorant of the very simplest distinctions between one drug and another. This is one among the many matters which might be very profitably dealt with in a conference of this kind, and though the good results might not be immediately forthcoming, sooner or later the Legislature, if educated to it, will, in the public interest, demand the reform, and then our successors, if not ourselves, will share in the benefits and reap the reward to which their education, their training, and their subsequent responsibilities justly entitle them.

This is not a question of "protection for a class," which modern politicians are opposed to, but a question of the public good, "the protection of the public health," which is one of the first principles of modern law. As I have emphasised the fact on previous occasions, it is scarcely necessary for me to repeat here that the Pharmaceutical Society is the only channel through which these benefits can be brought about, and the organisation which should have the moral and substantial support of every member of the trade; but I repeat it here for the purpose of still further emphasising it, and of emphasising the additional fact that the promoters of this Federation desire most of all to render effectual aid in enforcing the powers the Society at present possesses, and of helping to bring about a considerable extension of those powers.

Perhaps I may anticipate two questions that will arise in discussing this business. First, the question of means. Personally, I am in favour of a capitation levy upon the funds of the associations, and if in sparsely populated districts an association could be made to include a fairly large area, we might soon have every district and nearly every chemist in the country represented. The second question is the distribution of representation. I think every association of twenty to fifty members should send one delegate, and associations with more than fifty members one delegate for every fifty or fraction of fifty. In cases of associations of less than twenty members I would suggest amalgamation with a neighbouring association and the appointment of one delegate for the amalgamated two. I wish you distinctly to understand that I hold no brief from the interim Committee. Apart from the mere roughly-outlined principles which form the basis of the scheme, I am solely responsible for the views I have laid before you to-night. They are my own, and deserving of support only so far as they are in accord with the dictates of common sense. Whether they are illusionary and utopian, or whether their realisation is within the limits of practical politics, I leave to others to say, but I trust you are agreed: (1) that the aims are commendable; (2) that the scheme is practicable; and (3) that you will combine with other associations in making this Federation of local associations a living reality and a power for good to the great body of pharmacists.

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The President said that Mr. Kemp deserved the thanks of the members for the able way in which he had brought this matter before them. He thought that this proposed federation would be able to assist the Pharmaceutical Society in many ways. With regard to influencing the Council election members should recollect that the Pharmaceutical Society was nothing more or less than the members of the trade themselves made it; he had no reason to disagree with the action of the Society. There was no doubt that a federation of this kind would have a tremendous power in their hands, which might be exerted either for good or for evil.

Mr. Kemp then moved:—"That the Manchester Pharmaceutical Association approves of the aims and schemes of the proposed federation of local pharmaceutical associations, as stated in the circular letter received by the President."

Mr. W. Wilkinson, in seconding the resolution, expressed his opinion that the proposed federation would be a very powerful engine for good. Unity meant strength, and the want of unity had always been the great curse of their business.

Mr. Charles Turner believed that this federation was very desirable. Many chemists he knew had a certain amount of antipathy to the Pharmaceutical Society, and would support a federation on the lines mentioned. Such a federation might, so to speak, touch the elbow of the Pharmaceutical Society on certain occasions. He believed the Pharmaceutical Society really had the interest of the trade in view, but generally the chemists did not always agree with what they did and thought. Such a federation might be the means of moving the Society, and he with pleasure supported the resolution.

Mr. J. Rymer Young, Member of Council of the Pharmaceutical Society, was of opinion that it would be quite safe, on general grounds, to support this resolution. Anything which had for its object the promotion of unity and tended to encourage the present system of utter disunion, as at present existed in the trade, deserved to be supported. It had been shown by their friend Mr. Kemp that this proposed federation could exert an influence on the Pharmaceutical Society, and he could see that it might exert a very healthful influence. As to the Council of the Pharmaceutical Society, it might be made more representative of the trade at large, but so long as the 15,000 chemists of the country elected to stand outside the Society and contented themselves with railing at everything that was being done, so long would the present Council remain as it was.

Mr. Kirkby wished Mr. Kemp had told them something more concerning what this proposed federation would do. He had mentioned that it would take in hand the nomination and elections to the Council of the Pharmaceutical Society. If this federation was to be of any practical use, it must have definite aims before it. It was not sufficient to say that it would not do any harm; they desired it to do good, and more good than merely to influence the election of councillors. At the outset, he failed to see where the powers of this proposed federation were to come from. Mr. Kemp had said that its powers would rest in its large membership, and that it would be able to treat with the Pharmaceutical Society and effect certain reforms which they might think desirable. That was a very roundabout way to get at the Society. One way in which such a federation might be useful would be in influencing Members of Parliament. Unless there was something more to come out of it than the nomination and election of members to the Council, he saw no necessity for the existence of a federation. He suggested that they should try and make better use of the organisation they already had; this would be a step in the right direction. As an amendment to the resolution before the meeting he proposed that, "In the opinion of this meeting it is desirable, instead of forming the proposed federation, to make better use of the present organisation."

Mr. Blackburn, in seconding the amendment, thought their energies would be best devoted to helping the Pharmaceutical Society. They had seen during the last year or two that the Pharmaceutical Society had wakened up very considerably, and chemists generally were now far more willing to support it than they were a short time ago. Looking at all the circumstances he considered they would be doing better in supporting the Society than in starting any new organisation.

Mr. W. Lane supported Mr. Kemp's resolution, as he could not see that the proposed federation would be in any way antagonistic to the Pharmaceutical Society; in fact, it would undoubtedly be a great support to it.

Mr. Kemp having replied to the objections, the resolution and amendment were put to the meeting.

The resolution being carried by a large majority, the President proposed the appointment of Mr. Kemp as the delegate of the Manchester Association to the Federation. This was seconded by Mr. Kirkby and carried unanimously.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The first ordinary monthly meeting of the session was held in the Society's Rooms on Wednesday evening, November 8, the President, Mr. G. T. W. Newsholme, in the chair. Before commencing the ordinary business, the President stated that Mr. Walter Hills had presented to the Society a bust of the late Jacob Bell. In acknowledging the gift, the President referred to the work done by Bell in the interests of the chemists and druggists; how he had given his time, money, and best energies to better the position of this class, a fact he feared was lost sight of in the present day, when so many held aloof from the Pharmaceutical Society. He trusted that when they looked upon that bust they would be reminded that all owed a duty to others as well as to themselves. The following paper was then read:—

### PHARMACEUTICAL MICROSCOPY.

BY JOHN AUSTEN.

It is my intention this evening to enumerate some of the many uses to which a pharmacist may place his microscope, and that with considerable advantage to himself. In the first instance, as a pharmaceutical student, he becomes acquainted with the microscope when pursuing the study of botany. In the first stages of this science a simple microscope or lens will be found adequate for all his requirements, and will enable him to clearly distinguish any external characteristics of the plant otherwise indistinct to the unaided eye. When, however, the interior of the plant is reached, and we wish to become intimately acquainted with its structure and workings, its cells and tissues, and the thousand and one other minute structures which go to make up the plant, then it is that a good compound microscope must be brought into play. In fact, we thus see that without the microscope the science of botany would be reduced to a mere list of plant names, and the all-important anatomy, histology, physiology and scientific classification of the plant would be unknown. My advice to the students here to-night is to study botany with diligence and perseverance, so as to obtain a complete mastery of its principles, for upon those principles is built the foundation of the knowledge of vegetable drugs. And yet after this we sometimes hear the question raised, "Of what practical use is botany to the pharmacist?"

I maintain, and I am sure that every one present will agree with me, that the pharmacist of to-day should be able to ascertain the purity of the preparations and chemicals sold by him; he also should possess a thorough knowledge of the quality of the crude vegetable drugs which he puts into stock. But very many of these drugs must be sold and dispensed in powder form, and although no doubt it would be much more satisfactory if the pharmacist would powder his own drugs, yet, where is there a pharmacy containing the necessary apparatus for so doing? Therefore, in most cases the retail chemist is obliged to obtain his powdered drugs from the wholesale houses. The consequence is, that unless he is prepared to examine such powders chemically and microscopically he cannot give a personal guarantee of their purity. At the present time the important subject of microscopical pharmacognosy is in its infancy. It is a most inviting field of enquiry, and one in which much valuable work has yet to be done, especially in that part of it which deals with the microscopical appearances of powdered drugs. In order to detect adulterations and admixtures in any particular instance, the pharmacist must of course be familiar with the anatomy of the pure drug itself, and also the appearance which it presents when reduced to fine powder. There are very few drugs which lose their identity, no matter to what state of division they have been subjected. The individual cells, glands, stomata, hairs, etc., often remain unbroken, and with patience and practice an adulterated powder may be readily detected.

I have several specimens of adulterated powders on the table. In the sample of rhubarb you will detect the smooth elongated cells of turmeric. Fænugreek and several others contain added starch, and some show a coniferous structure pointing to ordinary deal sawdust. Powdered leaves are often adulterated with exhausted senna leaves, ginger with exhausted ginger, and so on.

It is very surprising to note what a large variety of powders are now adulterated with starch. This is a very serious matter, and should demand the attention of every pharmacist; and seeing the comparative ease with which starch is detected, it seems all the more surprising that this form of adulteration is allowed to continue.

Not many weeks ago a chemist of my acquaintance had a complaint raised by one of his customers to the effect that some slippery elm powder, which the chemist had supplied, contained a large proportion of added starch. I may note that the customer was a microscopist, and had discovered the fraud by means of his microscope. Be this as it may, it was none the less galling to be told by an outsider that the drug was adulterated. To say that the powder was in the same condition when it was received from the wholesale house would not simplify matters in the least. Mustard, pepper, acacia, fænugreek and many other powdered seeds frequently contain a large percentage of added starch. Fine sawdust is sometimes found in cayenne pepper and powdered barks. Floor sweepings and sand are put into lupulin. Brickdust and bole are not uncommon in kamala.

Saffron is a drug open to all kinds of sophistications, on account of its high price. I have sometimes noted a reddish-coloured sand adhering to the stigmas, but oftener the stamens and petal shreds of various flowers have been detected. Adulterations like the foregoing can best be detected by applying the microscrope.

In the laboratory the pharmacist could not very well get along without his microscope. The simple lens will be found serviceable in detecting gritty particles in various ointments, especially those intended for a delicate organism like the eye. A small portion of the ointment should be pressed between two cover glasses and viewed in the ordinary way.

Preparations containing metallic mercury should show no globules of the metal when viewed under a magnifying power of ten diameters.

Pill masses and compound powders are also important items to be considered. It is indeed of the utmost importance that the ingredients forming these preparations should be intimately mixed together, and the microscope should be applied as a test of this.

We find very few references to the microscope in the British Pharmacopœia. It is found mentioned under such articles as starch and yeast. But if it has been found necessary to give an elaborate microscopical description of the various starches, how much more important it is to have reliable details of the microscopical structure of our more important roots, barks, and leaves.

Especially this should be so now that the microscopical structure of vegetable drugs is included in the subjects for the Major examination.

And now a word as to the pests which chemists have to contend with. They come chiefly in the form of bacteria, moulds, mites, and many kinds of insects.

I think every pharmacist should know something about bacteria, for they play such a very important part in the world's history. Bacteriologists tell us that if it were not for these minute organisms all vegetable and animal life would soon be at an end.

Bacteria may be found almost everywhere. In a normal state they exist in the blood, stomach, kidneys, and intestines, and it has been found that the digestion of food stuffs in the human subject is largely brought about by the activity of these micro-organisms. Bacteria play sad havoc with some of our preparations. They cause infusions and decoctions to go sour and muddy, syrups to ferment, and ointments to become rancid; in fact, all organic decomposition is attributed more or less to their action.

Moulds of various kinds are always with us. Preparations liable to become mouldy should be examined from time to time under the microscope, and if any mycelia be found, suitable preservatives should be added. Mites and insects are very troublesome, and they are the cause of much loss to the pharmacist. Almost all raw drugs are liable to be attacked, and some particularly so. Mites, similar to those found in cheese, attack cantharides, and in a surprisingly short time render them absolutely worthless.

Ergot, seeds and farinaceous drugs are often infested with these mites, and it is no easy matter to keep clear of them. In many cases the drug may be exposed to a temperature which will destroy the mites and the eggs, or a small lump of naphthalin or camphor kept in the bottle containing the drug will generally be found effectual in preventing these pests.

Here is a sample of pearl barley from our museum; it is infested with the mite and two or three distinct species of beetle. Together they have entirely destroyed its identity, every single grain of it being cleverly scooped out, and the whole reduced to a blackish honeycombed mass.

Many other cases could be mentioned, but this one is sufficient to show how important it is to watch our stock, examining it from time to time lest these microscopic enemies get the mastery of us.

Many other uses are found for the pharmacist's microscope, but we cannot dwell on these to-night. In these days the pharmacist is often called upon to examine water, urine, sputum, etc., and for such work a good compound microscope is absolutely essential.

I would strongly recommend all young students to become early acquainted with the microscope. Carry a simple lens in your pocket, and use it whenever an opportunity presents itself. I can see before me several pharmacists who long since adopted this excellent plan, and they will never have cause to regret so doing.

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Mr. Ibbitt moved, and Mr. Morrison seconded, a vote of thanks to Mr. Austen, and it was unanimously accorded.

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## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

A meeting was held on the 2nd inst. in the chemical lecture room of Caius College, when Mr. M. M. Pattison-Muir, Prælector in Chemistry of the College, gave a very interesting lecture on "Scientific Method," with experiments. There was a good attendance of members.

The lecturer said he intended to use some of the things which his audience were accustomed to handle in the routine of their business, to illustrate the method whereby science advanced and accurate knowledge grew from more to more. Science is accurate and systematised knowledge; strings of facts, however useful they may be, are not science; when comparison of fact with fact begins science begins. Observation, experiment, comparison of results of observation and experiment; framing hypotheses or guesses to account for those results of observation that are alike; testing these guesses by deducing consequences from them, and observing—or experimenting—to find whether the necessary consequences are or are not true; advancing from one hypothesis to another, with constant testing by observation and experiment; and, finally, embracing all the hypotheses and all the facts in a general theory—this, said the lecturer, is the scientific method. This method was illustrated by experiments on air, which were designed to answer the question—suggested by a comparison of air with other common things—is air a mixture or a compound of its constituents? The lecturer pointed out the great importance of classification in science in order to compare the results of observation and experiment with the view of reasoning thereon. It is necessary, said the lecturer, to put together those things that are like and to separate those that are unlike. The greater part of the lecture was then directed to the subject of classification. Taking magnesia alba, chalk, and cream of tartar, the lecturer traced, by the help of experiments, the resemblances and differences between the composition and properties of these substances. He warned the audience against drawing too hasty conclusions from experimental results, illustrating this by a few experiments which were performed by the alchemists, and interpreted by them to mean that metals are changeable one into another. The lecturer indicated briefly some of the ways in which drugs may be classified, but said that his object was not to classify these things, but only to use some of them as illustrations of the scientific method of classifying. As an example of the successful brushing aside of the unessential parts of a natural phenomenon, and so getting at the real essence of it, the lecturer described Sir Humphrey Davy's investigations on the composition of water. The lecture concluded with an appeal to the audience to recognise the vast importance to mankind of the advance of accurate, well-grounded, and systematic knowledge.

A very hearty vote of thanks, moved and seconded by Messrs. Alderman Deck and E. S. Peck, was awarded to Mr. Pattison-Muir for his lecture, and also for allowing them the use of the lecture room.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

This Society held a smoking concert in the Falcon Restaurant, on Tuesday, the 7th inst., Mr. Frank Walker, President, in the chair. Between forty and fifty members and friends were present, and a very pleasant evening was spent. During an interval in the programme the Chairman briefly recounted the objects and aims of the Society. He urged the members to attend regularly and do their utmost to bring new members into the Society. He specially emphasised the value of miscellaneous communications, such as dispensing problems, etc., as a means of promoting friendly and instructive discussions.

## SHEFFIELD MICROSCOPICAL SOCIETY.

The first general meeting of the session was held on Tuesday evening, November 7, when there was a large attendance of members. The newly-elected President, Mr. John Newton Coombe, was in the chair, and delivered an interesting inaugural address, in the course of which special reference was made to a recent examination of the Sheffield water supply, rotifers (*Brachionus rubens*), water fleas, nematoids, diatoms, desmids and other algæ being found in considerable numbers. At the conclusion a very hearty vote of thanks was accorded the President for his address.

## PHARMACEUTICAL MEETING AT PLYMOUTH.

At the first general meeting of the Three Towns and District Chemists' Association, held at the Mechanics' Institute, Plymouth, on Wednesday last, the following officers were elected for the ensuing year:—J. G. Netting (President), R. H. Rendle, F. Hunt (Vice-Presidents). Committee:—J. C. Park, A. D. Breeze, junr., J. D. Turney (Plymouth), F. Maitland (Stonehouse), M. Johnson, G. Breeze, sen. (Devonport), J. Maurice, W. Condy U'Ren (Auditors), J. Harvey Bailey (Treasurer), James Cocks (Secretary) (Stonehouse).

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting of this Association, held on the 9th inst., Mr. W. L. Currie presiding, Mr. Robert Tocher, pharmaceutical chemist, Maybole, read a paper on "Pharmaceutical Legislation," which consisted in the first part of a sketch of "past attempts at legislation," this being followed by comments on the Pharmacy Act of 1868, its interpretations, faults, and good points. The defence of unqualified assistants by some chemists was deprecated; the raising of the stamped medicine licence to five pounds per annum advocated; and the prescribing of ready made medicine protested against. The want of unity in the trade was blamed for the existence of the limited liability company difficulty, and it was urged that the keeping of drug shops by medical men was opposed to the spirit of the Pharmacy Act. Cutting of prices also received attention, the formation of branches of the Pharmaceutical Society throughout the country was said to be desirable, and the main object of the Association was explained to be to induce every chemist within reach to join the Society.

A lively discussion followed, in which Messrs. D. S. Robertson, Moir, Boyd, Robb, McEwen, Russell, Laing, and the President took part. In proposing an extra hearty vote of thanks, the President referred to the interest in the Association shown by Mr. Tocher in coming all the way from Maybole to address them that night; he had also been amongst the first to answer the circular letter and join the Association. The vote of thanks was heartily accorded. Four new members joined the Association.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The opening meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, November 8, at 9.15 p.m., Mr. Alexander J. Dey, President, in the chair. There was a large attendance.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Messrs. S. G. Crowder, D. B. Dott, A. Gibson, W. Smith and J. B. Stephenson, Edinburgh, J. Nesbit, Portobello, and D. Storrar, Kirkcaldy.

The President then proceeded to deliver the inaugural address. He first thanked the members very heartily for the high honour they had conferred upon him, and said it would be his endeavour to further the interests of the Association to the utmost of his ability. He said, however, that as the strength of a chain is only equal to that of its weakest link, it behoved everyone to do his best to strengthen and promote its welfare by attending regularly and taking an active part in the discussions. The benefits of membership in such an association were many and obvious, and they were highly spoken of by Mr. Gilmour in an address delivered to the Dundee Association a few years ago. Their Association had always maintained an honourable position, and it had been their boast that almost all the papers contributed during the last fifteen years had been by members of the Association. By the death of Mr. Ainslie the Association had lost a sincere friend and benefactor. For some years before his death he was unable to attend their meetings, but there were still some of their older members who had pleasant recollections of the kindly and encouraging words he addressed to them at the annual presentation of prizes. Although the Ainslie Pharmacy Prize would not again form a subject of competition, they had been fortunate in becoming the recipients of a handsome donation from the Local Committee of the British Pharmaceutical Conference, to be devoted to the prize scheme. The Committee therefore hoped to put before the apprentice members a list of prizes worthy of their serious consideration. In choosing a suitable subject on which to address them, he had found considerable difficulty, but he thought a few remarks on the recent prosecutions under the Pharmacy Act, in regard to the sale of patent and proprietary medicines, might not be amiss. The results of the various important law cases in which the Pharmaceutical Society has taken part since 1880 were then described at length, together with their bearing upon the practice of pharmacy, and it was pointed out that from the correct point of view the really valuable safeguard for the public lay in the special education and competence of the person who sells and compounds. It was the foundation principle of the Pharmacy Act that no one but a person of legally competent training and knowledge should have anything whatever to do with the selling of poisons, in any shape or form, to the public. To depart from this principle in the smallest degree opened the door to practices which would constitute a grave public danger, and it was to be hoped that any attempt at its infraction would be resisted to the utmost. This adherence to a high standard of special training and education on the part of the pharmacist was not only the best means of protection for the public but also the best ground on which the pharmacist could base his claim to the protection of the State in the practice of his profession. In the prize scheme of their Association, and in all its work, this aim had ever been kept in view, and those who entered most heartily into the work of the forthcoming session would be most likely to attain that professional eminence which was best fitted to command success.

Mr. J. W. Simpson, Vice-President, moved a cordial vote of thanks to the President.

Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch, in seconding the motion, said he had to congratulate the President on the able way in which he had treated what had been a vexed and stormy question. He thought the circumstances attending all the proceedings referred to furnished a very striking illustration of the great difference that might exist between the views of those who were the framers of an Act, and the views of those who had to interpret it. The recent decisions appeared to carry the provisions of the Act beyond the dreams of those who framed it. It was true that the position of registered assistants had thereby been bettered, and he thought that fact ought to bring home to them a higher sense of the responsibility that rested upon them as members of an onerous and honourable profession. With regard to the decision in the "licoricine" case, he entirely agreed with the President, and he felt sure the Society would not lose sight of the matter. The view he took was well expressed in the *Lancet* of November 4, in the following words:—"We repeat that the mere presence of a poison in a preparation should for many reasons be a bar to its indiscriminate sale, or else the provisions of the Act will to some extent be paralysed, and the mischief against which its provisions were intended to operate will be increased. It is difficult to draw a sharp line distinguishing between quantities which are fatal and not fatal, and to insert a section in the Act making a provision of this kind would be utterly impracticable." He had to congratulate the Association on its continued prosperity, and he hoped it would long flourish and prove a boon to the assistants and apprentices in the city.

Messrs. Boa and C. F. Henry also supported the vote of thanks, which was passed with acclamation.

The Secretary then read the Prize Committee's report on the essays sent in for competition for the Botanical Prize offered by Mr. S. G. Crowden. The essays described the botanical excursions held during the summer months, and described the plants collected. Mr. Crowden's prize was gained by Mr. John Harris Burns, 73, Princes Street, and the second best essay by George Lenter, 25, Ardmillom Terrace, was of such merit that the Committee awarded a special prize.

Mr. J. Laidlaw Ewing then presented the first prizeman with a copy of the British Pharmacopœia and 'Additions,' and the second prizeman with a copy of Hayward's 'Botanists' Pocket Book.' In doing so, Mr. Ewing said he was afraid it was more because he was Chairman of the Executive than because of any special qualification of his own that he had been asked to present the botanical prizes. He had to confess that he had often painfully felt his lack of practical botanical knowledge. Last summer he and Mrs. Ewing were visiting the Alps, climbing up sometimes to a height of 6000 or 7000 feet. Anyone who had been there would know the magnificence and grandeur of the scenery, with pine trees clothing the slopes, the green Alps towering above in the early summer sun, and the endless variety of beautiful wild flowers in great profusion all around. In the midst of such a wealth of botany he longed for the presence of some one who could describe the vegetation they so much admired. He felt sure that the essayists had acquired a knowledge of practical botany which would be a source of pleasure to them in after life. There was one point on which he would like to say a word. In his own case he made the mistake of beginning to study botany from a book, with the result that the long and unintelligible words gave him a "scunner" at the subject which it took an effort to get over. He thought these excursions in the summer time were not only an admirable exercise and relaxation, but gave a good opportunity of studying botany from the plants themselves, and then the reading of the book would be easy and profitable.

The President expressed the thanks of the Association to Mr. Crowden, and also to Mr. Ewing, and, in doing so, said he had pleasure in intimating that Mr. Ewing had generously offered a prize to take the place of the Ainslie Pharmacy Prize.

The President intimated that the next meeting would take place on Wednesday, November 22, when papers would be read by Messrs. Hill, Lyon, and Sutherland.

## Parliamentary and Law Proceedings.

### POISONING BY ARSENIC.

At a Coroner's inquest held at Oxford, on Thursday, November 2, it appeared from the evidence that Thomas Cave, a fruiterer, carrying on business at 126, Walton Street, on the previous Monday morning took from a small cupboard in the back downstairs room of his premises, a rather dark apartment, what he conceived to be Epsom salts, which he dissolved in water and drank. He was quickly seized with vomiting and internal pains, and during the afternoon Dr. Wilson was called in, but nothing could be done to avert a fatal result. Mr. Cave relapsed into a state of collapse and insensibility, and death took place during the night.

The report by Mr. Fisher, the Public Analyst, showed that the vomit had an alkaline reaction and contained arsenic. From four ounces he separated as sulphide of arsenic a quantity equivalent to about one grain of white arsenic, consequently the whole twenty-nine ounces of liquid submitted to him contained upwards of seven grains of white arsenic.

Dr. George John Wilson said, on Monday afternoon, shortly after four o'clock, the son of deceased came to him and said his father was ill with pain, sickness, and diarrhœa, after taking some Epsom salts. The boy said some vermin killer had been in the house for a long time, and that there might be something wrong about it. He prescribed some medicine to allay the vomiting, and heard nothing more until about ten o'clock the same night, when he was summoned to him, and found him insensible, in a state of collapse. He was not in pain then, but was dying. He died about two hours afterwards. He came to the conclusion that death was the result of irritant poisoning, and his opinion and Mr. Fisher's report coincided. There was no reason to suppose that anyone gave the deceased the stuff that caused death, white arsenic. He believed that the deceased must have taken it at about nine o'clock in the morning, when the stomach would not be empty, and the effects would be delayed. Arsenic was frequently used as a rat poison, and the law required that it should be coloured with some substance, black or blue, but there was no trace left of anything of the kind.

The jury returned a verdict that death was caused by white arsenic taken by deceased accidentally and by mistake.—*Oxford Journal.*

### POISONING BY PRUSSIC ACID.

At the Board Room, Ebury Bridge, Pimlico, last Wednesday, Mr. John Troutbeck held an inquest respecting the death of Sarah Myers, thirty-three, a single woman, late of 33, King Henry's Road, Chalk Farm, who was found in an unconscious condition in a first-class carriage at the Victoria Station of the London, Chatham, and Dover Railway, on October 30.

Isaac Myers, of 174, Regent's Park Road, an importer of fancy goods, said the deceased was his sister. Lately she had been very irritable, owing, he believed, to having nothing to occupy her mind. She had not done anything for some years, but there was no necessity for her to earn her living. On October 30 he received a letter from her, which he had since destroyed. In it she stated that she had had a quarrel with her mother about a trivial matter—the burning of some linen. She said she thought she would go out of her mind, and, hinting at an attempt she contemplated making to take her life, asked him to break the news gently to her mother, adding that her mother would be happier without her. She further stated that she was going by rail to some friends at Clapham. Witness telegraphed to Clapham, and received a reply stating that she had not been seen. He afterwards learned that she had been found in an unconscious condition in a railway carriage, and taken to St. George's Hospital.

Archibald Coacher, an assistant guard in the employ of the London, Chatham, and Dover Railway Company, gave evidence as to finding the deceased in the railway carriage. She was unconscious, and an empty bottle, labelled "Prussic acid, poison," was lying by her side.

Dr. Henry S. Elliott, house physician at St. George's Hospital, stated that death took place on Friday last, from the effects of prussic acid poisoning.

A verdict of suicide whilst temporarily insane was recorded.—*Standard.*

### SUPPOSED POISONING BY WINSLOW'S SYRUP.

An inquest was held at Hackney, on Wednesday, on the body of Constance Emily Kirk (or Crabb), three months old, daughter of a gasfitter, of Seal Street, Dalston. The child had been suffering from a cold, and its mother gave it a dose of Winslow's Soothing Syrup, which had been in the house some time. The child died shortly afterwards, and Dr. Charles Miller, of Stoke Newington Road, said that as the syrup had been standing it would contain a larger proportion of opium than usual, and the opium caused coma and death. A verdict of death from misadventure was returned.—*Pall Mall Gazette* and *Echo.*

### EXPLOSION OF COMPRESSED GAS CYLINDERS.

On Wednesday, November 8, a lad named John William Fuller, aged 14, of 65, Arthington Street, Bradford, in the employ of Messrs. Riley Brothers, lantern dealers, of Cheapside, Bradford, was engaged in carrying from the Exchange Station two heavily charged cylinders of compressed oxygen and hydrogen gas respectively, such as are used in working magic lanterns. When he had reached the end of the Drake Street subway he appears to have let one of these fall to the ground, when it exploded. The concussion could be heard as far away as the Town Hall. Fuller was instantly killed, being dreadfully mutilated by the flying fragments of the cylinder. His head was shattered, and the injuries to other parts of the body were extensive. Singularly enough no other damage was done either to the station buildings or to bystanders. It is stated that the unfortunate boy was trailing one of the cylinders along the ground, although that does not appear to have been the one which exploded.

On the following Saturday a careful examination of the fragments of the shattered cylinder was made on behalf of the Bradford Coroner (Mr. J. G. Hutchinson) by Mr. Herbert Morley and Professor Goodman, of the Yorkshire College, Leeds. The fragments were found to be twisted, bent, and broken almost out of recognition—one long strip, nearly half-an-inch thick, having been curled up almost like a shaving of lead. The particular class of cylinder which exploded is made by drilling out of solid steel—the valve end being "cupped up" to fit the socket after the drilling is completed.—*Yorkshire Post.*

## Reviews and Notices of Books.

REACTIONS.—A selection of organic chemical preparations important to pharmacy in regard to their behaviour to commonly used reagents. By F. A. FLÜCKIGER, Ph.D., M.D. Translated, revised, and enlarged by J. B. NAGELVOORT.*

This translation of a German work, published by Professor Flückiger last year, is intended to furnish practical information as to the reactions by which some of the substances recently introduced into medical and pharmaceutical use may be identified and distinguished from each other when in a state of absolute chemical purity. The limitation by which the treatment of the subject matter is thus restricted does not in any degree detract from the usefulness of the work, for though it does not profess to be a guide to the isolation and detection of substances in cases where they are associated with preponderating masses of other material, as in toxicological investigations, the information given in Professor Flückiger's work as to the chemical identification of alkaloids and analogous substances is most valuable for the purposes of ultimately demonstrating their presence in such cases. Chemical evidence bearing on that point is indispensable after the more difficult task of extracting and separating the substances sought for has been successfully performed For that purpose the knowledge to be acquired from a study of Professor Flückiger's work, and carefully following the directions it gives as to reactions, cannot fail to be of great assistance in the practical work of identification. Now that alkaloids and various chemical products of a somewhat analogous nature have come into such general use as medicinal agents, it is desirable that pharmacists should be familiar with the characters of these substances, and from that point of view the work done will be very serviceable to them.

The methods of applying tests are generally described in a simple and readily intelligible manner. The reagents to be used are to be prepared of definite strength by solution in water, and in the application of them the quantities to be used in proportion to the substance tested is in most instances particularly specified. For the production of colour reactions, the observance of this condition is often of considerable importance. The translation has been carefully done, but in some places the language employed has a rather Germanic form. As the work has been published in America, it is not surprising that the spelling of chemical names recommended in 1891 by the American Association for the Advancement of Science has been adopted, but that circumstance is to be regretted as a useless disfigurement of the text. There is no advantage gained by the use of such words as "sulfur" or "chlorin" sufficient even to compensate for their ugliness. In several other respects the nomenclature used by the translators is open to objection. The omission of the final "e" by which the names of bases are generally and conveniently distinguished is a decided mistake, since it leaves the alkaloids apparently in the same class as bodies like cotoin, vanillin, or saccharin. The names of chemical compounds are sometimes incorrectly given; thus, for instance, "sulfobenzoic ammonia" (p. 118) is not a correct translation of sulphobenzaminsauresammoniak, nor is "sulfo-benzoate of iron" the English equivalent of ferrisulfobenzaminat.

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* Detroit, Mich., U.S.A.: George Davis. Price $2·00.

DISEASES AND INJURIES OF THE TEETH, including Pathology and Treatment; a Manual of Practical Dentistry for Students and Practitioners. Illustrated. By MORTON SMALE, M.R.C.S., L.S.A., L.D.S., and J. F. COLYER, L.R.C.P., M.R.C.S., L.D.S.*

The authors of this volume have succeeded in placing before the dental profession a work that is a valuable addition to its literature, as well as being an excellent text-book for students. It contains ample proof of the care and trouble taken not only in selecting the subjects but in the systematic arrangement that is everywhere noticeable throughout the work. The practical side of the subjects has been kept constantly in view, and no one will fail to appreciate the almost entire absence of any reference to the many obsolete theories that unfortunately form so large a part of most works on dental surgery. The book supplies a long felt want, and it will be appreciated by all those who are competent to judge of its merits. The numerous illustrations throughout the book are most excellent, and the adoption of plain line figures to illustrate the meaning of the authors is a valuable method of impressing the subject on the minds of students. The innovation of introducing the word mandible in place of lower maxilla is a very desirable one, and it is to be hoped that this change will soon be universally adopted. The photo-micrographs will be thoroughly appreciated by all those familiar with dental microscopy. Perhaps the three best written chapters in this excellent work are those on abnormalities of the permanent teeth, treatment of caries, and the operation of extraction of teeth. The authors have rendered these otherwise difficult subjects comparatively easy to understand, and the part devoted to gold stopping is most ably written and essentially practicable, as it should be. Nothing could be plainer or more instructive than that portion devoted to the preparation of the various cavities and the different ways of introducing and manipulating gold as a filling material. In conclusion, after a careful perusal of this work, we feel that we cannot do better than recommend our readers who are interested in the subject to procure the work, as it will amply repay a careful study, and should occupy a prominent place in every dentist's library.

A GUIDE TO THE EXAMINATION OF THE URINE. By J. WICKHAM LEGG, F.R.C.P. Seventh Edition. Edited and Revised by H. LEWIS JONES, M.A., M.D., M.R.C.P.*

This little work has now reached its seventh edition, and may be presumed, therefore, to rest above serious criticism. There is probably no handbook on the subject so much used in this country by medical students and practitioners, and its popularity, we consider, is thoroughly deserved. The book does not profess to be a finished treatise on urinary analysis, but only a "concise guide . . . . to serve as a companion at the bedside to the busy practitioner." For this purpose it is in every way admirably adapted. As was, indeed, essential if the work were to be kept within proper limits, only a few of the best processes are given for the detection of the various principles of semeiological value. These selected methods are described very clearly and briefly, but with really all necessary detail. In an appendix, volumetric and other methods for quantitative determination are given, but it is considered to lie outside the scope of the work to describe fully the methods of preparation of standard solutions and other operations involving the use of the chemical balance. This distinctly lessens the value of the work as a laboratory companion, but in no way detracts from its clinical usefulness. We notice that the book is kept thoroughly abreast of the times, but the editor has been wise enough not to include new and untried processes merely for the sake of novelty. We can cordially recommend the work as a thoroughly reliable "Guide" for the use of medical men. Those pharmacists who are not called upon to carry out difficult urinary analyses, beyond the calibre of the average practitioner, will also find it useful and convenient.

THE LAW OF CREMATION. By AUBREY RICHARDSON (Solicitor).†

This book contains an outline of the history relating to cremation, ancient and modern, as well as a description of the legal aspect of this mode of disposing of the dead. It is also valuable as it contains the rules and regulations of various cremation societies at home and abroad. The work is sure to be widely read, and will doubtless do much to encourage this salutary and convenient method for rendering dead bodies, especially the victims of infectious diseases, harmless to the living. The book is very carefully written, and contains much valuable information on the social and legal aspects of cremation.

## Obituary.

Notice has been received of the death of the following:—

On the 8th of November, Charles Knowles Tomlinson, Pharmaceutical Chemist, Lincoln. (Aged 74 years). Mr. Tomlinson was a Justice of the Peace, and had been a member of the Pharmaceutical Society since 1843.

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* London: Longmans, Green, and Co. Pp. i.-xiii., 1 to 423. 15*s.*

* London: H. K. Lewis. Pp. i.-ix., 1 to 139. Foolscap 8vo. 3*s.* 6*d.*

† London: Reeves and Turner. Pp. i.-iv., 1 to 187. 5s.

On the 9th of November, Evan Hughes, Chemist and Druggist, London. (Aged 42 years).

On the 10th of November, Joseph Weedon, Chemist and Druggist, Crawley. (Aged 46 years).

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### CHINA AND THE OPIUM TRADE.

Sir,—In writing the letter which appeared in your last issue, Mr. J. T. Thursfield doubtless, like many others, has been misled by the wild statements disseminated throughout this country, with respect to our action in regard to opium. He states that "ever since the war of 1841, China has been compelled to admit our opium." This is quite untrue. Our first war began in 1840 (war having just been declared by the Chinese against us in the previous year), and was terminated by the treaty of Nankin in August, 1842. A supplementary treaty, tariff, and regulations of trade were negotiated in July and October, 1843, eleven and fourteen months after the conclusion of peace. In neither of the treaties, tariff, or regulations named was there a word constraining China to receive our opium. As to the present, that "the highest authorities would gladly do all in their power to suppress its use," is equally opposed to fact. The cultivation of native opium has been carried on for at least a hundred years, and it is at this moment grown in every province of the empire under imperial sanction. The views attributed to the highest Chinese authorities are purely of home manufacture. So recently as 1881, Sir Thomas Wade, then British Minister at Pekin, specially consulted the Imperial authorities as to their views anent opium. What was the reply he received? "The Central Government has not gone so far as to formulate a policy at all." The compulsion they had endured, according to the allegation made, for forty years, notwithstanding! Sir T. Wade then enquired "if a gradual diminution of opium import from India, until the trade was abolished altogether, would meet with the approval of the Chinese Government," to which the reply was that "such a plan would be useless; as long as the habit existed opium would be procured somehow, and if it did not come from India it would be procured elsewhere. A serious attempt to check the evil must originate with individuals. Philanthropic efforts to check the evil in the manner suggested by Sir T. Wade would affect the Revenue only, without in any way reaching the root of the mischief." In accordance with the policy thus pointedly enunciated by the Chinese Imperial authorities, who have, throughout our history from 1722 downwards, treated opium from a fiscal point of view, the import charges on opium were, in order to please them and at their special instance, allowed to be raised in 1885 from the £10 per chest tariff rate fixed in 1858 to £33 per chest, whereby the Chinese Government has obtained an enormous increase of revenue, which is still enjoyed. English opinion has altogether been misled, as I have shown in my "Note on the Opium Question" (Effingham Wilson), to which I venture to refer any of your readers desirous of acquainting themselves with the historic facts upon record.

*Forest Hill.* H. N. LAY.

### THE "SUPPOSED SENNA."

Sir,—In the report of the discussion on Professor Greenish's paper on "Certain Spurious Drugs Recently Imported," on page 391, I notice that your reporter has omitted some remarks made by me, and that the context is thus rendered somewhat inaccurate and misleading. Permit me to remedy the omission by a supplementary account of the facts stated by me. The "supposed senna" was not only sent to the Museum of this Society (by Mr. Wardleworth), but was also sent to Kew Herbarium for identification, under the name of "jaborandi." Dr. Stapf, of the Kew Herbarium, identified the leaves with those of a specimen in that herbarium, labelled "*Xanthoxylum*? Rio Janeiro, Dr. Glaziou." This specimen having flowers, Dr. Stapf was enabled to more correctly refer the plant to the genus *Pilocarpus*, of which genus it forms a new species, differing from all the previously known species of *Pilocarpus* in the small size of its leaves, and on this account Dr. Stapf proposes to call it *Pilocarpus microphyllus*, Stapf. The description of the plant, he tells me, will probably appear in the next issue of the *Kew Bulletin*. The specimens of *Xanthoxylum* shown by me at the meeting were exhibited with the view of illustrating the close relation between the two genera, *Pilocarpus* and *Xanthoxylum*. The species shown were the comparatively small-leaved *X. schinifolium* and *X. alatum*, and the large-leaved *X. Senegalense*. In the first two some of the leaves are as small as in the new *Pilocarpus microphyllus*, and in the third the leaves are nearly as large as those of the true jaborandi. I remarked that although the two genera approach each other in the form and character of their leaves, they differ in the inflorescence, which is usually a spike or raceme (not a "spiral," as reported on page 391) in *Pilocarpus*, but is generally a panicled cyme in *Xanthoxylum*. In connection with these "supposed senna" or "jaborandi" leaves, there appears to be a further confusion at Liverpool, for, on page 394 of the Journal, I find that Mr. Wardleworth (who sent the leaves to me and to Kew) exhibited "a package of leaves which closely resembled coca in odour and general character, but were in reality young jaborandi." I have no reason to think that the leaflets shown were other than the leaflets of *Pilocarpus microphyllus*, Stapf. Since the last evening meeting I have learned, on good authority, that these leaves came over with ordinary jaborandi. In this way the mistake may possibly have arisen.

*17, Bloomsbury Square, W.C.* E. M. HOLMES.

### REPLIES TO DISPENSING QUERIES.

Sir,—Regarding dispensing query signed "Fiat Lux," I imagine it is the liberation of iodine from the potass. iodide by the nitrous compounds in the tincture ferri perchlor. that has troubled your correspondent. If "Fiat Lux" prepares a small quantity of the mixture, omitting the iodide, he will find it remains clear and light-coloured. On adding the potass. iodid. a deepening in colour at once occurs, the odour of iodine is perceptible, and in a short time a dark precipitate forms. In reply to "Major," I beg to state that when pil. opii, gr. ss., is ordered, I supply a pill containing pulv. opii, gr. ss.; pulv. glycyrrh., gr. ss., excip. q.s. The latter usually consists of glycerin, ʒj., and syrup, ʒvii.

*Northampton.* J. CLOWER.

Sir,—"Fiat Lux" inquires what reactions occur in dispensing a prescription he sends you, and published by you in your issue of November 11. The mixture when made is rather a reflection upon the doctor's knowledge of what is compatible and likely to form an elegant mixture, and as a compound of strychnine is thrown down as a precipitate highly dangerous. Iodide of potassium and tinct. ferri perchlor. react upon each other, the ferric chloride losing a third of its chlorine and being reduced to the ferrous state, and the free chlorine liberating iodine from the iodide, forming chloride of potassium. On the addition of the liquor strychniæ a precipitate is formed similar to that obtained when liquor strychniæ is added to a diluted tincture of iodine. The sulphate of magnesium takes no part in the decomposition.

*London.* ROBT. H. JONES.

### Replies to Dispensing Queries.

Sir,—The mixture submitted by "Fiat Lux" should not be dispensed without reference to the writer. The reaction would, I think, take place in three stages. 1. The iron and magnesium salts exchange acidulous radicals. 2. The ferric sulphate is reduced to the ferrous condition by the iodide with liberation of iodine. 3. Iodine precipitates the strychnine (a solution of iodine in potas. iodid. being a general alkaloidal precipitant). "Major" is doubtless *literally* correct in regarding pil. saponis co. as pil. opii, the latter being a B.P. synonym, but my experience leads me to the conclusion that when a doctor writes "Pil. opii, gr. ½," he invariably means a pill containing half a grain of opium; just as he would intend a grain of quinine in each pill by ordering "Pil. quiniæ, gr. i." In the same manner I dispensed a prescription today: ℞ Suppos. morphiæ, gr. ⅓; mitte, iij., sending three suppositories, each containing one-third of a grain of morphine.

*Maida Vale, W.* R. H. Parker.

Sir,—In reply to "Fiat Lux," I quote the following from the 'Art of Dispensing,' page 195:—"Tinct. ferri perchloridi, indeed all non-scaled ferric salts, reduce iodide of potassium immediately on mixing, free iodine being precipitated as a black sediment. The following equation explains the reaction—$Fe_2Cl_6 + 2KI = 2FeCl_2 + 2KCl + I_2$. The mixture is a most dangerous combination, and should never be dispensed."

*Exeter.* E. Adams.

Sir,—In answer to "Major," I should, without hesitation, give ½ gr. opium pills, as to my mind ½ gr. doses opium are intended, presuming it is prescribed for an adult.

*Exeter.* J. H. Williams.

Sir,—In reply to "Fiat Lux," the reaction which takes place is as follows:—The potassium iodide is acted upon by the ferric chloride, with the liberation of iodine—

$$Fe_2Cl_6 + 2KI = 2FeCl_2 + 2KCl + I_2.$$

The iodine is dissolved by the excess of potassium iodide, and then forms the reagent much used for detecting alkaloids (see meconic acid in P.B.). The strychnine is thus precipitated in combination with iodine (see herapathite in Attfield's 'Chemistry').

*Manchester.* Chas. Turner.

Sir,—In reply to "Fiat Lux's" query, I think I may safely say that the brownish-red turbidity is iodide of strychnine (the reddish-brown colour being due to free iodine in the mixture). With the alkaloids iodide of potassium is incompatible, and I believe cases have been known where death has resulted from iodide of strychnine crystallising or precipitating out from a mixture, so that the whole of it was taken for one dose.

C. H. R.

Sir,—In reply to "Lux Fiat's" dispensing query, which appeared in your last issue, I beg to suggest to him that the reactions which would occur in the mixture are first the liberation of iodine by the action of the ferric chloride on the iodide of potassium, and the reduction of the iron to the ferous state, as represented by the equation $Fe_2Cl_6 + 2KI = 2KCl + 2FeCl_2 + I_2$, the iodine in its turn attacking the strychnine and precipitating the iodide of that alkaloid. It is a mixture I would be chary about dispensing without first consulting the physician who prescribed it.

*Oldham.* Et Lux Erat.

Sir,—In reply to "Major," there is not the slightest doubt that when a prescriber orders "Pil. opii, gr. ss.," he intends his patient to have ½ grain doses of opium, and any dispenser who would send out pil. saponis co., gr. ss., is, in my humble opinion, not fit to be entrusted with a prescription. Minor.

### Percentage Solutions.

Sir,—I have read your answer to A. Cruikshank with great interest, and should be much obliged if you would tell me how you would make the 5 per cent. solution of mercuric chloride if glycerin or rectified spirit were ordered instead of water as the solvent.

*Manchester.* W. Spencer Turner.

### Medium Paraffin.

Sir,—The excessive hardness of the B.P. ointments made with a mixture of hard and soft paraffin has been repeatedly noticed. The following proportions I find to answer admirably:—Paraffin dur., 1 lb., paraffin moll., 7lb. Melt together in a water-bath, and stir till cold.

*Northampton.* J. Clower.

*Errata.*—In the report of the evening meeting last week the word *Psycotria* on pages 392–3 should have been spelt *Psychotria*. On page 393, column 1, line 8, also, the word "ipecacuanha" should have been preceded by the word "false," the starchy striated ipecacuanha (see *ante*, p. 210) being what was referred to.

*Medicus.*—Legg's 'Guide to the Examination of the Urine' (H. K. Lewis, 3*s.* 6*d.*) will probably serve your purpose as well as any. See review on page 418.

*W. H. Pearse.*—The subject you comment upon is unsuitable for discussion in our pages.

*James Hogg.*—Apply to some dealer in such preparations.

## NOTICES OF MEETINGS NEXT WEEK.

### Wednesday, November 22.

*Edinburgh Chemists' Assistants' Association*, at 9.15 p.m.
"A Pharmacist's Experiences in Burmah," by Alex. Sutherland.
"A Botanical Ramble in Kent," by J. Rutherford Hill.
"The Pharmacy of Bromoform," by W. Lyon.
*Brighton Junior Association of Pharmacy*, at 9 p.m.
"The Pharmacy of the Syllabus," by L. Cooper.

### Thursday, November 23.

*Chemists' Assistants' Association*, at 8.30 p.m.
"Notes on the Chemical and Microscopical Examination of Urine, Sputum, etc," by E. J. Millard.
*Glasgow Pharmaceutical Association*, at 9.15 p.m.
Members' Meeting.
*Midland Pharmaceutical Association.*
Reading of papers at the Mason College, Birmingham.
*School of Pharmacy Students' Association*, at 7 p.m.
Introductory Address, by F. Ransom.

### Friday, November 24.

*Sheffield Microscopical Society*, at 8 p.m.
Practical Night. Demonstration by W. Jenkinson.

### Saturday, November 25.

*Pharmaceutical Football Club v.* Finsbury Polytechnic, at Shepherds Bush, at 3.15 p.m.; Reserves *v.* Clissold Reserves at East Finchley.

## BOOKS, ETC., RECEIVED.

Diseases of Dogs and Cats and their Treatment. By a Veterinary Surgeon. Pp. i.-vii., 1-200. London: Offices of the *British and Colonial Druggist*. 2*s.* 6*d*. From the Publishers.

Ueber einige Acokanthera-Arten und das Ouabain, Von Dr. L. Lewin in Berlin. Separatabdruck aus Virchow's Archiv. für pathologische Anatomie und Physiologie und für klinische Medicin. Pp. 17. Berlin, 1893. From the Author.

Communications, Letters, etc., received from Messrs. Christy, Gravill, Hill, Newsholme, Remington, Sage.

## NOTE ON A SPURIOUS SENNA.

BY W. T. THISELTON DYER, F.R.S., C.M.G., C.I.E.,
*Director, Royal Gardens, Kew.*

I may, perhaps, be allowed to add a few remarks to the notice of a spurious senna, communicated to the Pharmaceutical Society, by Professor Greenish, on November 8.

What is no doubt the same thing was sent to Kew for identification in the course of last month by Messrs. Evans and Sons, of Liverpool, as a "jaborandi (?)" from Brazil.

In our herbarium the leaves were identified by Dr. Stapf with a specimen collected in Brazil by Glaziou, which had been provisionally placed under *Zanthoxylum*. That, however, was ascertained by Dr. Stapf to have been an erroneous determination, and both leaves and specimen were found to be those of an undescribed but true species of *Pilocarpus*. The diagnosis of the new species will be published in a future number of the *Kew Bulletin*.

Dr. Paul's sample is said to have come from Tunis. But the reputed origin of commercial samples is often wide of the truth.

What is, however, interesting, is that we have had in our museum a sample of the same thing since 1887, when it was presented by Messrs. Burgoyne, Burbidges, Cyriax, and Farries. It is labelled "Arruda brava," with a note that it "has similar properties to jaborandi." It had been referred to *Zanthoxylum? peckoltianum*. This species is described by Engler in the 'Flora Brasiliensis,' vol. xii., part ii., p. 155. We have no specimen of it in our herbarium, but Dr. Stapf informs me that he has satisfied himself that the attribution of the museum specimen is incorrect. The name in fact belongs to a different drug, "Arruda do mato" (see *Pharm. Journ.*, Aug. 4, 1883, p. 85).

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## PODOPHYLLIN RESIN.

### A Note on the Quality of Some Trade Samples.

BY EDWARD D. GRAVILL AND C. EDWARD SAGE.

The very marked difference in the physical characters, and particularly the colour, of various trade samples of podophyllin resin, together with the fact that we have recently repeatedly met with samples of this resin of a very questionable character, has led us to make a comparative examination of a series of these samples with specimens of the resin known to be prepared in strict accordance with the directions contained in the British Pharmacopœia, and it occurred to us that the results obtained might prove interesting to readers of the *Pharmaceutical Journal*.

The colours of the samples examined varied from buff and pale yellow to yellowish and greenish-brown. We would here mention that the authentic samples, while varying to some extent in colour, were all of a more or less yellowish-brown colour. This we believe to be the proper colour of the resin when prepared in strict accordance with the British Pharmacopœia, any slight difference which occurs being probably due to the condition of the rhizome itself, the amount of water used in the precipitation, or the temperature to which the resin is exposed in drying.

The British Pharmacopœia recognises simply, as representing the resin, that portion of the rhizome precipitated with water from a spirituous extraction of the same; so that obviously the portion thus obtained, unless considerably altered by some chemical change, induced by the mode of preparation, should be entirely soluble, or practically so, in rectified spirit. This we have found to be the case in authentic samples of the resin; we have, however, found that it is by no means so in some trade samples which have come before our notice, as the table which follows will show.

The samples are numbered for the sake of convenience, and were obtained from various sources. They were submitted to exactly the same conditions of treatment, care being taken to thoroughly exhaust each sample with rectified spirit. The insoluble matter was then dried at 212° F. till constant in weight, and the results were as follows:—

| No. | | Per cent. |
|---|---|---|
| 1 | gave insoluble matter corresponding to | 52·75 |
| 2 | " " " " | 20·70 |
| 3 | was entirely soluble | |
| 4 | " " " | |
| 5 | gave insoluble matter corresponding to | 3·80 |
| 6 | gave traces only of insoluble matter | |
| 7 | " " " " " | |
| 8 | " " " " " | |

The portion insoluble in rectified spirit, in Nos. 1, 2, and 5, was examined microscopically, with the object of discovering its nature. Nos. 2 and 5 were found to consist of vegetable tissue, with a small quantity of starch, but No. 1 was observed to contain in addition some crystalline substance resembling silica. The starch and vegetable matters were found on comparison to correspond with those existing in powdered podophyllum rhizome.

The inorganic matters present in each sample were determined by incineration at a dull red heat till constant in weight, and resulted as follows:—

| No. | | | |
|---|---|---|---|
| No. 1 | gave of ash | 11·80 | per cent. |
| " 2 | " " | 6·00 | " " |
| " 3 | " " | 0·20 | " " |
| " 4 | " " | 0·30 | " " |
| " 5 | " " | 0·95 | " " |
| " 6 | " " | 0·20 | " " |
| " 7 | " " | 0·50 | " " |
| " 8 | " " | 0·50 | " " |

From several determinations of the ash yielded by authentic specimens of the resin, it has in no case exceeded 0·50 per cent., while the average yielded by podophyllum rhizome itself is only 3·10 per cent. In the latter case, the composition of the ash was found to be silica, iron, aluminium, calcium, and potassium, combined with carbonic, sulphuric, and phosphoric acids.

A qualitative examination of the inorganic matters from Nos. 1, 2, and 5, showed the same to consist of iron, calcium, aluminium, and potassium, combined with sulphuric and phosphoric acids; a fair quantity of free silica was also present, particularly in Nos. 1 and 2, the crystals noted under the microscopical examination of No. 1 consisting of this substance.

Sample No. 8, we may state, was prepared from *Podophyllum Emodi*, kindly supplied to us by Mr. J. C. Umney. It resembles ordinary podophyllin resin, with the exception that it is, if anything, a little paler in colour.

The conclusions to be drawn from the results of our examination are:—That trade samples of so-called podophyllin resin exist which are largely adulterated, and that the nature of the adulteration appears to be powdered podophyllum rhizome and earthy matters. That the colour of the resin is not a very material characteristic of its genuineness, and that samples yielding more than a trace of matter insoluble in rectified spirit, and much more than 0·50 per cent. of inorganic matter, on incineration, may be considered to be to a greater or less extent adulterated.

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## COPAIFERA SALIKOUNDA, HECK.*

BY E. HECKEL AND F. SCHLAGDENHAUFFEN.

In 1890 some black beans were received from M. R. P. Raimbault, a missionary at Konakry in French Guinea. These were stated to be used by the Susus (a tribe of negroes found between 9° and 11° N. lat., on the West Coast of Africa), under the name of "Salikounda." They have a distinct odour of coumarin. Believing that they might be of commercial interest, a supply for the purpose of chemical analysis was obtained from Sherboro' Island, where the tree appears to be plentiful. From the Rio Pungo Mission, fruits and leaves were received from which it was possible to refer the seeds to the genus *Copaifera*, but it was not until July, 1893, that specimens of the flowers were obtained, through the kindness of Dr. Drevon, the chief colonial physician at Konakry.

The material thus obtained showed that the tree was more nearly allied to the Central American species than to the known African species, the latter having trifoliate leaves (Oliver, 'Fl. Trop. Africa,' vol. ii., pp. 374, 375), whereas the Salikounda tree has paripinnate leaves, with three to five pairs of opposite leaflets. The leaflets are oval, entire, 4½ centimetres long by 2 broad, emarginate and somewhat unequal at the base, feather-veined, the veins being slightly velvety, and are without resin cells. The inflorescence is panicled and axillary. The flowers are small and yellowish-green, nearly sessile, and about 3–4 millimetres in diameter. The flower has three velvety caducous bracts, of which one is oval and larger than the other two. There are four sepals, which are imbricate, velvety, and unequal in size, the largest being about 4 Mm. by 3 Mm. There are ten stamens having filiform filaments inserted on a glandular ten-lobed disc. The ovary is hairy, one-celled, compressed, and contains two anatropous ovules. The style is 3 Mm. long, filiform, and curved, and the stigma is capitate. The tree is 10–15 metres high, and flowers in October. The fruits are produced in April. The pod is 3 centimetres long by 2½ broad, oval, compressed, gibbous, terminated by a sharp point, and of a chestnut colour. The inner surface is smooth, polished, and of a greenish-white colour. It contains usually only one seed, covered with a fine scarlet arillus, and attached by a slender orange filament.

This species is very near the American *C. Langsdorffii*, from which it differs in the nervation of the leaves, which are less rich in anastomosing veinlets, in the absence of secreting cells in the leaves and stem, in the larger size of the flowers and their less hairy character, and in the more readily caducous bracts. It thus forms an interesting connecting link between the American and African species. The tree is found abundantly also in the Callisocco country, especially around Cape Verga and in Haut-Forécaréah.

The seed, when dry, has a distinct odour of coumarin. All parts of the tree, except the leaves, have the same odour, according to Dr. Drevon; a hard resinous exudation found on the trunk also smells of coumarin. The arillus of the seed has not the same perfume, and is generally removed in the samples sent to Europe.

In Sherboro' Island, the seeds are used by the natives to form a fragrant pomade. In the Rio Pongo district the women break the seeds into pieces, with which they make necklaces. In medicine it is employed to relieve vertigo and giddiness; for this purpose a cold infusion of the seed is taken. It also serves to perfume snuff. According to the agent of the French Senegal and West African Coast Company, residing at Sherboro', the seed was valued at 5*s.* per lb. at Liverpool in 1888.

A chemical examination of the beans showed that the seed without the integuments contained 0·80 per cent. of coumarin, and the seed coats only ·027 per cent. The seeds contained also 4·12 per cent. of oil, together with starch, sugar, albumin, and colouring matter, traces of tannin, whilst in the seed coat the ash contained much manganese.

On a comparison being made with Tonka beans, the seeds of the latter deprived of their coats yielded 1·233 per cent. of coumarin and 37·933 per cent. of oil, and the integuments 3·158 per cent. of coumarin and ·004 per cent. of oil. The seeds also contain manganese. It thus appears that the integument of the Salikounda seed is not quite so rich in coumarin as the seed itself, whilst in the Tonka bean the seed coats contain more than twice as much as the seed itself, and the Tonka bean contains 17–18 times as much coumarin as the Salikounda bean.

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## VALUATION OF PEPSIN.*

BY E. H. BARTLEY, B.S., M.D.,

*Dean and Professor of Chemistry in the Brooklyn College of Pharmacy.*

The last edition of the Pharmacopœia requires that a pepsin shall be capable of digesting not less than 3000 times its own weight of freshly coagulated and disintegrated albumin when tested by the process described in it, and that saccharated pepsin shall digest 300 times its own weight of freshly coagulated and disintegrated albumin. The process given there is as follows: An egg is boiled in water for fifteen minutes, cooled, opened, and the coagulated albumin separated and rubbed through a sieve of 30 meshes to the linear inch, rejecting the first portion passing through. Ten grammes of this disintegrated pepsin is weighed off for the experiment. A digesting fluid of acidulated water and pepsin is then added, and the material is to be shaken every fifteen minutes for six hours. At the expiration of this time the albumin should have disappeared; *i.e.*, it is in solution. The description of this process, as given in the U.S.P., admits that trustworthy results can only be obtained when the contents of the flask are agitated uniformly and at regular intervals of time, *i.e.* the whole attention of the operator must be given up to the test for a long period of time (six hours). The temperature of the bath must be carefully regulated during all this time, and the shaking must be accomplished with great care. Counting the time that it will take to prepare the albumin, at least three-quarters of an hour, the whole process will require about seven hours, or from eleven in the forenoon until six in the evening. It is very evident that the time required is too long and the care to be exercised is too great for the process to be often made use of by the pharmacist. In the valuation of pepsin it is important that uniformity of results should be obtained. It is a matter of surprise and regret that the Committee on Revision has seen fit to retain this somewhat unsatisfactory process.

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* Abstract of a paper in the *Annales de la Faculté des Sciences de Marseille.*

* Read before the Kings County Pharmaceutical Society, September 12, 1893. From the *American Druggist and Pharmaceutical Record*, October 5.

There are a number of errors which have been before pointed out. It has heretofore been assumed that the white of egg prepared as above is uniform in composition. That such is not the case, the writer has proven by actual experiment. In making a quantitative determination of the proteid materials in the whites of eggs, I found a variation of from 10 to 13 per cent. It will be noticed, on opening different eggs, that in some the so-called white is very thin and watery, while in others it is thick and ropy. The specific gravities of these will vary with the percentage of dry albumin in solution. That is, the higher the specific gravity the greater the amount of albumin in solution. I found that in an egg with a white shell the amount of albumin and globulin combined was 10 per cent., while in a brown egg I obtained 13 per cent. Unless, therefore, a considerable number of eggs are taken, and the albumin coagulated from these is well mixed, uniformly concordant results cannot be expected, because the amount of albumin taken differs with the composition of the egg white. Again, in the comminuted state, the size of the particles has an important bearing upon the time of complete digestion, and upon the amount digested in a given time. As the digestion proceeds, the particles of disintegrated albumin agglutinate into masses, unless the shaking be almost constant. The frequency and the thoroughness of the shaking, then, will vary the result. Any attempt to work with solids in suspension must be unsatisfactory, unless constant agitation is secured. This requires some form of mechanical power, as no one could stand and shake a series of flasks for six hours. If we can employ a solution of albumin in making the test, instead of the suspended solid, we may avoid the necessity of shaking. The reaction between liquids is always more uniform than between a solid and a liquid. In order, therefore, to improve upon the U.S.P. method, I have modified it by working with a solution of albumin. Here we may easily obtain uniform results. To do so, however, it is necessary to start with a liquid of uniform and constant composition. This can be accomplished as follows:—

Several eggs are opened and the albumin thoroughly mixed, which can be done without difficulty. Starting then with this uniform egg white, we may weigh out any desired amount, mix it with 9 times its own volume of distilled water and boil for 5 to 10 minutes. We thus get a slightly turbid or opalescent solution. This solution is then brought to the requisite temperature, acidified, the pepsin added, and the temperature kept constant until the albumin is digested. The time of the disappearance of the albumin is determined by bringing a drop of the solution in contact with a drop of nitric acid. Albumin is coagulated by strong nitric acid. The acid does not coagulate peptone.

The time consumed in the digestion of a given amount of albumin is inversely proportional to the activity of the pepsin used. It is best in practice to so regulate the proportions of pepsin and albumin that the digestion will be complete in two hours, but not in one hour.

The method of procedure which I have adopted is as follows:—

*Solution No.* 1.—Take the whites of several fresh eggs, mix them thoroughly, and to 100 grammes of the mixed egg albumin add 900 C.c. of distilled water, or in this proportion if smaller quantities are used. Mix the solutions well, and boil from 3 to 5 minutes. After cooling, make up the solution with water to the original volume. That is, add the water lost by evaporation during the boiling. Ordinarily, however, the loss is so slight that it may be neglected. The solution may be strained, if necessary, through fine muslin; but if the eggs are fresh only a slight coagulum will form during the boiling, and we will have a slightly opalescent solution of cooked egg albumin, containing 10 per cent. of egg white. As egg white contains, as an average, about 12·2 per cent of dry albumin, 100 C.c. of this solution will contain 10 grammes of egg white, or 1·22 gramme of dry albumin.

*Solution No.* 2.—Weigh out one gramme of the pepsin to be tested, add to 25 C.c. of water, and then add 2 C.c. of diluted hydrochloric acid U.S.P. Now add water enough to make the solution up to 50 C.c.; or, if it be a high grade pepsin, make up to 100 C.c. after adding 4 C.c. of diluted acid.

*Procedure:* Measure out into a beaker or bottle 50 C.c. of the albumin solution, and warm in a water bath to 35° to 40° C. (95° to 104° F.). Now add to this solution 2 C.c. of diluted hydrochloric acid, U.S.P., and from one-half to five cubic centimetres of the pepsin solution. The more active the pepsin the less the quantity to be taken. In the valuation of high grade pepsins it is best to use 100 C.c. of albumin solution, containing 10 grammes egg-white, and 1 C.c. of pepsin solution containing 0·010 gramme pepsin. It may sometimes be necessary, with an unknown pepsin, to perform a preliminary test to determine the approximate time, before spending too much time on an accurate test. It is best to so regulate the quantity of pepsin and albumin that the time shall be about two hours.

The time when the pepsin is added must be carefully noted, and the temperature of the solution must be kept between 35° and 40° C. (95° to 104° F.) At intervals of 10 minutes, after the first hour, draw out a few drops of the solution with a nipple pipette (dropper) and float it upon a small quantity of pure nitric acid in a conical minim glass. The digestion is incomplete as long as a white zone of coagulated albumin appears at the line of contact of the two fluids. Note the time when the nitric acid ceases to give this coagulation. This end-reaction can generally be easily determined. We thus get three elements in the calculation of the digestive power of the pepsin, viz.:

The weight of the egg-albumin, A.

The weight of the pepsin taken, P.

The time consumed, T.

We next assume a standard time of three hours, the average time of stomach digestion; or, we may assume the arbitrary six hours of the U.S.P. This time seems irrational, and is longer than normal stomach digestion lasts. Hence I would advise the statement of the digestive power of a pepsin, to give the amount of albumin digested during three hours. The relation between the quantities of albumin and pepsin is expressed by the fraction: $\frac{A}{P}$, *i.e.*, it is found by dividing the amount of albumin, 5 grammes, in the above directions for weaker pepsins, by the amount of pepsin used when 1 C.c. of the solution above mentioned is taken for the test, viz., ·02 Gr. This would give as the amount of albumin digested by one part of pepsin in the observed time of the experiment as 250 Gr. But the time is not the standard time. Assume that the time required for the digestion was 2 hours. The relation of this to the standard time, 3 hours, would be $\frac{3}{2}$. The above result must then be multiplied by this ratio in order to give the amount of albumin capable of being digested in the standard three hours. To put this in the form of an algebraic equation we have: D (digestive power) $=\frac{A}{P}\times\frac{3}{T}$. Substituting the above values we have:

$$D=\frac{5}{.02}\times\frac{3}{2}=\frac{15}{.04}=375 \text{ grammes.}$$

That is, 1 gramme of this pepsin is capable of digesting 375 grammes of egg albumin in three hours, or 750 grammes in six hours.

As egg-white contains about 12·2 per cent. of dry albumin, 1 Gr. of this pepsin will digest 45·75 Gr. of dry albumin in 3 hours or 91·5 Gr. in 6 hours.

The advantages claimed for this process over the U.S.P. method are:

1. The shorter time consumed.
2. Uniformity in results.
3. The avoidance of the necessity for shaking the solution during digestion.
4. A more exact statement of results.
5. The weaker solution of albumin used gives less interference with the action of the pepsin by the peptone formed.

## THE APPLICATION OF ELECTROLYSIS TO QUALITATIVE ANALYSIS.*

BY CHARLES A. KOHN, PH.D., B.SC.,

*Lecturer on Organic Chemistry, University College, Liverpool.*

The first application of electrolysis to chemical analysis was made by Gaultier de Claubry in 1850, who employed the electric current for the isolation of poisonous metals, using platinum electrodes, on which the deposition of the metal took place.

Other early workers followed in this direction, and in 1861 C. L. Bloxam published two papers on "The Application of Electrolysis to the Detection of Poisonous Metals in Mixtures of Organic Matters" (*Journ. Chem. Soc.*, xiii., 12 and 338). The author appears to have made extensive use of the methods described in these papers, which have reference to the detection of arsenic, antimony, mercury, bismuth, and copper. The electrolysis was effected in acidulated solutions, from which the arsenic was evolved as hydride, whilst the other metals were deposited in the metallic state upon the cathode and subsequently tested, after dissolving, by the usual reactions.

Since the publication of these results, the advances in electrolytic analysis have reference to quantitative methods only, and the advantage of these latter for qualitative work has been to some extent overlooked.

Within the last twelve years Classen and his pupils have placed a number of electrolytic methods for the determination and separation of metals in the hands of chemists—methods which have been added to by the labours of E. F. Smith, Vortmann, and others.

These methods are of special value when applied to qualitative analysis in cases of medical or medico-legal inquiry. They are not supposed to supersede in any way the ordinary methods of qualitative analysis, but to serve as a final and crucial means of identification, and thus render it possible to detect very small quantities of the substances in question with great accuracy. As such, they fulfil the required conditions admirably, being readily carried out, comparatively free from contamination with impure reagents, and capable of being rendered approximately quantitative whenever desired.

The method devised by Bloxam for the detection of arsenic, in which all fear of contamination with impure zinc is avoided, has been elaborated by Wolff (*Journ. Soc. Chem. Ind.*, 1887, p. 147), who has succeeded in detecting 0·00001 Grm. of arsenious acid by this means.

It is in connection with the most important of the remaining mineral poisons that I have examined the applicability of these electrolytic methods, viz., antimony, mercury, lead, copper, and cadmium.

### *Antimony.*

The method employed in the case of antimony is that adopted in its quantitative estimation by means of electrolysis, a method which ensures a complete separation from those metals with which it is precipitated in the ordinary course of analysis, arsenic and tin. This fact is of considerable importance in reference to the special objects for which these methods have been worked out.

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* A paper read before the British Association (Section B), Nottingham Meeting, 1893. Reprinted from the *Chemical News*.

The precipitated sulphide is dissolved in potassium sulphide, and the resulting solution, after warming with a little hydrogen peroxide to decolorise any polysulphides that may be present, electrolysed with a current of 1·5 – 2 C.c. of electrolytic gas per minute (10·436 C.c. at 0° and 760 Mm. = 1 ampère), when the antimony is deposited as metal upon the negative electrode. One part of antimony (as metal) in 1,500,000 parts of solution may be thus detected—a reaction thirty times more delicate than the deposition by means of zinc and platinum. The stain on the cathode, which latter is best used in the form of a piece of platinum foil about 1 Cm. in diameter, is distinct even with a solution containing $\frac{1}{38}$ Mgrm. of antimony, and by carefully evaporating a little ammonium sulphide on the foil, or by dissolving the stain in hot hydrochloric acid and then passing a few bubbles of sulphuretted hydrogen gas into the solution, the orange-coloured sulphide is obtained as a satisfactory confirmatory test. The detection of 0·0001 Grm. of metal can be fully relied on under all conditions, and one hour is sufficient to completely precipitate such small quantities.

### *Mercury.*

Mercury is best separated from its nitric acid solution on a small closely-wound spiral of platinum wire. The solution to be tested is acidified with nitric acid and electrolysed with a current of 4–5 C.c. (C.c. refer to C.c. of electrolytic gas per minute). The deposition is effected in half-an-hour. The deposited metal is removed from the spiral by heating the latter gently in a test-tube, when the mercury forms in characteristic globules on the upper portion of the tube. As a confirmatory and very characteristic test, a crystal of iodine is dropped into the tube, and the whole allowed to stand for a short time, when the presence of mercury is indicated by the formation of the red iodide. 0·0001 Grm. of mercury in 150 C.c. of solution can be clearly detected.

Wolff has applied this test under similar conditions, using a special form of apparatus through which the solution to be tested is allowed to pass slowly, and in which a silver-coated iron electrode is employed as the anode.

### *Lead.*

Lead is precipitated either as $PbO_2$ at the anode from a solution containing 10–20 per cent. of free nitric acid, or as metal, at the cathode, from an ammonium oxalate solution. In both cases a current of 2 to 3 C.c. suffices to effect the deposition in one hour.

Here, again, 0·0001 Grm. of metal in 150 C.c. of solution can be easily detected. With both solutions this amount gives a distinct coloration to the platinum spiral on which the deposition is best effected. As a confirmatory test, the deposited metal is dissolved in acid and tested with sulphuretted hydrogen, or the spiral may be placed in a test-tube and warmed gently with a small crystal of iodine, when the yellow iodide of lead is formed. The latter reaction is very distinct, especially in the case of the peroxide.

Of the above two methods, that in which an ammonium oxalate solution is used is the more delicate, although it cannot be employed quantitatively, owing to the oxidation that takes place on drying. An addition of 1 Grm. of ammonium oxalate to the suspected solution is sufficient.

A great advantage of the electrolytic method as a crucial means for the detection of minute quantities of lead lies in the fact that, when the lead is deposited as peroxide from a nitric acid solution, it is completely separated from mercury, copper, cadmium, arsenic, antimony, and iron, none of which are deposited at the anode in this case. Manganese is the only commonly occurring element that behaves similarly.

This method is, therefore, of value for the determination of lead in water, citric and tartaric acids, baking-powders, etc.

If quantitative results for small quantities of lead are required, the best plan is to effect the electrolysis in nitric acid solution, as above, employing a small platinum dish as the anode, to which the deposited peroxide adheres well, and which can be weighed as $PbO_2$ after washing and drying at 110° C. May has suggested (*Zeit. f. Anal. Chem.*, xiv., 344) the ignition of the $PbO_2$ to PbO and final weighing of the latter; but a loss always occurs under these conditions, which increases with the quantity of the peroxide present. This loss amounts to 2–3 per cent. of the weight of lead deposited.

### *Copper.*

0·00005 Grm. of copper can be very readily detected by electrolysing an acid solution in the usual way. A spiral of platinum wire is employed as the cathode, and the presence of the metal confirmed by dissolving it in a little nitric acid and testing with potassium ferrocyanide.

Quantitative results in solutions containing 0·001 Grm. of metal are thus obtained with considerable accuracy, and the method, as in the case of lead, is of use for the detection of minute quantities of the metal in waters. The advantages of electrolysis over the colorimetric methods usually employed in such cases are two-fold. In the first place, concentration is not necessary, owing to the delicacy of the test; and, secondly, the erroneous results that are obtained in all colorimetric processes, due to the influence of the varying constituents present in the solution tested on the accuracy of the reaction, are entirely obviated.

### *Cadmium.*

Cadmium is deposited in the metallic state both from potassium cyanide and from potassium oxalate solutions, the former of which is preferable. A current of 0·2 C.c. is sufficient, and 0·0001 Grm. of the metal can be thus detected. To confirm, the deposit is dissolved in hydrochloric acid, the solution diluted and treated with sulphuretted hydrogen.

### *Detection of Metallic Poisons in Urine by Means of Electrolysis.*

To apply the above methods in cases of poisoning, the organic matter with which the metals are associated must first be destroyed in the usual way by means of hydrochloric acid and potassium chlorate, and the solutions or precipitates obtained in the ordinary course of analysis then subjected, at suitable stages, to electrolysis. In such cases the advantages of electrolysis lie, again, in the delicacy and reliability of the tests, and also in the fact that the small quantities of organic matter with which the solutions obtained in such cases are contaminated do not interfere with the electrolytic tests as they do with the ordinary wet tests. By passing the current for a longer time than is required for ordinary aqueous solutions the organic matter is decomposed and thus prevented from affecting the reliability of the tests.

The detection of metallic poisons in urine can be directly effected by electrolysis.

The presence of mercury or of copper is detected by acidifying the urine with 2–3 C.c. of nitric acid (conc.) and electrolysing as described. 0·0001 Grm. of metal can be detected thus in 30 C.c. of urine, or 1 part in 300,000 of urine.

Lead does not separate well as peroxide from urine acidified with nitric acid, but if ammonium oxalate be added the reaction is quite as delicate as in aqueous solution, and 0·0001 Grm. of lead can be thus detected.

Antimony can be detected directly in urine, according to Chittenden (*Proc. Connecticut Acad. of Science*, viii.), by electrolysis after the addition of 2–3 C.c. of dilute sulphuric acid; but this process was not found satisfactory. The better plan is to first precipitate by sulphuretted hydrogen and then electrolyse as described.

In all these cases it is necessary to pass the current at least twice as long as when aqueous solutions are employed. In twenty-four hours a current of 1–2 C.ò. completely decomposes urine, leaving a clear and colourless solution.

A comparison of the delicacy of these tests with the ordinary qualitative tests for antimony, mercury, lead, and copper by means of sulphuretted hydrogen showed that in the case of antimony and of copper the electrolytic tests were one and a half times more delicate; whilst with mercury and lead they were at least ten times more so. These comparisons were made in aqueous solutions.

In testing urine the value of the electrolytic method is still more evident; for here the colour of the liquid interferes materially with the reliability of the ordinary qualitative tests when only small quantities of the elements referred to are present. This was well instanced in a case of suspected lead poisoning in which the patient had been treated with potassium iodide. A direct test with sulphuretted hydrogen gave no reliable result, even after standing twenty-four hours; whilst the deposit obtained on electrolysis gave a distinct precipitate of lead sulphide after being dissolved in acid.

Other applications of the more reliable electrolytic methods of analysis to qualitative work can only offer attraction in special cases, and the data on the subject are to be found in the many electrolytic methods already published. It is by their judicious combination with the ordinary methods of analysis that a saving of time and labour, and, above all, an increased reliability and accuracy is effected.

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## THE CASTOR BEAN IN INDIA.

Numerous varieties of the castor oil plant (*Ricinus communis*) are met with in India, all of which, however, may be classed under two main types. The one of these represents a tall bush or small tree, and is a perennial, grown as a hedge plant, whilst the other is an annual plant, grown either as a crop, or more frequently in rows or lines through fields containing other crops. Large seeds, yielding an abundance of an inferior oil, are obtained from the tree-like plant, whereas the annual produces a small seed from which the finer qualities of oil are derived. The primitive methods for the cultivation of the soil in vogue in India are also applied to the raising of the castor oil plant. The crop is very seldom irrigated, and usually depends upon the rainfall. Six months' growth are necessary before the capsules form, and the picking of the seed commences in the seventh and terminates in the ninth month. The seed pods are stacked in a corner of a house, covered with straw and compressed by weights to exclude the air and bring about the softening of the capsules. This takes place after six days, whereupon they are dried in the sun and the seeds loosened by beating with a heavy wooden mallet, any seeds remaining in the husks being obtained by a repetition of the processes of drying and beating.

While in most parts of India the different varieties of the castor bean are simply designated the large and the small, three kinds seem to be generally distinguished in the presidency of Bengal, namely, the "Chunaki" (small size), the "Gohuma" (middle size), and the "Jagia" (large size). The first of these is planted without previous preparation of the land, and no further care is bestowed upon the crop. The stems reach a height of from ten to twelve feet. The Gohuma variety, considered the best, and cultivated with greater care than the former kind, grows only six feet high. Jagia is generally sown with Indian corn. Chunaki seeds are bright black, dotted with grey. Gohuma seed somewhat resembles wheat in colour, and Jagia seed is red and slightly flattened. The treatment of the fruits after harvesting consists in allowing the pods to rot in small trenches with water or liquid manure, and then proceeding to release the seed in the manner already described. The processes of extracting the oil differ somewhat in different districts. The following methods are in use in the Madras Presidency.

1. After having been roasted in a pot and pounded in a mortar, the seed is boiled with four times its volume of water, with frequent stirring with a wooden spoon. After a time the pot is removed from the fire and the oil skimmed off. From the residue, by a second boiling, a further quantity of oil is obtained superior to that of the first boiling.

2. The seed is first boiled, then dried in the sun, and heated as in the first process.

3. The seed, after soaking in water over night, is crushed in the ordinary native oil-mill and then squeezed between folds of cloth.

In Bengal the seeds are partially roasted in a pan and pounded in a mortar, without being husked, the oil being extracted by boiling with water in a manner similar to that already described. The oil obtained is freed from moisture and impurities by boiling in a separate pan.

These defective native methods have been supplanted to some extent by European processes, in which machinery is employed. Thus in one of the manufactories at Calcutta a very pure medicinal oil is obtained by careful cleaning of the seed by hand, breaking in the crushing machine, and subsequent cold-pressing in hand presses. The oil is bleached and purified by exposure to the sun in galvanised iron vats, careful boiling, treatment with charcoal, and filtration through flannel or paper. A second quality is made by hot-pressing the seed, treated as in the previous case. This oil, without being filtered, is exported in large quantities. A third quality is derived from the seed husked by machine, which is less clean and therefore lower in price. Previous to being crushed the seed is invariably exposed to the sun, this being essential for the removal of moisture and the liquefaction of the oily matter. The boiling of the oil is conducted with great care in copper pans (sometimes with the addition of from ⅛ to ¼ part of water), and is the most delicate part of the whole process of manufacture, the length of the operation being a matter of judgment based upon experience.

The uses to which castor oil is generally put in Europe are well known. In India it is much used for burning in lamps, for it gives a light surpassing in brilliancy that obtained by means of any other vegetable or mineral oil, and possesses the further advantage of great safety and freedom from smoke in burning. It is also largely used as a lubricant for machinery; as a dressing for hides and skins it enjoys an excellent reputation, and the Indian dyers also make frequent use of it. The press cake forms a useful manure, and is a very good material for making illuminating gas. Gas thus made is used at the Allahabad East Indian Railway station. In Assam the leaves of the plant furnish food for the silkworm, and good paper pulp can be made from its bark.—*United States Consular Reports*, through *Journ. Soc. Chem. Ind.*

## OTTO OF ROSES IN BULGARIA.

Owing to untimely rains just before the rose harvest, the 1892 yield of otto was very small, amounting only to 250,000 miskals, or about 2,750 lbs., little more than half an average crop. On the other hand prices were high, 5 fr. to 5½ fr. per miskal, and the total value of the yield was approximately £52,000, the average being between £60,000 and £70,000. The principal countries of export were England, Germany, France, and the United States. It is feared that the extreme cold of the past winter will result in another small crop for 1893.—*Consular Report*, 1300.

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, NOVEMBER 25, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## ETHICS.

LIKE a ghost in an old house—at home but not at ease—the subject of ethics flitted across the minds of members of the Pharmaceutical Conference at Nottingham more than five and twenty years ago, and has been but little heard of since. There was on that occasion a very general agreement that ethical principles are admirable enough in themselves, but at the same time there was an uncomfortable suggestion that the business of a chemist and druggist was not adapted for their practical application, or was not then carried on under conditions which would admit of it. Since that time there has been a very material alteration of the conditions which then prevailed. In place of the possibility that any person, whether competent or not to perform the duties attaching to the business of a chemist and druggist, could carry it on and assume the title, there has been substituted a State recognition of the necessity for scientific knowledge and technical training, and a legal qualification has been established, on the basis of which chemists and druggists have been incorporated as a body possessing certain privileges and having corresponding duties to fulfil.

Meanwhile a multitude of subjects have more or less earnestly occupied the attention of chemists and druggists in their new position, medicine stamps and licences, poison regulations, company trading, the question whether their calling is a trade or a profession, trade interests, territorial representation, the meaning of the term "patent medicine," and the sale of poisons generally. All these and others have been in their turn burning questions for a time, but the subject of pharmaceutical ethics has still maintained the ghostly character it presented at the time above referred to, and has only on rare occasions been caught sight of as it were by accident. Still there are indications at the present time that, in connection with various occupations, ethical considerations have forced themseves upon the notice of those engaged in them, and even among chemists and druggists there has been some perception of the fact that the interests of individuals are largely subordinated to and affected by the observance and fulfilment of mutual obligations.

In many of the addresses delivered at the inauguration of the present session of the medical schools throughout the country this tendency to consider ethical obligations has been particularly marked. Notably the address of Sir James Crichton Browne at the opening of the Sheffield Medical School, in which he treated of the evolution of ethical ideas from a biological point of view as being a necessary condition of existence, and that address, already referred to in this Journal (*ante*, p. 309), is a case in point. In other inaugural addresses the same subject has been touched upon, and in none has that been done in a manner more directly reflecting upon the relations of chemists and druggists to each other than in some of the remarks made by Mr. Lane in the address delivered by him at the opening of the session at St. Mary's Hospital. In alluding to the extension of the medical curriculum, Mr. Lane expressed the opinion that it would not fail materially to elevate the standard of the medical profession and to enhance the value of a diploma. Though it might lessen the number of those embracing medicine as their calling, it would at the same time remedy some of the ills of overcrowding in their ranks, amongst which were excessive competition, and the consequent diminished value attached to professional services. Addressing himself to those approaching the end of their student career, Mr. Lane exhorted them to use their most earnest endeavours to uphold the honour and dignity of their profession. He instanced the institutions known as medical aid associations as presenting one of the inducements which might be held out to them to deviate from the path of professional rectitude, and assume a position demoralising to the individual medical man who lent himself to it, and damaging as well as degrading to the whole profession. In regard to this system, it was suggested that the powers of the governing bodies should be extended, so as to enable them to deal with and control the "minor morals" of the profession. A similar suggestion has recently been made in regard to the business of the chemist and druggist, and it may be pointed out that by a practical application of ethical principles,—company trading—one of the chief causes of complaint and dissatisfaction among chemists and druggists at the present time might be entirely done away with, or at least materially reduced. There are also several other directions in which the application of ethical principles might prove of advantage to pharmacists, and it may not now be premature to expect to see more attention paid to their observance.

## NOTE ON A SPURIOUS "SENNA."

In connection with the subject regarding which Mr. Thiselton Dyer and Mr. Wardleworth write (see pages 421 and 440), we are informed by Professor Greenish that, since the publication of his paper on spurious drugs, he has ascertained that he was accidentally misled regarding the specimen he examined. This, he was led to suppose, consisted of leaves similar to those imported from Tunis, which were ascribed to *Pistacia lentiscus* at the time of presentation to the Society's Museum. He has since ascertained, however, that two distinct samples had been inadvertently confused, the one he examined and commented upon being that sent by Mr. Wardleworth, of Liverpool. It consists of totally different leaves to those first mentioned. Subsequent examination of another portion of the Tunis specimen by Professor Greenish and the Curator, Mr. Holmes, confirms the original opinion that it consists of the leaves of the mastich tree. It is needless to say that this explanation does not in any way detract from the value of Professor Greenish's work, the result arrived at being, indeed, all the more creditable considering the unfortunate complication introduced into the investigation.

## RESTRICTIONS ON THE USE OF MORPHINE IN HONGKONG.

An ordinance has been enacted by the Governor of Hongkong, with the advice and consent of the Legislative Council, for the purpose of suppressing the practice, widely prevalent in the Colony, of injecting morphine. It prohibits the administration by injection of morphine or its salts, except on the prescription of a duly qualified medical man, the onus of proving the exception lying on the person administering the injection, and the penalty, on conviction of an offence, being a fine not exceeding fifty dollars or imprisonment, with or without hard labour, for a period not exceeding two months. A further offence, liable to similar penalties, consists in furnishing morphine or its salts, or solutions of the same, to any person except a duly qualified medical practitioner or a chemist and druggist, the onus of proof of the exception again resting with the person charged with the offence, whilst the section does not apply to the furnishing of morphine for the purpose of *bonâ fide* exportation. Constables or Officers of the Police, duly authorised by warrant of any Justice of the Peace, are permitted to break into any place which the said Justice shall have reasonable grounds to suspect and believe to be a place kept or used for the injection of morphine, contrary to the provisions of the Ordinance, and to arrest any persons found in the place suspected of an offence, whilst seizing all morphine, hypodermic syringes, and other appliances that may be found, capable of being used for the injection of morphine. These, on conviction of the offender, are directed to be forfeited.

### THE TRADE IN COMPRESSED GASES.

The circumstances connected with the cylinder accident at Bradford—referred to in last week's Journal, and in the report of the inquest at page 438 this week—are of so much importance in connection with the business of practical pharmacists, that we are making enquiries into the conditions under which compressed gases are supplied for medical use and for application in the illustration of lectures and other purposes, and hope very shortly to be able to give our readers some information on this subject. In reference to the bursting of the cylinder at Bradford, it may be stated that in Germany, where this industry was originated, by the production of liquid carbonic acid, the cylinders used for the purpose of transporting the acid were subjected to periodical inspection and testing by Government officials before they were allowed to be sent out.

### CAMBRIDGE UNIVERSITY EXTENSION.

The twentieth annual report of the Cambridge University Extension Lectures, just published, gives particulars regarding the summer meeting held at Cambridge this year. Lectures on scientific, historical, literary, and other subjects were arranged so as to form connected series. Thus, the scientific courses were grouped so as to illustrate the "Progress and Methods of Scientific Discovery." About six hundred and fifty students attended the meeting, staying for three weeks to a month, and very favourable reports were received from the lecturers, the majority of students attending having done serious work of a kind it would otherwise have been difficult to accomplish.

### UNITED STATES PHARMACOPŒIA.

In our description of the new edition of this work it was mentioned (*ante*, p. 202) that, to facilitate analytical work, a number of very useful tables were furnished as an appendix to the book. These have now been reprinted by the Committee of Revision under the title of 'Select Tables from the U.S. Pharmacopœia, 1890' (Philadelphia: P. Blakiston, Son, and Company). They are in a convenient form for ready reference, being printed on detached sheets, which may be mounted on cardboard and suspended where required.

### HONOURS FOR PHARMACISTS.

Amongst the newly elected mayors are the following:—Mr. S. R. Anness, J.P., Pharmaceutical Chemist, Ipswich, Local Secretary to the Pharmaceutical Society; Mr. Frederick Jones, Chemist and Druggist, Bridport; Mr. Edgar Neale, Chemist and Druggist, Chippenham; Mr. E. S. Wootton, Chemist and Druggist, Margate; and Mr. Edward Watson, Chemist and Druggist, Beccles. Mr. John Buchanan, Chemist and Druggist, Cullen, has been appointed a magistrate for that burgh, occupying the post of Junior Bailie.

### INSTITUTE OF CHEMISTRY.

The opening of the new examination laboratories belonging to the Institute of Chemistry will take place on Friday, December 8, at 1 p.m., and subsequently luncheon will be served at the offices of the Institute, 30, Bloomsbury Square.

### PHARMACY ACT PROSECUTIONS IN GLASGOW.

At the Glasgow Summary Court, the following cases were down for hearing before Sheriff Birnie on Thursday last:—William Reid Craig, assistant, in the shop of Dr. Hugh Kelly, at 114, Clarence Street, Glasgow, was charged with two offences for selling oxalic acid to Joseph Tait, on July 28 and 29 respectively; James Downie, apprentice in the same shop, was also charged with selling oxalic acid to Joseph Tait, on July 28 last; William Tomlinson, assistant in the shop of Dr. Hugh Kelly, at 133, West Scotland Street, Glasgow, was charged with selling oxalic acid to Joseph Tait, on July 28, and with selling prussic acid, opium, and chloroform, in a mixture, to John Rutherford Hill, on July 29; Hugh Miller, assistant to Dr. J. W. White, in the shop, 13, Morrison Street, Glasgow, was charged with selling a bottle of Dr. J. Collis Browne's chlorodyne, containing morphine and chloroform, to Joseph Tait, on July 29; Robert White, medical student and assistant in the same shop, was charged with two offences for selling oxalic acid to Joseph Tait, on July 28 and 29 respectively, and with selling prussic acid, opium, and chloroform, in a mixture, to J. Rutherford Hill, on July 29; James Brown, 229, St. James' Road, Glasgow, was charged with selling oxalic acid to Joseph Tait, on June 15 last; Mrs. Agnes Walker, 10, Candleriggs, Glasgow, was charged with two offences for selling oxalic acid to Joseph Tait, on June 15 and July 28 respectively; Robert Fleming, grocer, 117, Houston Street, Glasgow, was charged with keeping open shop for the sale of poisons, having sold bottles of Dr. J. Collis Browne's chlorodyne to Joseph Tait, on June 15 and July 28 respectively. The case against Downie, a little boy, was withdrawn, but all the other defendants were found guilty, and mulcted in fines and expenses for each offence. Notice of appeal were lodged in the cases of Craig, Miller, Tomlinson, and White. A full report of the proceedings will appear in the Journal for next week, but it may be noted that most of these prosecutions are of importance as being the first clear cases against *bonâ fide* doctors' assistants, whilst Fleming's case is the first prosecution under Scotch law for the sale of a proprietary medicine containing poison by an unregistered person.

### YEAR-BOOK OF PHARMACY.

The official record of the transactions of the British Pharmaceutical Conference, at the Nottingham meeting, is published some weeks earlier than last year, and it may be hoped that succeeding volumes may appear with still greater promptitude. The work is arranged on the usual lines, comprising abstracts of papers of interest to pharmacists, published up to the end of June last, together with a selection of notes and formulæ, and a bibliography of the year.

### REVOCATION OF A PATENT FOR MEDICINE.

The fact of the revocation of Sleight's patent for an improvement in cough mixtures, by the Court of Chancery (see *ante*, p. 377), is briefly notified in the *Illustrated Official Journal* for November 22, under the heading "Patents Revoked," thus—"1892, 20377, Sleight."

# Transactions of the Pharmaceutical Society.

## MEETING OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

### MR. J. LAIDLAW EWING IN THE CHAIR.

A meeting of the Executive of the North British Branch was held in the Society's House, 36, York Place, Edinburgh, on Thursday, November 16, at 12 noon.

Present:—Messrs. Currie, Kinninmont, and McAdam, Glasgow; Davidson, Montrose; Ewing, Gibson, Noble, and Stephenson, Edinburgh; Fisher, Dunfermline; Hardie and Kerr, Dundee; Johnson, Paterson, and Strachan, Aberdeen; Nesbit, Portobello; Storrar, Kirkcaldy, and Sutherland, Dumfries.

An apology for absence was received from Mr. Kermath, St. Andrews.

The minutes of last meeting were read and approved.

The Chairman said before proceeding to the nomination of Examiners he had a motion to propose, which he was sure would meet with cordial approval. They were aware that Messrs. Kinninmont and Stephenson were retiring from the Board of Examiners this year. Mr. Kinninmont had served for a long period, and had discharged his duties with dignity and devotion. He had not been in very robust health of late, but they all hoped he would have good health and enjoy the pleasant evening of life. Mr. Stephenson had been Chairman of the Board during the whole period for which he had been an Examiner, and they all knew the amount of time and devotion he had given to their service in that capacity. He had much pleasure in moving that the following resolution be entered in their minutes:—

> "The Executive desire to put on record an expression of its high appreciation of the valuable services rendered by Mr. Kinninmont and Mr. Stephenson, as Examiners, the former having been for twenty-one years, and the latter for seventeen years, members of the Board of Examiners for Scotland; and it further desires to express its appreciation of the able manner in which Mr. Stephenson has discharged the duties of Chairman during that period. In thus thanking them for the work they have done the Executive would express a hope that they may be spared for many years to adorn the ranks of Scottish pharmacy."

Mr. Kerr, Vice-Chairman, seconded the motion. He thoroughly concurred in all that had been said by Mr. Ewing.

Mr. Nesbit said as an Examiner he would like to say how much they all regretted the retirement of Messrs. Kinninmont and Stephenson. Mr. Stephenson had managed their business so efficiently that his loss would be difficult to replace. He had been able to adapt himself both to the candidates and the Examiners, and they could not have got through so much work with so little trouble but for his wise guidance.

The motion was unanimously adopted.

Mr. Kinninmont said he had to thank them for the kindness and courtesy with which this motion had been proposed and adopted. He had been just forty years connected with the Society, having joined it in 1853. When he became a member of the Board the examinations were a very small affair, but they had grown very much since then. His period of service as an Examiner had been to him a time of great happiness. He was pleased to be able to testify that the Board had always acted harmoniously during the time he had been a member of it.

Mr. Stephenson said he was very much obliged for their kind expression of thanks. He was very conscious of his deficiencies, but had honestly tried to do his best. His ideal was that the Board of Examiners was a body of gentlemen who knew how to respect themselves and how to respect one another. His duties as Chairman had been a labour of love, and he thought their business had been conducted with as little friction as could reasonably be expected in human affairs.

The Executive then went into committee to consider the nomination of Examiners, and on resuming, on the motion of the Chairman, seconded by Mr. McAdam, the following resolution was unanimously agreed to:—

> "That Peter Boa (Edinburgh), David Brown Dott (Edinburgh), Jonathan Innes Fraser (Edinburgh), Adam Gibson (Edinburgh), James Jack (Arbroath), Thomas Maben (Hawick), John Nesbit (Portobello), and John William Sutherland (Dumfries), be nominated for election by the Council as members of the Board of Examiners for Scotland for the year 1894."

The Assistant Secretary read a letter from the Secretary authorising the Executive to proceed with proposed new buildings, the plans for which had been approved by the Council. The Chairman stated that the Dean of Guild Court had passed the plans and granted warrant, and the work would be proceeded with at once. There had been a few weeks' delay owing to the illness of the architect. It was remitted to the General Purposes Committee with power to fix the contracts and proceed with the buildings.

The Assistant Secretary read the report of the General Purposes Committee as to the steps which had been taken to carry out the scheme of the Executive for the appointment of local secretaries in Scotland. From this it appeared that appointments had been made or would be made by the Council for all the places suggested, except Ayr and Kelso, as to which no arrangement had yet been found possible. It was hoped, however, that the difficulties in regard to these would be got over before the next meeting of Council. It was agreed to remit to the General Purposes Committee to take any further steps required for the carrying out of the scheme.

Mr. Kinninmont said that Messrs. Currie, Paris, and Moir had been nominated as divisional or assistant secretaries in Glasgow, but they had not yet decided as to the apportionment of their duties. At their meeting a desire was expressed that each officer should be provided with a Register and a Calendar. It was also thought desirable that they should have a supply of "Particulars of Examinations" and application forms for the "Preliminary."

Mr. Currie said the point referred to by Mr. Kinninmont had been thought by the meeting to be rather a weak point in the organisation of the Pharmaceutical Society. He thought they should do something like an insurance company, and be more free in the distribution of literature relating to the Society. In this way they might induce a larger number to join. If an officer had always beside him the necessary forms he might get men to join on the spot when they were in the mood, whereas without the form the opportunity might slip.

Mr. Strachan said a supply of proposal forms for joining the Society could be got by applying to the Secretary at any time.

The Assistant Secretary said copies of the Register and the Calendar would be supplied to the new officers, but with regard to the other papers there were reasons which made it desirable that they should be obtained direct from the office of the Society.

The Chairman said that doubtless the members of Council present would make a note of what had been said, and have it attended to in the proper quarter.

The Assistant Secretary reported the arrangements as to the Evening Meeting, and these were again remitted to the General Purposes Committee.

The Assistant Secretary read a letter from Mr. C. F. Henry, Hon. Secretary of the Edinburgh and District Chemists' Trade Association, thanking the Executive for the privilege of meeting in the Society's House, and asking a continuance thereof.

It was unanimously agreed that the Association should continue to have the use of the Society's House for meetings.

The meeting then closed.

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## EVENING MEETING IN EDINBURGH.

*Friday, November* 17, 1893.

MR. J. LAIDLAW EWING IN THE CHAIR.

The first evening meeting in Edinburgh of the present session was held in the Society's House, 36, York Place, on Friday, November 17, at 8.30. There was a large attendance.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Professor Sir Douglas Maclagan, M.D.; Dr. T. A. G. Balfour, Dr. William Craig, Dr. Gibson, Dr. Murdoch Brown; Messrs. Strachan, Aberdeen; Jack, Arbroath; and Noble, Lunan; D. Mackenzie, J. Robertson, and Glass, Edinburgh.

The Chairman then said: The quickly revolving year brings us again to the beginning of a new session, which I hope will be as successful and instructive as its predecessor. From time to time eminent medical and scientific men have addressed us; two years ago we were addressed by Professor J. Bayley Balfour, last year by Professor Charteris, and now I have to introduce to you Dr. Cash, Professor of Materia Medica in the University of Aberdeen. Dr. Cash was a distinguished graduate of Edinburgh University, and has since acquired a high reputation as a physiologist and pharmacologist. He has published several original papers of great importance. One of these, a "Report on the Action of Certain Chemical Disinfectants," is of high practical value; another, in conjunction with Professor Dunstan, on "The Physiological Action of the Nitrites of the Paraffin Series," is of special interest to us, from the fact that the chemical part of it was carried out in the Research Laboratory of the Pharmaceutical Society. On account of these important contributions and his scientific eminence Dr. Cash was made an honorary member of the Pharmaceutical Society this year, and that being so it is not inappropriate that he should appear here to-night to deliver our inaugural sessional address. I have now much pleasure in calling upon Professor Cash to address you.

Professor Cash then proceeded to deliver his address.

### INAUGURAL SESSIONAL ADDRESS.

BY J. THEODORE CASH, M.D., F.R.S.,

*Regius Professor of Materia Medica in the University of Aberdeen, and Honorary Member of the Pharmaceutical Society.*

Mr. Chairman and Gentlemen,—I desire to express to you, in the first instance, my keen appreciation of the honour this important branch of the Pharmaceutical Society has done me in asking me to address its members here to-night. It is an honour which I appreciate all the more when I think of those more experienced and more worthy who have preceded me here, many of whose names must be writ large in that special panel of the temple of Fame which is surely reserved for those who have promoted the advancement of the healing art.

The fact that many of these have been, as pharmacologists, engaged in the examination of the action of new products, the outcome of analytical and synthetical processes, indicates that we have all a large field of common interest, that whilst working in different capacities and under various names we are all entitled to participate in the crown of the harvest.

And it is certain that this divided labour is very necessary and favourable to the value of the final result.

Not merely must the chemical processes by which a new medicinal substance is determined be exact and capable of producing a pure substance with which the pharmacologist may deal in assigning to it its probable value as a remedial agent, but also the highly important question of its adaptation to the purposes of curative medicine must be solved in order that the physician may be duly equipped with his new weapon.

Thus, after the product has been obtained, its development into an established therapeutical agent is perforce gradual and complex in its progress.

Purely chemical and pharmaceutical processes must be associated with pharmacological and therapeutical ones.

The product having been obtained, these questions, amongst others, arise:—

*Why do we use this drug?*

This involves the creed of the pharmacologist, who will recount the scientific proof he has accumulated as to its mode of action and the indication this offers for its employment in treatment.

*How is it to be used?*

Here the answer to a large extent comes from the pharmaceutist, who studies the most advantageous way of utilising the drug and of preparing it in many forms for the exigencies of practice.

*When should it be used?*

The therapeutist must give the final reply: He who bearing in mind and relying upon the labours of the men who answered the queries, why? how? applies the accumulated knowledge to the cure or prevention of disease.

Who shall say then that we are independent of one another in our work, or that any of us can afford to withhold our sympathy and interest from those labouring in other departments in the same field?

Gentlemen, this labour is demanded of all the workers, and in the future it will be even more strenuously exacted than it has been in the past.

It does not entail any rash prediction to forecast that the advent of a new remedy will be through the channels of close research and study, and that the scientific practitioner of the future will refuse to make use of anything which reaches his hands by less certain ways. Pure empiricism is decaying, although as it breeds its own sort, most truly and unvaryingly of all principles, it is likely that its decline will be but gradual in character. We may perhaps be tempted to envy the man who has seen benefit from a certain course of treatment, and who therefore uses it with a blind but tenacious confidence, though in his mind it has no why or wherefore; but for all that we shall leave him in exclusive enjoyment of his fetish, for we shall scarcely be tempted to follow his practice.

Credulity is—let us thankfully believe—losing its hold of all of us, and whether the cry is a new cancer cure by green or yellow electricity, or a great Chinese cure, the rush of the credulous amongst those who have been educated to discern the right hand from the left in medical matters is a very small one.

But it is not likely that in this generation or the next the will of the wisp will fail of a following amongst the uneducated and uninstructed.

We cannot deny our compassion to the credulous, for if ignorance is one part of credulity gentle faith is the other, and to her kindly assistance we should be churlish to withhold our expression of indebtedness. But credulity may be shaken by firm example, and I hope much from the example of confidence we can justly give in that which has been "weighed in the balance" and not found wanting.

All that tends to make facts clear and appreciable, that removes ambiguity, that sweeps away mystification, will surely shorten the reign of credulity, and I believe it to be our duty, moral and politic, to discourage belief in the disguised and mysterious, which endeavours to mask its true features from the searching light of scientific enquiry.

I look upon it that the scheduling of many patent remedies under the Pharmacy Act will tell in the right direction. The label will at least teach the purchaser that there is not—as he may very well have supposed previously—a bye-path outside the domain of recognised medical practice by which powerful effects can be obtained without the employment of powerful means.

So whilst admitting my small liking for the existence and use of these bodies, it is to my mind satisfactory that those of them which are poisonous within the meaning of the Act should at least have their true nature in this respect conspicuously recorded upon them.

May I be permitted to reiterate my belief that if we are to advance the cause of curative medicine, it will be by honest, open work, work upon which we shall not shrink to challenge criticism, work which will become more stable and valuable when it has passed through the ordeal to which others—as earnest seekers after truth as we may be—shall subject it.

That all we do shall succeed is barely to be hoped; it is quite unlikely to be realised. Repeated failures may be needed to teach us all the lessons which are essential to the acquirement of successful endeavour, logical reasoning, of patience and of humility; but if the aim is kept in view, there is the cheering thought that

> "Victor from vanquished,
> Issues at the last."

Recent records bear unimpeachable testimony to the extraordinary progress which is being made in the direction of furnishing the practitioner with fresh remedies of definite chemical composition.

There has been what one may term a genuine "spate" of bodies having germicidal, antipyretic, and hypnotic properties. To some a permanent position is reserved; others are already vanishing; and whilst of the latter certain could well be spared, a small residue which promised fairly has been jostled out of sight and are in danger of being lost to us.

If there is a fault in this wealth of production, it is that its very magnitude threatens to exceed the strength of the pharmacologists, a comparatively small body of men dealing with processes of examination which are necessarily slow and time-exacting.

This is to my mind one reason why some of these bodies, whilst possessing considerable value, yet not having received the attention requisite to establish their action upon a firm basis, are liable to fall short of the position they are really entitled to achieve amongst curative remedies.

Amongst other lines of labour, a steady attempt has been made to produce modifications and combinations of certain carbon compounds of the aromatic and fatty series, with the object of enforcing and improving their effect, or else of eliminating some undesirable property or action which the original substances possessed.

The fact that such a body as sulphonal has been proved to possess valuable hypnotic properties, but that its prolonged and unintermitted use is accompanied by some danger, has led to the introduction of trional and tetronal, which contain increasing proportions of ethyl. The theory advanced by Baumann and Kast that the hypnotic value would be increased proportionately with the ethylic contents, has not as yet been clearly supported by experiment, and it is premature to allot them a precise position.

But if, as seems likely, Ranoni is justified in preferring them to sulphonal, not merely on account of their more rapid primary effect, but because of the after action being less disadvantageous, they may be used as alternatives to this drug with distinct advantage.

The substitution of methyl in the phenyl group of antifebrin has led to the production of tolypyrin, which possesses, according to Guttmann, as full an action in reducing pain and pyrexia as the more current remedy. By some the newer remedy is preferred to the older.

As a result of the search after substances which will prove toxic towards micro-organisms, whilst relatively harmless towards man and the higher animals, coloring matters, many of them coal-tar derivatives, have passed largely into practice. These pigments have long been recognised as bacteriological stains for the purpose of demonstrating the presence of certain microbes, and it is highly interesting and instructive to note that the selective power they exert in this respect may indicate a destructive property, which may be used to advantage in the treatment of disorders associated with such microbes and their products.

Methylene blue, owing to its action on streptococci and certain bacilli, has passed into extensive use.

Methyl violet has likewise met with considerable success, though its more strongly marked irritant properties constitute a hindrance to its extensive use as a germicide.

A very interesting communication was published comparatively recently by Guttmann and Ehrlich upon the action of methylene blue in malaria.

They had noted the affinity possessed by the microbe, which appears to be causal to the fever towards this particular stain, and they therefore decided to test the action as a curative agent. Their results were decidedly encouraging, as regarded both the disappearance of the micro-organism and the checking of the fever. The drug was here administered in anticipation of the attack, and repeated in small doses at intervals.

The necessity for an increase and improvement in our armament of remedies is frequently suggested by epidemics which threaten the community, and undoubtedly the extension of the cholera westwards has given us a peculiar interest in those disinfectants which will act powerfully and with their maximum energy in the alimentary canal.

The nature of this disorder favouring a considerable passage of fluid, in which the comma bacillus rapidly propagate into the lumen of the intestine, accompanied by an almost complete suspension of absorption, indicates the local action of remedies. Energetic disinfection which will not injure the patient is here of primary importance. So the relative advantages of salol, phenyl salicylate, which yields carbolic acid in the intestine, of the old tannic acid treatment, and of various naphthols, amongst which β-naphthol is very promising, have been fully discussed. With reference to the last named body, β-naphthol, the experience of Sternberg is of high importance, that the growth of the comma bacillus is limited by a proportion of 1-16000, whilst a strength of 1-2000 destroys these micro-organisms in 15′.

From these facts Dr. D. Stewart, of Philadelphia, estimates that less than ʒi will probably be sufficient to thoroughly disinfect the alimentary canal of a choleraic patient.

however, this was a substance toxic towards man, the importance of this disinfection would not be great, but it is the reverse, for Bouchardat has estimated the toxic dose as being over 8 ozs. avoirdupois.

One cannot but regard these experimental data as furnishing strong hope, not merely for the active treatment of, but for the prophylaxis against this dreaded disorder.

The rapidity with which cholera develops and progresses is probably after all our greatest difficulty.

Increased facilities for the employment of iodine, which has admirable disinfectant properties, but is unfortunately both a powerful irritant and odorous agent, have also been sought for.

Aristol, containing 46 per cent. of iodine, formed by the action of thymol in caustic soda solution upon an aqueous solution of iodine with caustic soda, and also more recently iso-butyl-ortho-kreosol iodide, commonly known as europhen, have been introduced. Both of these bodies serve the purpose held in view, and so facilitate our employment of this important element.

Iodopyrine is decomposed on entering the stomach, and therefore exerts the disinfectant action of iodine, and the complex effect of phenazonum.

The trichloride of iodine, which, however, acts by virtue of both its separable elements, has been found by Kitasato to possess the value of a powerful disinfectant, but it is by no means a non-irritating preparation.

Turning to another department of enquiry, you will recollect the extensive use into which caffeine has come lately as a diuretic remedy, and I may be permitted to remind you that one of the earliest contributions to our knowledge of its therapeutical effect was made by your townsman, Dr. Brackenridge.

But a salt of theobromine, the sodio-salicylate, has recently appeared under the name of "diuretine," which promises to take a still more important place than the parent alkaloid, the effect it produces being not only more powerful, but also of longer continuance.

The position of this new salt amongst diuretics has been more fully established recently by an exhaustive paper emanating from Professor Dujardin-Beaumetz' laboratory. It is shown to have scarcely any effect in increasing the strength of the heart contractions, and further that its influence upon the central nervous system is inconsiderable; on the other hand its effect is produced chiefly in the kidneys themselves, the secretory cells being strongly stimulated.

This process of evolution of a therapeutical agent is natural and satisfactory. We can scarcely say the same with regard to the increase of our knowledge concerning some other remedies. I will refer to *Gelsemium nitidum* by way of example. Here is a drug, concerning the action and composition of which much uncertainty existed at the time of its introduction into the Pharmacopœia.

Something had been done by Bartholow and others to obtain scientific proof respecting its action, but the practice with it was often of the wildest nature.

It seems to have been fired like the swivel gun of the amateur wild-fowl sportsman into the flock of diseases passing by, in the hope that something would be hit. We are now getting to know more that is definite about it.

Recently the researches of Cushey have shown that two distinct alkaloids, to a large extent antagonistic, are present in the wood, one having a tetanising strychnine-like effect; whilst the second, gelseminine, actually paralyses, by exerting a curare-like action upon the motor nerve terminations. These facts will make it necessary to reconsider the advisability of employing the whole plant, or of having recourse to its isolated principles.

I venture to think that it would be wisdom to withhold the introduction of such a body into an official list until such information as is requisite for its scientific adaptation and employment in treatment is actually in our hands.

Whilst in these various directions and in many others undoubted progress has been made, there have been developments of a character so startling that they have forced their way into the public journals, and have become topics of everyday conversation.

They deal with the question of procuring immunity from infection of many kinds, and of the possible cure of infective disorders already contracted. The subject has already become a vast one, and its application to curative medicine is so urgently demanded, that many workers have entered the field of investigation.

Let me say a word or two on some of the directions this inquiry has taken.

In one department, in which we are all specially interested, the progress, though apparent, has not been by any means all that could be desired. I refer to the use of ascertained disinfectants within the body as immunising or curative agencies.

There is scarcely room for reasonable doubt that if we can so modify the tissues by a process of medication in itself harmless towards them, so that they will cease to afford those conditions necessary to the multiplication of infective micro-organisms, we shall be able to produce a powerful counteracting effect towards many diseases.

This is the problem which lies before us; it involves other questions affecting the possibility of stable combination in the tissues, and the strengthening of the destructive power with which the tissues are unmistakably endowed.

The physician has in his mind the main object of increasing resistance on the part of the organism when he gives quinine in malarial fever, and when he uses guaicol in pulmonary tuberculosis; but we are only beginning to realise by careful experiment and observation what the actual value or potentiality of such disinfection is. The attempt to render animals immune from disease by a previous administration of disinfectants has been attended with a certain degree of success. At the same time, many substances which would seem to promise much have disappointed expectation. It is obvious that a drug which is a disinfectant outside the body may not fulfil all the conditions necessary to disinfection within the body.

I feel reluctant to quote experiments of my own, but as these bear upon the question, I trust you will pardon a proceeding which might otherwise appear egotistical on my part. Some years ago, when I was working for the Local Government Board on the subject of chemical disinfection, I tested a number of disinfectants by administering them for a prolonged period to animals which were ultimately inoculated with pathogenic micro-organisms.

In this way, amongst other bodies, sulpho-carbolate of sodium, phenyl propionic acid and its potassium and sodium salts were examined, but with regard to both anthrax and tuberculosis the results were practically negative, no increased resistance to the invasion of these disorders being observable.

Perchloride of mercury, however, gave more encouraging results, and I ultimately succeeded in demonstrating that this body produced an immunising action when administered daily to rabbits in minute doses before the inoculation of anthrax took place.

Positive results have been recently obtained by the method of Kitasato as applied by Behring, who successfully administered the disinfectant—in this case the terchloride of iodine—after infection had been communicated by inoculation of the tetanus bacillus.

Many attempts to modify the composition of tissues by similar methods, so as if possible to interfere with microbic multiplication, have had a negative result.

Thus the chlorides of calcium, strontium, magnesium, and aluminium respectively, introduced into the food of guinea-pigs by Bokenham, did not affect the activity of the anthrax virus which was inoculated subsequently. But little as we have to show as yet, I believe that with the introduction of disinfectants which, whilst having a high toxicity towards microbes, are relatively innocuous towards the tissues of the higher animals, we may still achieve a brilliant reward by further work in this direction. Whether the ultimate place of such treatment shall be prophylactic as well as curative, whether it should stand alone or in conjunction with the methods at which we are about to glance, I cannot venture to predict. But this is certain, that we all have a deep interest in the question and its solution.

You are aware that in the castor oil seed, and in that of jequirity (*Abrus precatorius*), principles exist bearing the names of ricin and abrin, both intensely toxic bodies, so that very minute fractions of a grain are fatal to many mammals when introduced directly into the circulation.

With these bodies, described as toxalbumins, some very wonderful results were obtained by Ehrlich, which throw a powerful light on the production of immunity. As these bodies are much less active when taken into the stomach, he proceeded to feed white mice on a diet into which one or other of them entered, and he found that after this dietary had been taken for a time, such a change had developed in the reaction of the animal towards abrin and ricin respectively, that they might be administered in toxic quantities, which would have pròved fatal to a great number of unprotected animals, without the least ill effect being produced.

The animal fed on abrin became immune towards abrin, that fed on ricin towards ricin, but the immunity was not interchangeable; it was a case of a life insurance effected against a single disease.

But the interest of the work does not close here. The question arose, are the conditions developed in an animal by a diet containing such toxalbumins, which render the recipient itself strongly resistant towards that poison when inoculated, capable of transmission to the progeny of such an animal?

Again, Ehrlich obtained experimentally an affirmative answer, though he recognised the fact that the protective influence extended from the parent to the young mice was not one of long duration.

You will readily see that such results, apart from their bearing upon treatment, may possibly be found to explain why certain medicinal substances, which contain principles of a similar nature to those just spoken of, may be modified in their effect by their previous employment upon the same individual, and in fact the question of idiosyncrasy towards the action of drugs may be closely bound up with it.

As you are aware, the recent tendency has been to purge the Pharmacopœia of many bodies of animal origin which had justly come to be considered as effete and unworthy of a recognised position; but now the peculiar and invaluable advance which has recently been made is precisely in the direction of introducing animal products into practice.

Many of these bodies are, however, only now undergoing their first application to human treatment, but from what is already ascertained regarding them, we look very confidently towards their success in the future.

In the treatment of myxœdema by thyroid extract and other substitutional proceedings, wonderful advance has been made; but it is in dealing with the class of diseases which are infective in character that this progress is most notable.

The question may be roughly stated as consisting ultimately in the destruction or limitation of growth of disease-producing micro-organisms and their toxic products, or else by a process of immunisation, rendering their invasion impossible.

I will not risk wearying you by doing more than enumerating some of the means which have been used with the object of creating immunity in effecting a cure. The injection of blood serum of an animal which is by nature resistant to a given infective disorder may increase the resistance of a second animal which is markedly liable to suffer from that disorder. Thus, serum of horses which have had glanders is, to a large extent, according to one observer, protective to twenty others threatened by the disease. This increased resistance has been found, in one or two cases, to go so far as to merit the name of immunity, but in most cases the imparted influence is to a much more limited extent. Thus, the serum of dogs which are naturally resistant towards tubercle affords practically no protection against the disorder. If, however, as has been clearly shown by Klemporer, the resistant animal is previously inoculated with the microbes proper to the disease, the resistance conferred by its serum becomes enormously increased.

Thus, fowls which are very resistant by nature to the tetanus bacillus become even more so when inoculated with it, and the serum of their blood then confers immunity upon rabbits, which are highly sensitive towards this pathogenic microbe.

Just, however, as there is no immunity produced by one toxalbumin, such as ricin, towards another, so we have no evidence that the animal protected against tetanus acquires any increased resistance towards tuberculosis or anthrax.

But you will recollect the fact of a transmitted resistance towards ricin or abrin, and we find that there is evidence of such transmission to the products of animals inoculated with microbic poisons.

Klemporer has shown that the yolk of eggs laid by fowls which have had their resistance towards tetanus increased in the manner just described acquire the property of immunising a rabbit towards the disease. Further, the milk of female mammals may become modified by a similar process, so as to cause protection.

The fundamental researches of the late Dr. Wooldridge and others in this country have contributed much to indicate a method for mitigating the virulency of microbic poisons by cultivations made outside the body.

These brilliant results, which were amongst the last contributions of their talented originator to science, have been developed in recent days by other hands, as has been shown by the publication of some remarkable researches by Brieger and Kitasato abroad, and Hankin in this country. The former observers, suspecting that certain glandular organs possessed a destructive influence towards microbic poisons, prepared a special cultivating broth, into which extract of the thymus gland entered as the chief constituent. They found that the micro-organisms of diphtheria, of tetanus, of anthrax, of erysipelas, and of several other diseases were deprived of their peculiar virulency by the destruction of the various poisons they produced. And this is the important point they further established, that these cultures were capable of employment as vaccines, so that they could be directed to the procuring of immunity in animals.

What Pasteur has done in the treatment of prevention of rabies you already know, and we are at the present moment awaiting with the keenest interest news of the success of another vaccine, which will prove, if it fulfils the anticipations of those who have already seen something of its action, even a greater blessing to humanity. I refer to Haffkin's inoculation against cholera.

I think it is not impossible that in the course of time we may see the advent of another official list, edited and re-edited by a committee of experts, which will include those vaccines which we have been discussing, with the fullest details of their preparation and administration.

At present the sources of these bodies are few and often remote, and the busy practitioner is either unable to obtain vaccines, or he may feel himself scarcely justified in attempting to prosecute all the treatment they might afford. Under such circumstances the operation of such an institute as that of preventive medicine in London, and the foundation of others in such great centres as Edinburgh and Dublin, is most important.

Many centuries have not run their course since the energy of those who sought after great cures was focussed upon procuring the mysterious Bezoar stone, or the horn of the Unicorn—the more impossible of attainment—and the greater were the attributed virtues.

A spirit of unbounded credulity permitted the belief to our ancestors that the most deadly disorders would submit themselves to the influence of remedies the very existence of which, in many cases, was impossible and mythical.

The dark age of credulity passed, and then, and up to a comparatively few years ago, before science came to the aid, there was a period of justified incredulity. How widely different in our present time.

The conflict with diseases, which within the memory of some of us were well nigh unassailable, is being prosecuted, aided by weapons of temper and precision, with a vigour and understanding to the ultimate success of which it is difficult to predict a limit.

At the termination of this century of unexampled progress in manifold fields of human interest and knowledge, the healing art, fostered by tributaries from so many sources, cannot be charged with having lagged behind.

We have not yet seen the highest development of which it is capable, but we have seen it fully accorded a position of power and capacity for good, such as has never been yielded it before.

From this position it can never recede, but it will rather go on, I firmly believe, from strength to strength.

Well, gentlemen, I have touched very lightly upon a few points which might serve to illustrate some of the directions in which the healing art has been showing signs of vitality of late years. Let me express, again, my firm belief that for the success of curative medicine the contact between the minds of those employed in various departments, whether of production or use, is not only advisable, but essential. Let every part of the foundation be laid truly and firmly, and the structure ultimately raised upon it will stand small risk of overthrow.

Permit me, in conclusion, to wish you a successful and profitable session's work for your Branch, the proceedings of which will always have a keen interest for me.

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Mr. J. B. Stephenson, Chairman of the Board of Examiners for Scotland, said he had much pleasure in moving that they accord a very hearty vote of thanks to Professor Cash. He believed that was the second address he had delivered that day, having given his ordinary class lecture in Aberdeen that morning, and then travelled all the way to Edinburgh to address them that night. In that they had at once a measure of his goodwill to them and of their indebtedness to him. He had to congratulate the meeting on the admirable address to which they had just listened. In fact he thought they had been singularly fortunate in having addresses in successive years from men of the highest authority in their several departments. This address would of course be published in the Journal, and would be read with much interest by the very wide and select circle to whom it would thus become accessible. The address dealt with matters of very great importance. Within the last few years many deadly blows had been dealt at the system of ignorant empiricism, which characterised to so large an extent the treatment of disease. Nowadays the constitutional structure and physiological action of remedies had been so thoroughly investigated that it was possible to predicate the action of any remedy if its chemical constitution was known. As they all knew, the practice of therapeutics was now conducted on thoroughly scientific lines. This gave rise to a whole host of new synthetic remedies, and for the moment it seemed doubtful where all this was going to land them. There could be no doubt, however, that the lines now being followed were the right ones. He had to congratulate Professor Cash on his felicitous choice of a subject and the appropriate way in which he had handled it. The address was one that he could only commend to their highest approbation.

Dr. Stockman, in seconding the vote of thanks, said the address opened up to them the fairyland of medicine. In listening to Professor Cash one was tempted to let the imagination run riot and leave behind them the dry details of physical diagnosis. By the simple administration of a hypodermic injection or a gelatin capsule the disease would be cured, which at present would take six or seven weeks of treatment. They would observe that Professor Cash took an optimistic view, and he had to confess that in that respect he entirely agreed with him. In pursuing this line of research they were destined now and again to meet with a sad shock. That had occurred in the case of Koch's remedy for tuberculosis, which it must be admitted had proved a failure, but nevertheless it was an attempt in the right direction. More comfort and encouragement was to be got from their experience in the use of thyroid juice, which was capable of curing certain diseases from which a few years ago patients were doomed to die without being able to do anything for them beyond nursing. Now they found that a person suffering from myxœdema could, by the regular taking of a small portion of thyroid gland, live a comparatively happy and useful life. Another encouraging illustration was Pasteur's researches on the nature and treatment of rabies. Notwithstanding some opposition, in which he was sorry to say people in this country were prominent, his methods and treatment were being adopted all over the world. With regard to Professor Cash's proposal to cure cholera by disinfection of the intestinal canal, he would be inclined rather to trust to the excellent services of their medical officers of health. In regard to tuberculosis also, while it was true that certain drugs might do good, it was more likely to be successfully combated and extinguished by the preventive method, which would involve the expenditure of a large sum of money for a period of probably thirty years. Fifty years hence he believed they would have as little cause to fear tuberculosis in this country as they had to fear cholera at the present time.

Dr. Church said that as a general practitioner he had learned much from the address, and the additional light he had received would give him greater confidence in the use of some of the remedies referred to. There was one point by which he had been particularly struck, namely, the large quantities, amounting to several ounces, in which $\beta$-naphthol could be safely administered. He had recently found great advantage from its use in some cases of typhoid, but had always been in doubt and uncertainty as to the quantity that could be safely given. He would now feel confidence in prescribing it freely, and for a considerable period. In the case of sulphonal also, in regard to the toxic effects which followed its use with some patients, Professor Cash had pointed out how to retain its useful properties, and at the same time eliminate those which are deleterious. In his references to the organic extracts, Dr. Cash had introduced them to a new subject of great interest at the present time, and one which brought them into the sphere of the wonderful and the mystic.

Dr. Tillie said he had to congratulate Dr. Cash on the happy lines on which he had addressed them. His address was like an intellectual comet flashing light over the whole range of modern medicine. The prospect indicated a happy day for the pharmacist when his time would be taken up making thyroid extract and the various vaccines in that mysterious place called the back shop. He would also be under the necessity of studying bacteriology. The only point on which he would make a remark was with regard to the use of $\beta$-naphthol. He had recently had an opportunity of trying it in several cases of typhoid, and had been struck by the amount of gastric irritation which it produced with some patients. It might be that this was due to some idiosyncrasy on the part of the patient. He had given it in doses of 2 grains every two hours to act as a disinfectant of the intestinal canal, but it gave rise to vomiting, and consequently had little or no effect for the purpose in view. After a time, however, it seemed to establish tolerance, and then there was no difficulty.

The motion was carried with acclamation, and the Chairman formally conveyed to Professor Cash the thanks of the meeting.

Professor Cash, in reply, said it was a great privilege and pleasure to him to be there to meet old friends whom he knew when resident in Edinburgh, and also new friends with whom he had many common objects in which they could work together in the study of those great subjects to which he had been alluding. Dr. Stockman had said he had introduced them to the fairyland of medicine. That was so, but it was a realisable fairyland and no Utopia. If by the use of thyroid extract they could bring a patient out of a state of hopelessness and misery into a condition of comparative good health and comfort, as they could do in cases of myxœdema, that was fairyland to the patient. Again, when a person had been bitten by a rabid dog, and after undergoing Pasteur's treatment found his health as good as ever, that also was fairyland to the person who had been bitten. There could be no doubt that along these lines of research they opened the way to an indefinite power of combating disease, and in working together in this direction they were forwarding the time when there would be no disease and no patients. It was unnecessary to say more. He had to thank the meeting for the kind reception they had given him, and the Chairman for the complete arrangements he had made, so that everything connected with his visit should be made easy and pleasant.

The Chairman then directed attention to a portrait of the late Daniel Hanbury, which had been hung on the wall, and read a letter from his brother, Mr. Thomas Hanbury, of La Mortala, Italy, by whom the portrait had been presented. The Chairman said he would write to Mr. Hanbury and say that they highly appreciated his kindness, and would treasure the picture as a memorial of one whose name was well known and highly honoured among Scottish pharmacists.

The Assistant Secretary then drew attention to some recent donations to the Museum. These included a specimen of the entire fruit of *Cocos nucifera*, sent by Mr. James Jack, F.L.S., Arbroath, and a collection of specimens from the Museum, Bloomsbury Square, London. He also directed attention to a living specimen of the scarlet creeper, *Tropæolum speciosum*, sent by Mr. W. M. Smith, Aberchirder. The specimen showed the entire plant so much fasciated that the stem and branches appeared like thin, broad green ribbons, with the leaves and flowers clustered upon them.

On the motion of the Chairman, votes of thanks were awarded to donors of specimens.

The meeting then closed.

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

The Annual Conversazione was held at the Portman Rooms on Thursday, 14th inst. The proceedings commenced with an exhibition of microscopes, microscopical slides, and accessories, lent by several firms and gentlemen; this was followed by a concert, and at the termination of this lengthy part of the programme dancing commenced, and was indulged in until far into the next day. At supper, which took place in the middle of the dance programme, only one toast was proposed, by the President, namely, "The Ladies," and this was drunk amidst much cheering. Mr. Carteighe, in response to repeated calls, made a short speech. The exhibits were arranged by Mr. E. H. Gane, and the concert was conducted by Mr. H. H. Robins, but the post of M.C. of the dance was as usual very ably filled by Mr. T. C. W. Martin.

# Provincial Transactions.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The usual fortnightly meeting was held on the 16th inst., Mr. Frank Walker, President, in the chair. There were several new members elected. Before proceeding to the chief business of the evening, the President remarked that, after allowing the B.P.C. Formulary cod liver oil emulsion to stand a day or two, he had sometimes observed about 2 per cent. of the water to separate from the emulsion. Other members had had the same experience, while some had not observed it. Mr. Mitchell drew attention to a very weak solution of ext. glycyrrhiz. liq. in water, which had developed a strong odour of $H_2S$. It was suggested that this might be caused by the absorption of sulphates from the earth or by sulphates in the water. Mr. Edwin Williams then read a paper on the "Carbo-Hydrates." He described in detail the various divisions of the carbohydrates into pentoses, hexoses or glucoses, amyloses, and saccharoses, and stated that owing to the recent researches of Emil Fischer and others the theory in regard to the nature of these interesting compounds had been materially altered. Having shown the formulæ and tests for the starches, sugars, etc., he mentioned Fischer's discovery of the action of phenylhydrazin on lævulose and dextrose. This substance produces crystalline substances capable of being purified and identified, and of proving that lævulose is a ketone and dextrose an aldehyde. The insight thus gained into their constitution has led to successful attempts to synthesise these bodies; and Fischer has shown that it is also possible to build up artificial sugars, which have not yet been recognised in nature, containing as many as nine carbon atoms, *e.g.*, mannononose, $C_9H_{18}O_9$. Mr. Williams pointed out that the empirical formula for starch was $C_6H_{10}O_5$, but, to express the atomic ratio of its constituents as deduced by the most careful analysis, its molecule probably included many such groups, certainly not less than three, as $C_{18}H_{30}O_{15}$, otherwise it would be difficult to explain the production of maltose, $C_{12}H_{22}O_{11}$, and dextrin, $C_6H_{10}O_5$, from it by the action of diastase. Tollens regards starch as $C_{30}H_{50}O_{25}$; O'Sullivan as $C_{72}H_{120}O_{60}$, and Brown and Heron say it is probably $C_{120}H_{200}O_{100}$. Having described cellulose, its compounds and reactions, Mr. Williams concluded by advising his hearers to pursue the study of organic chemistry, as those who had passed the Minor had just reached the threshold of one of the most entrancing branches of science.

The President, and Messrs. Cowley, Burn, and Mitchell took part in the discussion which followed. The paper was well illustrated by microscope slides and blackboard equations.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

At a meeting, held on November 16, the President, Mr. Alderman Deck, in the chair, with a good attendance of members, some "Dispensing Notes" were read by Messrs. C. Saddison and R. Sturton.

# Parliamentary and Law Proceedings.

### Quinine and Cinchona in India.

In the House of Commons, on Monday,

Mr. Caine asked the Under-Secretary of State for India what quantity of cinchona in the bulk of all preparations had been sold by the superintendent of the Botanic Gardens, Calcutta, each year from 1886 to 1892; and what had been the average price for the year.

Mr. G. Russell: I shall be glad to hand my hon. friend a detailed statement for the seven years. In 1892-93, 5520 lbs. of quinine and 3650 lbs. of cinchona febrifuge were sold from the factory, near Darjeeling, to the medical department and to the public at a price of one rupee an ounce for quinine and ten annas an ounce for cinchona febrifuge.—*Times.*

### Proceedings under the Pharmacy Act.

#### SALE OF POISONS BY AN UNREGISTERED PERSON AT BOLTON.

At the Bolton County Court, on Wednesday, before Judge Jones, an action by the Pharmaceutical Society of Great Britain was heard, the case being one in which James Vickers, of Farnworth, near Bolton, was sued for selling poisons, he not being a qualified or registered person under the Act.

Mr. T. R. Grey, barrister, London, instructed by Messrs. Flux and Son, London, prosecuted, and the defendant was represented by Mr. M. Fielding, of Bolton.

Mr. Grey stated that the defendant was sued for two penalties for selling poisons contrary to the Pharmacy Act, 1868. He was employed as an assistant at "Berry's Drug Stores, Limited," 117, Market Street, Farnworth. There was no registered person under the Act in charge of these stores, and yet the most deadly poisons were sold. The Act under which they were suing was the Act for regulating the sale of poisons, and also amending the Pharmacy Act, 1852, 31 and 32 Victoria, chap. 121. Section 1 specified that "it shall be unlawful for any person to sell or keep open shop for the retailing, dispensing, or compounding of poisons, etc., unless such person shall be a pharmaceutical chemist and registered under the Act." Section 13 specified that "the absence of the name of any person from the printed register shall be evidence until the contrary shall be made to appear that such person is not registered according to the provisions of the Pharmacy Act." Section 15 was the principal section so far as it related to the present case. This section set forth "that any person who shall sell or keep open shop for retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist, not being a duly registered pharmaceutical chemist, or chemist and druggist, or who shall trade, use, or exhibit the name or title "pharmaceutical chemist," "pharmaceutist," or "pharmacist," not being a pharmaceutical chemist, or shall fail to conform to the regulations as to the keeping or selling of poisons made in pursuance of this Act, or who shall compound any medicines of the British Pharmacopœia, except according to the formularies of the said Pharmacopœia, shall for every such offence be liable to pay a penalty of £5." Before proceeding to the facts of the case, he wished to call his Honour's attention to the case of the "Pharmaceutical Society *v.* Wheeldon" (Queen's Bench Division), which was a case on all fours with the present one. In that case it was held "that a chemist's assistant who, in the absence of his master, sells a preparation containing poison is liable, notwithstanding that he effects such sale on behalf of his master, and that such master is duly registered." In the present case there was the additional fact that the master was not registered. It was important that his Honour should be in possession of the views of the judge in the above case, and for this purpose he quoted the remarks of Mr. Justice Hawkins in giving judgment. His Lordship said that nothing could be clearer than that the object of the Act was, beyond all other considerations, to provide for the safety of the public, and to guard, as far as possible, all members of the community from the disastrous consequences so frequently arising from the sale of poisons by persons inadequately acquainted with their baneful properties. The whole object of the Act would be frittered away, and the Act itself become a dead letter, were it to be declared that an unqualified assistant could lawfully, and with impunity, sell any of the poisons to which the Act applied, unless upon each occasion of such sale he acted under the personal superintendence of a qualified employer or of a qualified assistant of such an employer. By such superintendence they meant not mere presence in the shop or room where the sale took place, but actual personal supervision, so that every individual sale should be so guarded round by these precautions prescribed by the Act, that the safety of every member of the public might be provided for, as far as the law could accomplish that object. In the present instance the poison which was sold was tincture of opium, commonly called laudanum, a most deadly poison, especially to infants, and the evidence showed that it was possible for anyone to obtain poisons at the drug stores where defendant was employed, and the case was one in which it was of the utmost importance that a stop should be put to the practice.

Thomas Morton, Moss Lane, Pendlebury, was then called. He said that he visited the shop in question on September 16, and asked for a pennyworth of soap liniment and a pennyworth of laudanum. These were supplied to him by the defendant Vickers. He again visited the shop on September 19, and asked for a similar quantity of soap liniment and laudanum, which was again supplied by Vickers. Witness kept them secure from interference in his house until he subsequently saw Mr. Moon, a clerk employed by the Pharmaceutical Society, to whom he handed both bottles.

Cross-examined: It was Mr. Moon who asked him to buy the stuff. He did not get anything for his trouble. He swore that it was Vickers who served him, and also that the bottles had not been tampered with. When making the purchase he told Vickers that he wanted the stuff for his back, which was bad. He had been told to say this by Mr. Moon, but it was untrue, as his back was not bad.

Mr. Moon was next called. He said he received the two bottles produced from the last witness on October 23. He sealed them and retained possession of them until Saturday last, when he handed them to the analyst.

Cross-examined: It was not true that he had told Morton to say that his back was bad, but he had suggested to him that the mixture was good for rheumatism or pains in the back. Morton's statement that he received nothing for his services was also untrue, as witness paid him 5*s.* for each purchase.

Ernest John Eastes, analyst, London, spoke to receiving the two bottles from the last witness. They were sealed when he received them. Both bottles contained soap liniment and tincture of opium, which was dangerous to life.

Cross-examined: There would be 20 or 30 per cent. of laudanum in the bottles.

Mr. Fielding admitted that defendant's name was not in the Register. Proceeding to submit his defence, he said there always had been a registered chemist on the premises, but, unfortunately, at the time Morton visited the shop this registered chemist had left. He submitted that the inaccuracies proved in Morton's evidence were sufficient to cast suspicion on his whole conduct in the case. He told a deliberate lie about the pain in his back, and also with regard to being paid for his services. He (Mr. Fielding) admitted that unqualified persons should not mix deadly drugs, and the Pharmaceutical Society was quite right in taking action; but the present case was an exceptional one, inasmuch as a grown up man went to the shop and said the laudanum was for his back; and also seeing that the bottles were alleged to have been in the possession of Morton several weeks, and not been tampered with. He submitted that it was quite possible and even probable that they had been tampered with, and that the poison which was in the bottles at the time they were analysed had been purchased elsewhere. He contended that the whole case crumbled down after Morton's untruthful story. With reference to Vickers, he was a young man of 19 years of age, and only earning 17*s.* per week. He complimented the Pharmaceutical Society for their vigilance, but submitted that under the circumstances the defendant was entitled to a verdict.

The Judge said a good deal seemed to be made by Mr. Fielding of the untruthfulness of the witness Morton, but under the circumstances, and seeing that Morton was performing an unpleasant duty, and naturally acting as a spy, too much stress ought not to be laid upon that point. He might have told a falsehood, but that was for the purpose of carrying out the object of his unpleasant duty. As to his being paid for his services, the Society's object was to protect the public, and, therefore, no one could blame the Society for the steps it took, so long as those steps were honest, in endeavouring to stop the illicit sale of poisons by persons who were not authorised to sell them. They could not expect people to assist them in obtaining information against parties committing a breach of the statute unless they gave them some consideration for their trouble. There was no evidence to disprove that Vickers supplied the poison on both occasions, or that it was ever interfered with after being purchased until analysed in London. Therefore there would be a verdict for the plaintiff Society for the full amount of the penalty in each case.

Mr. Fielding asked for payment by instalments on the ground of his client's poor circumstances.

This was opposed by Mr. Grey, who also asked for counsel's fee.

His Honour made the order payable forthwith, together with counsel's fee and costs.

### POISONING BY CARBOLIC ACID.

An inquest was held by Dr. F. Hardman, Coroner for Sandwich, on Saturday, November 4, touching the death of Esther Turvill, who poisoned herself with carbolic acid the previous evening. The deceased was sixty-four years of age, and, according to the evidence of her husband, she had been ailing for some time.

The jury returned a verdict of "Suicide whilst of unsound mind," and added the following rider:—"That in their opinion the existing law was deficient in not imposing any adequate restrictions upon the sale of a poison so cheap and deadly as carbolic acid."—*Kentish Express.*

### EXPLOSION OF COMPRESSED GAS CYLINDERS.

At the inquest in connection with the case referred to last week (*ante*, p. 417), the evidence given showed that the cylinders were regularly sent all over the country charged with gases, and were in no way regarded as dangerous goods. It was, however, stated that the metal of which the cylinder in question was made was too brittle, and had not been annealed. The jury returned a verdict of "Accidental death, from the bursting of a cylinder made of unsuitable material," and recommended that in future all such cylinders should be protected by being packed in cases or otherwise.—*Times.*

### PROSECUTION UNDER THE FOOD AND DRUGS ACT.

#### THE COMPOSITION OF SPIRITS OF NITRE.

On Monday, November 20, at Ruthin Police Court, before the Rev. the Warden and a full bench, Howell Price, grocer, Llandegla Village, was charged with selling adulterated spirits of nitre. The case was opened a fortnight ago, and adjourned for the attendance of scientific witnesses—Mr. Lowe, county analyst, and Mr. Conroy, director of the laboratory of Messrs. Evans and Co., manufacturing pharmaceutical chemists, Liverpool. The defence was that the household article called spirits of nitre was a distinct product from spirits of nitrous ether as given in the British Pharmacopœia, the former containing about half the active principle or nitrous ether that was required by the Pharmacopœia. It would be injurious to the country people who consumed the spirits of nitre, which was made in the proportion of five to one of spirits of nitrous ether by Messrs. Evans, if they were supplied with the Pharmacopœia preparation. The prosecution affirmed that the drug popularly known as sweet spirits of nitre was the same as that called spirits of nitrous ether in the Pharmacopœia, and the magistrates took this view of the matter, and fined the defendant 1*s.* and costs, remarking that the penalty was a light one, as it was only a test case. It is stated the case may be carried to a higher court.—*Liverpool Mercury.*

### POISONING BY CARBOLIC ACID.

In the House of Commons, on Thursday,

Mr. Macdona was to have asked the President of the Local Government Board if he was aware that since February, 1892, to November, 1893, there had been 230 deaths due to the taking of carbolic acid, 174 of which were suicidal, and 56 accidental; whether, in view of this alarming increase of suicides from the fact of carbolic acid being sold in retail so cheaply, the

Government would place carbolic acid under the Pharmacy Act, and only allow it to be sold by chemists, in such small quantities as is the case with arsenic and prussic acid, etc., so that there might be greater restrictions placed upon its sale in small quantities; whether, with a view of bringing public attention to bear upon this matter, he would instruct coroners in certifying the cause of suicides to certify the name of the poison which caused the suicidal or accidental death in each case; and, whether he would order a return of the number of deaths caused by carbolic acid during the last five years to be placed upon the table of the House.

Up to the time of going to press, however, the question had not been asked.

## Obituary.

### ROBERT HIGGINS DAVIES.

By the death of Mr. Davies, at Bournemouth, on Thursday, November 16, at the early age of forty-two, and after a somewhat prolonged illness, the Pharmaceutical Society has lost one of its most able and active members just at the time when it might have been hoped that the established success of his career would have given him increased opportunities of usefulness. Mr. Davies' early home was at Newport, Monmouthshire, where his father was a well-known man, and he received his early education at the Wesley College, Taunton, and was afterwards apprenticed to the late Mr. Edwards, at Dartford, Kent. In 1871 he gained a Jacob Bell scholarship, coming first on the list in a year when three junior Bell scholars were elected, and at the end of the session, after a year of "hard living and high thinking," he gained two of the three silver Council medals that were given in those days, and was not far behind the winner of the third. He had passed the Minor examination before taking the Bell scholarship, but he did not offer himself for the Major until some years afterwards. During his student time, brief as it was and crowded with regular work, he was the author of a paper on the sulphite of magnesium, which was published in the *Pharmaceutical Journal*. After completing his course of work in the Society's School, Mr. Davies accepted an appointment with a leading firm in Dublin, but about a year afterwards was recalled to London, and succeeded Mr. John Moss as Demonstrator in the Society's Laboratories. Subsequently he was elected Assistant Secretary to the Pharmaceutical Conference. On being appointed Public Analyst for the Hammersmith district, he resigned his position as Demonstrator; and, later, he was selected to take charge of the manufacturing department of the Apothecaries' Company. In the course of his too brief career he served on the Councils of the Institute of Chemistry and of the Pharmaceutical Conference, acting also as Treasurer to the latter body, whilst at the Nottingham meeting he was elected a Vice-President. He was Secretary of the Society of Public Analysts, and for some time past he has served the Society as a member of the English Board of Examiners. He will also be remembered as the author of various papers in the Journal and elsewhere on several subjects.

Notice has also been received of the death of the following:—

On the 10th of November, Thomas Howe, Chemist and Druggist, Tideswell. (Aged 63 years).

On the 12th of November, Wm. Dykes Meredith, Chemist and Druggist, London. (Aged 70 years).

On the 16th of November, John Frederic Townsend, Chemist and Druggist, Bristol. (Aged 25 years). Mr. Townsend was the youngest son of Mr. Charles Townsend, M.P., Member of the Pharmaceutical Society.

On the 20th of November, John Tully, Chemist and Druggist, East Grinstead, Sussex. (Aged 66 years). Mr. Tully had been a Member of the Pharmaceutical Society since 1871, and Local Secretary for East Grinstead since 1886.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### DETECTION OF ESERINE.

Monsieur,—Je viens de lire dans le No. du 30 Septembre du *Pharmaceutical Journal and Transactions*, p. 280, une lettre de M. T. B. Nagelvoort dans laquelle il pretend voir de l'analogie entre la couleur verte obtenue dans ma reaction de l'éserine (*Comptes rendus*, t. cxvii., p. 330, et *Bulletin de la Société Chimique de Paris*, 3rd serie, t. ix., p. 753-754) et quelques autres, produites par l'action de la chaux et des alcalis. Dans ma note je m'ai rapporté brièvement à ces reactions, dejà connues, de l'éserine et qui sont decrites, entre autres livres, dans le magnifique traité du Dr. Kobert (*Lehrbuch der Intoxikationen*, p. 649, 1893) et dans la thése de Brasche citée par moi. Ma reaction ne se confond en aucune maniere avec les precedents; ni les caractères de la matiere verte se rapprochent de ceux des matieres colorantes deja obtenues avec le meme alcaloide au moyen de reactifs divers. En ce qui concerne la sensibilité de ma reaction, elle doit etre placeé, comme je l'ai constaté, parmi les plus sensibles.

*Porto.* A. J. FERREIRA DA SILVA,
*Prof. à l'Ecole Polytechnique de Porto, etc.*

### THE TEST FOR THE PRESENCE OF ARSENIC IN BISMUTH AND ANTIMONY SALTS IN THE RECENT EDITION OF THE UNITED STATES PHARMACOPŒIA.

Sir,—A modification of Bettendorf's test for the detection of arsenic has been generally adopted in the new edition of the United States Pharmacopœia. The original test is a most useful one, and, as usually applied, consists of the addition of a solution of stannous chloride in hydrochloric acid, but is now modified in the above work by the presence of metallic tin, which in the case of the salts of bismuth and antimony appears to be inadmissible. Under the head of bismuth subcarbonate we read as follows:—"If 1 gramme of the salt be ignited in a porcelain crucible, the residue when cold dissolved in 5 C.c. of stannous chloride T. S. (see list of reagents, Bettendorf's test for arsenic), and a small piece of pure tin foil added, no dark coloration or precipitate should be produced within fifteen minutes (limit of arsenic)." If this test be carried out with samples of the salts of bismuth and antimony—the salts and reagents having been previously proved to be free from arsenic—the following reaction takes place:—(1) Bismuth salts: The solution darkens immediately on the addition of metallic tin, and a heavy black precipitate rapidly forms. At the end of the prescribed time, if the mixture be well agitated, almost complete precipitation of the bismuth has taken place, so that if the liquid separated by filtration be poured into water, hardly any precipitation of oxysalt occurs. The black precipitate is found to consist wholly of bismuth. (2) Antimony salts: Under the same conditions, the precipitation is not so rapid as in the case of bismuth salts, nor so complete, but a black precipitate is formed, quite masking any indication of arsenic if present. If Bettendorf's reagent be applied, without metallic tin, to a solution of the chlorides of either metal in hydrochloric acid, the minutest quantity of arsenic may be detected. This is essentially the test of the German Pharmacopœia given under subnitrate of bismuth.

*Southwark, London.* JOHN C. UMNEY.

### THE "SUPPOSED SENNA."

Sir,—Referring to the letter of Mr. E. M. Holmes in your last issue respecting a "supposed senna," allow me to say that Mr. Holmes appears to have confused two distinct matters. The sample of "supposed senna" referred to by Professor Greenish is said to have been presented by Dr. Paul, and the leaves originally came from Tunis. These leaves appear to have constituted the so-called "senna." The specimens sent by me to the Society's Herbarium and to Kew came from Maranham, and were sent as jaborandi, and nothing else, although supposed by some eminent authorities to be coca, and even the leaves of *Pistacia lentiscus* (mastich), or *P. terebinthus*. The leaves in Liverpool have not been confounded with senna, being recognised from the first as a species of jaborandi.

*Liverpool.* THEO. H. WARDLEWORTH.

### REPLY TO DISPENSING QUERY.

Sir,—The dispensing query raised by "Major" in your issue of the 11th ult. raises an interesting point, namely, how far is a dispenser justified in departing from the strict letter of his prescription? "Major" asks practically what is meant by pil. opii? The Pharmacopœia states explicitly that pil. opii is a synonym for pil. saponis co., and therefore, under the circumstances mentioned, "Major" was undoubtedly justified in supplying that article. On the other hand, it would appear that some doctors, when ordering pil. opii, intend to give not the official preparation, but the amount of powdered opium ordered in the prescription. This lands us in a difficulty. If when pil. opii, gr. ½, is ordered we are, as your last week's correspondents all state, to dispense pulv. opii, gr. ½, what are we to do when pil. rhei, pil. scillæ, pil. conii, etc., are ordered? If we dispense the official preparations in one case, why not in the other also? It seems to me, sir, that your correspondents have not seen where their answers lead them. The case at issue is not, as Mr. Parker seems to think (vide *Pharm. Journ.*, Nov. 18, p. 420), on all fours with that of pil. quininæ, inasmuch as the latter is not an official article. The only correct course to pursue, to my mind, is to consult the prescriber, and ascertain definitely what is intended, and where this is not possible, to be on the safe side and dispense the official preparation. The pharmacist is not a thought reader, though some pharmacists seem to think they have to be, and his duty is to faithfully dispense his prescription according to the "nature, substance, and quality" of the article demanded.

*London.* E. H. GANE.

### NOTE ON PLASTERS.

Sir,—Having to make a plaster consisting of equal parts of emplastrum ferri and emplastrum plumbi, I found, after it had been spread in the usual way, that it was very brittle, and cracked in every direction when bent. Thinking that this should not be, I mixed together a quarter of an ounce of each of the two ingredients in a capsule on a water-bath, added about five grains of paraffinum molle, and stirred well with a glass rod. On spreading this mixture in the usual manner, a nice surface of plaster was obtained, which did not crack, and was very flexible even after three hours' time. Its adhesive properties were apparently not diminished or impaired. I send this note, thinking that such an addition would be useful to many of the plasters which, after keeping some time, are well known to become brittle.

*Birmingham.* W. ADAMS.

### DISPENSING DIFFICULTY.

Sir,—Referring to my question concerning "pil. opii," I was surprised to see that all the correspondents on the subject, except one, ignore the fact that pil. opii is a preparation official in the B.P., being a synonym for pil. saponis co., the latter title being used in order that the patient may not necessarily be made aware that he or she is taking opium (compare also tinct. camph. co.). When an official preparation is ordered I hardly think it is the duty of the pharmacist to "substitute," on the assumption that the physician does not intend what he actually orders. The titles and designations of the British Pharmacopœia are most explicit, and it is a slur on the prescriber to assume that he is ignorant of them. Where there is any room for doubt or any danger the prescriber should be consulted; but the dispenser oversteps his duties when he tampers with the prescription according to what he considers was really intended. The synonyms of the British Pharmacopœia are "by authority," and pharmacists should be the last to lay themselves open to blame by their ignorance of them.

*London.* MAJOR.

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*R. J. Bostock.*—In dispensing medicines from physicians' prescriptions, the exact quantity ordered should be sent, whether it exactly fills a pot or bottle of certain size or not. If, as you suggest, it is the "usual thing" to simply fill an ounce pot with ointment when an ounce of the latter is specified, the practice is not consistent with accuracy, since the bulk of equal weights of different ointments varies considerably. The dispenser's standard must be what the physician orders, not the capacity of the pots and bottles he uses. These are made to fixed sizes merely as a matter of general convenience, and this must frequently give way to special circumstances, elegant finish being always subservient to accuracy.

*Enquirer.*—We understand that the clause in the Pharmacy Act must be taken literally, and may point out that a case of poisoning has resulted from the use of a similar article quite recently. Regarding your question as to liability under the Sale of Food and Drugs Act, you had better take legal advice upon the point, if necessary.

*Wolborough.*—In the form in which the prescription is written, the powder should be supplied.

## NOTICES OF MEETINGS NEXT WEEK.

### WEDNESDAY, NOVEMBER 29.

*Brighton Junior Association of Pharmacy*, at 9 p.m.
Social and Musical Evening.

### THURSDAY, NOVEMBER 30.

*Chemists' Assistants' Association*, at 8.30 p.m.
Short Papers by Members.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Discussion on Pharmaceutical Ethics," introduced by Frank Walker.
"Cremation as a Sanitary Agent," by S. C. Sproat.
"Matico," by H. Roberts.

### SATURDAY, DECEMBER 2.

*Pharmaceutical Football Club v.* St. George's Hospital at Castle Hill, Ealing, at 8.15.
*Reserves v.* The Templars at Shepherd's Bush.

## BOOKS, ETC., RECEIVED.

THE OUT-DOOR WORLD, or Young Collector's Handbook. By W. FURNEAUX, F.R.G.S. With 16 coloured plates, and over 500 illustrations in the text. Pp. i.-xxviii., 1 to 411. London: Longmans and Co. 7s. 6d. From the Publishers.

SELECT TABLES FROM THE U.S. PHARMACOPŒIA (1890). Reprinted for ready reference in daily practice. Philadelphia: P. Blakiston, Son, and Company. From the Committee of Revision.

YEAR-BOOK OF PHARMACY FOR 1893. London: J. and A. Churchill. Pp. 1 to 470. From the Committee of Publication.

LABORATORY TEACHING. By CHARLES LONDON BLOXAM. Sixth Edition. London: J. and A. Churchill. Pp. i.-viii., 1 to 324. 6s. 6d. From the Publishers.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Allen, Durant, Fisher, Maxwell, Robb, Tschirch, Turner.

## "THE MONTH."

**Boron-Eisen.** This compound, described by H. N. Warren, is prepared by mixing solutions of borax and ferrous chloride, pressing the resulting white precipitate to free it from adhering water, and, after thoroughly drying, reducing it with an equivalent proportion of carbon in a plumbago crucible. In this way four to five per cent. of boron is said to enter into union with the iron, a compound being produced which breaks with the fracture of metallic manganese and possesses sufficient hardness to readily scratch glass. At the same time it is with difficulty soluble in acids, whilst its melting point approaches that of cast-iron. A more economical method of preparing the compound is to reduce ferric carbonate or oxide, mixed with boron oxide and charcoal. The average of several analyses is represented by the following figures:—Iron, 94·08 per cent.; boron, 4·02; combined carbon, 1·50; phosphorus, 0·09; sulphur, 0·31; silicon and manganese, traces (*Chem. News*, lxviii., 200).

**Galloparatoluide.** The preparation of gallanilide by acting upon tannin with aniline has suggested to P. Cazeneuve that by dealing with the homologues of the base he might be able to obtain those of gallanilide, by an analogous decomposition of the tannin of nut galls, but experiments proved that paratoluidine alone behaves in this respect in a similar manner to aniline. On heating paratoluidine with gallotannic acid and then treating with water acidulated with hydrochloric acid, a white crystalline product was obtained which melted at 211° (m. p. of gallanilide is 205°), was but slightly soluble in cold water, though very soluble in boiling water, and also soluble in alcohol and in ether. The composition of the substance showed that it corresponds to gallotoluide and galloparatoluide (*Comp. rend.*, cxvii., 633).

**Formenephone.** This is an instrument, described by E. Hardy, for use in the analysis of mixtures of two gases of different densities, by the application of sound vibrations. An experiment with this apparatus occupies but a few minutes. It consists of two organ pipes with bellows attached, one being enclosed in an air-tight covering containing pure air, whilst the other is supplied with the gaseous mixture to be tested. The pipes are of the same dimensions and give the same note when blown under identical conditions, but when the air in one of them is mixed with some foreign gas, that in the other remaining pure, the sound of the former is found to be modified in proportion to the amount of the added gas. Details are given of a number of experiments with mixtures of formene and air, and the instrument is said to be well suited for the determination of fire-damp in mines (*Comp. rend.*, cxvii., 573).

**Hypaphorine.** This is the name given to an alkaloid extracted by P. C. Plugge from the *Hypaphorus subumbrans*, Heskl. (Papilionaceæ), a tree found growing in Java. It forms colourless crystals which decompose without melting at 220°, and are readily soluble in water. Hypaphorine cannot be extracted from alkaline or acid solutions by ether, petroleum ether, benzol, or chloroform. It is dextro-rotatory, solutions of its salts are not precipitated by alkalies or alkaline carbonates, and it has been found to act as a poison to frogs (*Archiv für exp. Pathologie*, and *Répertoire*, [3], v., 507).

**Salts of a New Platinum Base.** W. J. Sell and T. H. Easterfield describe the salts of a new platinum-sulphurea base, $Pt(CSN_2H_4)_4(OH)_2$, which has not yet been isolated in the pure state. The chloride is formed by adding platinic chloride solution to a boiling solution of sulphurea in dilute hydrochloric acid. Then, on adding strong hydrochloric acid, in which the salt is very sparingly soluble, to the filtered solution, crystalline needles of the chloride, $Pt(CSN_2H_4)_4Cl_2$, are deposited. The sulphate, $Pt(CSN_2H_4)_4SO_4$, is precipitated in regular octahedra when dilute sulphuric acid is added to an aqueous solution of the chloride. The picrate, $Pt(CSN_2H_4)_4Pk_2$, is very sparingly soluble in cold water, and crystallises from hot water in golden-yellow iridescent needles (*Chem. News*, lxvii., 223).

**Macassar Oil.** A specimen of this oil, obtained from the seeds of *Schleichera Trijuga*, Willd. (Sapindaceæ), and sent from Mirzapoor, Hindostan, has been examined by R. Glenk, who describes it as a yellowish-white semi-solid substance, having a faint odour of bitter almonds, and a specific gravity of 0·942. It probably contains hydrocyanic acid, and its mildly acrid taste may be ascribed to partial rancidity. An acrid reaction was indicated with litmus paper, and the oil was completely liquefied at 28° C., congealing again at 10°. It was readily saponified by sodium hydrate, even at a low temperature, forming a white, hard soap. With nitrous acid it assumed an orange-red colour, and became viscid, but did not appear to solidify. Concentrated sulphuric acid acquired a reddish-brown colour on addition of the oil. Chloroform, ether, carbon bisulphide, benzol, benzine, and the fixed and volatile oils freely dissolve the oil, but alcohol only slightly affects it (*Amer. Journ. Pharm.*, lxv., 528).

**Effects of Fluorides on Yeast.** J. Effront states that the use of certain fluorides in distilleries is rapidly extending generally, and he gives the results of some experiments conducted to ascertain the action of these compounds upon the alcoholic ferment, sterilised malt extracts and pure yeasts being employed for the purpose. It was found that on cultivating yeast in a wort containing 200–300 Mgrm. of ammonium fluoride, its power of increasing by cell multiplication was sensibly weakened, the result varying according to the kind of yeast. After the yeasts had been thus accustomed to the presence of fluorides, however, a wort containing the above quantity of the salt served as a suitable culture medium for any kind of beer yeast. Again, by treating yeasts with gradually increasing quantities of fluorides, they acquired a fermenting power tenfold in excess of what they normally possessed (*Comp. rend.*, cxvii., 559).

**Lævolactic Ferment of the Pear.** A bacterial organism producing marked lævolactic fermentations of dextrose and mannitol was isolated by Dr. George Tate, in the course of observations on the nature of the micro-organisms which attack the ripe pear. The organism is anaërobic and characterised by forming two kinds of growth upon solid media—a white growth of moist appearance, consisting chiefly of rods and cocci, and a tough, tapioca-like growth, consisting of ascococci. By cultivation in glycerol fluids, or other media where no acid is formed by the organism, the ascoïd form of growth, which is apparently induced by unfavourable conditions of growth that favour spore formation, may be made to give rise solely to the rod and coccus forms. The ferment does not affect cane sugar nor bring about acid fermentation of glycerol. From 9 mols. of dextrose it produces alcohol, 2 mols., succinic acid, 1, lævolactic acid, 7 to 8, and acetic and formic acids in smaller and variable proportions. When the organism is grown in the ascoïd form, however, the lævolactic acid is slightly lessened in amount. From 9 mols. of mannitol are produced alcohol, 6, acetic acid, 1, formic acid, 2, lævolactic acid, 12 mols., together with less appreciable amounts of succinic acid. From 9 mols. of rhamnose are more slowly produced 4 mols. of inactive lactic acid, and 5 of acetic acid, alcohol being absent. After cultivation in rhamnose solutions, the organism loses none of its character as a lævolactic ferment of dextrose. Finally, it is noted that the products of bacterial fermentation depend in quantity and in character on the molecular constitution of the substance attacked, the study of the dextrose fermentations tending to indicate that the attack of the organisms is directed simultaneously against nine or other multiple number of molecules—that is, against a group of molecules—rather than against single molecules (*Journ. Chem. Soc.*, cclxxi., 1263).

**Perfume of the Violet.** F. Tiemann and P. Krüger have endeavoured during ten years to isolate the chemical principle to which the odour of fresh flowers of the violet and of orris rhizome is due. They now state that the odorous principle of orris is a ketone, $C_{13}H_{20}O$, which they name *irone*. It is an oil, freely soluble in alcohol, ether, chloroform, etc., and boils at 144°, under a pressure of 16 Mm. Its specific weight is 0·939 and index of refraction $n_D = 1·50113$. It is dextrorotatory, forms a crystalline oxime melting at 121°·5, and is transformed into a hydrocarbon, *irene*, $C_{13}H_{18}$, when acted upon by hydriodic acid. An isomeric ketone, *ionone*, $C_{13}H_{20}O$, having also a violet odour, can be obtained from citral. This body distils at 126°–128°, has a specific weight of 0·9351, index of refraction $n_D = 1·507$, and may be transformed into the hydrocarbon *ionene*, $C_{13}H_{18}$. The isomeric hydrocarbons, irene and ionene, yield on oxidation an identical product, ioniregene-tricarboxylic acid, $C_{13}H_{12}O_7$ (*Comp. rend.*, cxvii., 548).

**Determination of Essential Oils in Alcohol.** The presence of essential oils in solution in alcohol is determined qualitatively, by Bardy and Bérard, by adding to 1 C.c. of the alcohol, 25 C.c. of distilled water, then 1 C.c. of permanganate solution (1 Grm. per litre). If the colour does not alter appreciably only traces of oil are present. If, however, there is a decided change to maroon or yellow, then to 5 C.c. of the spirit add 30 to 35 C.c. of brine coloured with a little aniline violet. An oily layer of a violet tint may now rise to the surface, and in that case, by operating upon a larger quantity of the alcohol in a similar way, but without the aniline violet, an appreciable quantity of oil will be separated and its amount may then be determined. The essential oil remaining in solution in the alcohol may be determined quantitatively by a further process, which must also be employed in the case of specimens from which no oily layer separates. This method consists essentially in the separation of the oils by means of carbon bisulphide and their conversion by the action of sulphuric acid and sodium acetate into the acetates of higher alcohols, the amounts of which are then determined and will indicate the percentage of essential oil dissolved in the alcohol under examination (*Journ. de pharm. et de chim.*, [5], xxviii., 458).

**Sandal-wood Oil.** Referring to Cripps' proposed test for this oil (*Pharm. Journ.*, [3], xxiii., 462), Messrs. Schimmel state that they find it may be rendered somewhat more stringent by using 70 per cent. alcohol instead of 75 per cent., at a temperature of about 20° instead of 15°·5, but in the same proportion, viz., 1 to 5 parts by volume. They have never met with a sample of lower specific gravity than 0·975 in normal sandal-wood oil, and consider that that figure may be taken to indicate the lowest permissible specific gravity. H. Haensel, dealing with the same test, finds that the conditions can be still more precisely and strictly defined than they are by Cripps, especially in reference to the rotation of polarised light and solubility in dilute alcohol. He has found East Indian sandal-wood oil to be clearly soluble, even when the rectified spirit only contained 90 per cent. of alcohol by volume, and four volumes of it were mixed with one volume of distilled water. In these five volumes one volume of the East Indian sandal-wood oil dissolved quite clear. With respect to polarisation, he has recently again experimented with the fresh oil, and has determined that the portion of oil first passing over rotates more strongly to the left than the subsequent fraction, having a specific rotation of 50°·50 in a 200 Mm. tube, whilst that of the latter is 47°·90. The rotation to the left in an East Indian sandal-wood oil is therefore very marked.

**Maté.** Hermann Kunz-Krause has summarised the literature of maté (*Ilex Paraguayensis*), and examined the drug with the view of ascertaining whether ilixanthin (of *Ilex aquifolium*) or choline were present. He has determined the absence of ilixanthin but the presence of choline, and has shown further that the tannin in maté is identical with caffe-tannic acid, yielding the same decomposition products, viz., sugar and dioxycinnamic acid (caffeic acid), (*Archiv.*, 231, 613).

**Blay-hitam.** H. and C. G. Santesson have subjected the bark known as "blay-hitam," and used in the Malay Peninsula in the preparation of ipoh arrow poison, to a histological and chemical examination. From the structural characters of the bark and wood they conclude that the drug is derived from a species of *Strychnos*, which they were unable to determine. The chemical examination showed that the principal alkaloid present was brucine; strychnine could not be detected (*Archiv.*, 231, 591).

**Cristalline.** This is a kind of collodion in which the ether and alcohol are replaced by methylic alcohol as a solvent. It evaporates more slowly than ordinary collodion and forms a durable translucid pellicle, said to be imperceptible on the skin. It has been employed in combination with various medicaments in cases of skin disease, and readily dissolves pyrogallic and salicylic acids, chrysarobin, sublimate, etc. By the addition of castor oil an elastic cristalline may be obtained as in the case of collodion (*Sem. méd.* and *Répertoire*, [3], v., 497).

The Pharmaceutical Journal
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, DECEMBER 2, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## THE ADMINISTRATION OF THE PHARMACY ACT.

THE unusual demand made upon our space this week by the legal reports has been provided for, less on account of the intrinsic importance of the circumstances to which they relate, than as being illustrative of practices which have long furnished substantial grounds for complaint on the part of legally qualified chemists and druggists, and further as showing the steps now being taken by the Pharmaceutical Society to deal with those practices under the Pharmacy Act. In this respect the prosecutions instituted in Scotland are of especial interest as showing that the provisions of the Pharmacy Act are to a much greater extent capable of being applied in promoting public safety and suitable regulation of the business to which they relate than has hitherto been generally supposed. The enhanced importance of the Act for the attainment of those objects has been in great measure the result of recent constructions in cases where questions have been raised as to the scope of the Act and the sufficiency of its provisions to secure the main object which the Legislature had in view when it was passed. The belief in the necessity of adequate qualification on the part of the responsible proprietor of a pharmaceutical establishment was one of the fundamental principles upon which the Pharmaceutical Society was founded. The idea it conveys is a natural and a reasonable one. But it does not cover the entire field in which qualification is essential for the purposes of the Pharmacy Act, 1868. In the previous Act the supplementary requirement was provided for in accordance with the view of the Society that there should also be a qualification for assistants. But the original principle of proprietary qualification was to a great extent departed from in the Act of 1868, when the lower grade of qualification was made sufficient for selling or keeping open shop for retailing, dispensing, or compounding poisons, and consistently with the object of that Act, it thus became necessary that every individual engaged in that way should possess the qualification required by the Act in order to attain the object which it had in view.

The necessity of this individual qualification has been confirmed by judicial decisions in two opposite directions: first, by that given in regard to company trading, and, secondly, by that given in the WHEELDON case. It is upon that basis that ground is obtained for applying the Act not only to companies carrying on business as chemists and druggists, but also to the case of medical men keeping open shop in virtue of the exemption provided for in the 16th section of the Act and in the amending Act of 1869. If persons possessing a medical qualification choose to avail themselves of that exemption and to exercise their right to carry on the business of a chemist and druggist, it is only by reason of their individual qualification that they are in a position to do so. Their functions in that capacity cannot be vicariously exercised by their subordinates or employés unless the latter also possess the qualification required by the Act, or are equally exempt from it as their masters. This view of the intention and object of the Pharmacy Act has been fully confirmed by the decisions of Sheriff BIRNIE in the Glasgow cases, reported at page 447, and it may be confidently expected that further application of the Act in the same direction will eventually have the effect of doing away with an anomaly which has prevailed in Glasgow especially, and in some other parts of the country, to a scandalous extent. It is evident from the remarks made by Sheriff BIRNIE during the hearing of these cases that the significance of the evil resulting from this practice, which has been so common in Glasgow, was fully appreciated. The plea that apprentices must be taught the business of dispensing is utterly fallacious when it is extended to the dispensing of poisons, and if it were admitted it would be subversive of the object of the Pharmacy Act. Teaching is necessary, but not at the risk of public safety, and the restrictions of the Act must be conformed to by all who are not legally qualified under it.

The report of the bankruptcy proceedings at Birmingham, at page 459, furnishes an almost farcical demonstration of the mode in which the law of limited liability can be misapplied. The *Birmingham Daily Mail* remarks that the story of how ALBERT TIBBATTS floated himself into a limited liability company reads more like a page out of DICKENS than a matter-of-fact bankruptcy examination. As plain ALBERT TIBBATTS he could not carry on a chemist's business without the legal qualification, and that he had been unable to obtain. But as the Birmingham Drug Company he could defy the Pharmacy Act, so far as keeping open shop was concerned. Here, again, however, the necessity for the individual qualification of a seller of poison brought him within the scope of the law. According to his own account the business carried on by the Birmingham Drug Company appears to have been a miserably poor one, insufficient to support the cost of a duly qualified manager, and in the ordinary course, breach of the Pharmacy Act became inevitable. It is a painful and disagreeable duty to have recourse to legal prosecution in such cases; but it is none the less an imperative necessity that such steps should be taken. The system of company trading is extending so rapidly, to the detriment of registered chemists and druggists, that the only immediate hope of a remedy against it lies in the stringent enforcement of the Pharmacy Act in regard to the sale and dispensing of poisons. Whether the attempt to obtain further legislation, if possible or desirable, would be effectual, it is impossible to conjecture in the absence of any practical proposition having that object; but we may state that a representation of the case recently made to a prominent member of the House of Commons has elicited from him an expression of opinion that the system referred to should be put an end to, and an assurance that he will favourably consider any practical proposal submitted to him for securing that object. This is a matter which more or less concerns all registered chemists and druggists, and especially those in a small way of business. It should therefore operate as a strong inducement to concerted action of a more extended and thorough nature than has hitherto existed in the trade.

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## CHOLESTERIN FAT IN CHANCERY.

A patent case that has been tried last week, before Mr. Justice Romer, in the Chancery Division of the High Court of Justice, possesses some considerable interest for pharmacists, and we therefore propose to state the leading facts of the case, which are already matters of history. Our readers will remember that in the year 1886 the use of cholesterin fat was recommended by Professor Liebreich as a basis for ointments. The ground for that recommendation was the discovery that cholesterin fat is naturally secreted, not only by the sheep but by many other animals, and that it appears to serve a special purpose of lubricating and protecting feathers, wool, and hair much in the same manner that the waxy secretions of plants answer a similar purpose. This natural association of cholesterin fat with the skin afforded a strong argument in favour of the recommendation that cholesterin fat should be applied for pharmaceutical and medical purposes. Sheep's wool had long been known to be an abundant source of this material, and it was pointed out by Professor Liebreich that in ancient pharmacy it had already been used under the name of œsypus as an unguent and cosmetic.

As a consequence of Professor Liebreich's suggestion, the manufacture of cholesterin fat was speedily undertaken, and it was introduced into trade, under the name of "lanolin," as a patented preparation consisting of a mixture of the cholesterin fat, obtained from sheep's wool, with about 30 per cent. of water. Shortly afterwards this material was inserted among the articles of the official materia medica under the designation of adeps lanæ hydrosus, while it appears in the Austrian, Danish and Italian pharmacopœias as "lanolin." Wool fat itself was made an article of the materia medica under the name of adeps lanæ in the English and Russian pharmacopœias, and it has been included in the non-official pharmacopœia of Germany. Since that time hydrous wool fat has been introduced into the pharmacopœia of the United States. Several manufacturers have commenced the production of wool fat both here and abroad, and against one of them in this country proceedings have been taken by the proprietors of the lanolin patent for infringement of their rights as inventors of the process by which purified cholesterin fat or wool fat is manufactured by them. The specification of the patent sets forth that the sources from which purified wool fat is to be obtained are either the waste liquors in which wool has been washed for the purpose of cleansing it, or the material known as commercial wool fat. It also describes the special method of manufacture as consisting in the use of a centrifugal machine, or milk separator, in order to effect a separation of the emulsified cholesterin fat from the dirt with which it is mixed and from the soapy liquor in which both are suspended. As an alternative method of production, commercial wool fat is to be treated with alkali or soap, and the thin milky emulsion thus formed is to be subjected to separation by means of the centrifugal machine. The raw lanolin thus obtained is to be further purified by washing, or by solvents, and finally incorporated with about 30 per cent. of water to form the final product —lanolin.

It is the patent right in the use of these operations that is alleged to have been infringed by the manufacturers of the wool fat sold under the name of anaspalin by Messrs. J. Richardson and Co., of Leicester. The two points of invention relied upon by the plaintiffs are—the removal of free fat acids from the cholesterin fat by treatment with alkali, and the incorporation of water with the purified wool fat thus obtained. It may here be remarked that according to this latter claim anyone who mixes adeps lanæ with water would produce lanolin, and would thereby infringe the patent, even when making an ointment according to a physician's prescription.

Although œsypus has long since disappeared from the materia medica, together with many other articles of animal origin, the washing of wool in soapy water for cleansing it from fat and dirt has been continued. The washing liquor left after that operation was merely dirty water to be got rid of; but, as containing soap and the fat and impurities extracted from the wool, it was so dirty that before being discharged into a water course the fat and soap had to be separated. That was done by adding acid to the waste liquors, generally after they had accumulated in pits and undergone putrid fermentation, and in that way a waste product was obtained, consisting of the cholesterin fat mixed with free fat acids, resulting from decomposition of the soap which had been used for washing the wool. From the enormous quantity of wool used in textile industries the quantity of this waste product yielded by the washing liquors was very considerable, and it has been turned to account as cart grease or for greasing hides under the name of Yorkshire grease. It is a dark brown fat of obnoxious odour, and is the only form in which wool fat was met with in trade up to the time when the lanolin patent was granted.

The defendants in the action now referred to allege that in the manufacture of purified wool fat they do not make use of the processes claimed by the patentees. They state that they follow exactly the directions given by DIOSCORIDES 2,000 years ago, by washing wool in hot water, allowing the washings to remain at rest until the fat collects at the surface, skimming that off and washing it with water until sufficiently clean. As regards the incorporation of water with the purified cholesterin fat, it is contended on the one hand by the patentees that the product thus obtained was, at the date of the patent, "a hitherto unknown compound," while on the other hand the defendants claim that it is nothing more than the natural result of a property that was well known to be common to all kinds of fat, and has long been practically turned to account in the manufacture of cold cream. At the trial of the case a very large amount of more or less irrelevant matter was introduced, and in the examination and cross-examination of the witnesses there was considerable apparent and real conflict of testimony. But as judgment has been reserved it would be obviously improper to offer any comment upon the evidence given, or upon the merits of the questions in dispute, until a decision of the case shall have been arrived at.

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## POISONING BY CARBOLIC ACID.

IN the reply made by Sir WALTER FOSTER, in the House of Commons, to Mr. MACDONA'S question regarding deaths by carbolic acid poisoning (see page 459), he expressed the intention of the Local Government Board to bring the matter under the attention of the Pharmaceutical Society. Since this might seem to imply that the Society is in some way responsible for the fact that carbolic acid is an unscheduled poison and can freely be sold by anyone, without any restrictions whatever, it may be well to indicate what steps have been taken in the matter by the Council of the Society.

In February, 1882, the Council resolved tha carbolic acid ought to be deemed a poison with the meaning of Part 2 of the Schedule, and on the following day that resolution was forwarded to the Privy Council. The reply to this communication (see *Pharm. Journ.*, [3], xiii., 116) was to the effect that their lordships, after giving their careful consideration to the proposals contained in the resolution, were of opinion that it was not desirable to place restrictions on the sale of carbolic acid. Again, on February 10, 1886, the REGISTRAR, when sending to the Privy Council a resolution respecting nitro-glycerin, etc., wrote as follows:—"The Council has instructed me to direct the attention of the Privy Council to the number of cases of poisoning by carbolic acid, and to again suggest the desirability of placing this substance in Part 2 of the Schedule." No action having been taken by the Privy Council, the Council of the Society in October, 1888, again resolved that carbolic acid ought to be deemed a poison within the meaning of Part 2 of the Schedule. That resolution was forthwith sent to the Privy Council, and in the letter forwarding it, reference was made to the resolution of 1882. Beyond the official acknowledgment of the receipt of the letter, no reply was received. In June, 1890, the Privy Council forwarded to the Society a letter from a Coroner relating to poisoning by hydrochloric acid, and asked for observations thereon. A reply was sent to the effect that all sales of "acid poisons" should be, in the Council's opinion, subject to the conditions imposed by the Pharmacy Act on the sale of poisons. On February 5, 1891, the Privy Council was reminded of the above facts in an official letter from the PRESIDENT of the Pharmaceutical Society but, as on the two previous occasions, no attention was paid to the communication.

It should be clear, therefore, that the Council of the Pharmaceutical Society has fulfilled its duty in the matter, and that with regard to the unrestricted sale of this dangerous liquid the responsibility rests with the Privy Council, which, having had all the facts repeatedly placed before it, has yet persisted in refraining from compliance with the suggestions of the representatives of the Pharmaceutical Society. The only reason given for this inaction has been that the use of carbolic acid as a disinfectant, when epidemics were prevalent, might be to some extent interfered with; but considering the fact that the services of registered chemists and druggists are available in every part of Great Britain, whilst local authorities generally have adopted a system of free distribution of disinfectants in their respective districts, such a plea can hardly be seriously entertained.

### PHARMACISTS AND PHARMACOLOGISTS.

The highly instructive address delivered by Professor Cash to the North British Branch of the Pharmaceutical Society, and reported at length in last week's Journal, should afford much matter for reflection to such pharmacists as devote thoughtful consideration to the close relations subsisting between themselves and the medical profession, and to the proper limitation of the duties appertaining to them respectively. In pharmacology, of course, the pharmacist may be interested to as great an extent as the medical man, but, as clearly shown in the address, his special line of work is totally dissimilar to that of the latter. He must carefully study "the most advantageous way of utilising the drug and of preparing it in many forms for the exigencies of practice," thus affording invaluable aid to the pharmacologist and therapeutist in their endeavours to place the art of medicine upon a thoroughly scientific basis. A mere glance at the mass of facts embodied in the address should be sufficient to carry conviction to the minds of those inclined to doubt whether such a restriction would leave sufficient scope for the energies of active pharmacists, and it must be noted too that the restriction is but partial, being on one side only. Before the prescribed tasks can be performed efficiently there is a very wide field of knowledge to be covered and a careful and prolonged training to be undergone. Dr. Cash has well earned the thanks of the pharmaceutical and medical communities for dealing with his subject in so satisfactory a manner, and particularly for the expression of opinion, with which he concisely sums the whole matter up: "That for the success of curative medicine, the contact between the minds of those employed in various departments, whether of production or use, is not only advisable, but essential." The Executive of the North British Branch is also to be congratulated on the success attending the efforts made to open the session in a befitting manner, with an address admitting of such important practical application.

### THE TRADE IN COMPRESSED GASES.

We learn from the Secretary of Brin's Oxygen Company that in the course of a few days will be published a 'Handbook on the Use of Compressed Gases and Cylinders,' written by Mr. Kenneth S. Murray, the engineer and manager of the company. Though compressed gases do not in their nature come under the designation of explosives, they do so by reason of their condition, and it is highly desirable that the precautionary measures taken for preventing accident should be of such a nature as to entirely do away with all possible risk attending their transport, storage and use. We understand that this work will deal fully with these various matters.

### EVENING MEETING IN LONDON.

The next evening meeting of the Pharmaceutical Society will be held at 17, Bloomsbury Square, on Wednesday, December 13, at eight o'clock. A paper will then be read by Mr. N. H. Martin, F.L.S., Member of Council of the Society and President of the Pharmaceutical Conference, on "The International Pharmaceutical Congress at Chicago in 1893, with some Notes on American Pharmacy."

### RECENT PHARMACEUTICAL MEETINGS.

At a meeting of the Edinburgh and District Chemists' Trade Association, on Friday, November 24, the reply of the Pharmaceutical Council to the letter sent on September 30 last was considered and, after a lengthy discussion and a proposal by Mr. Boa that the Medicine Stamp Act should be abolished, it was resolved that the Association should agitate for an amendment of the Act. It was also decided to appoint a special committee to inquire into the sale of soluble blue, containing oxalic acid, by grocers. At the Edinburgh Chemists' Assistants' and Apprentices' Association, on Wednesday week, Mr. J. Rutherford Hill described a botanical ramble in Kent, and a paper on "The Pharmacy of Bromoform" was read by Mr. William Lyon. The Glasgow and West of Scotland Pharmaceutical Association, on Thursday week, received a communication on "Simple Urine Analysis," from Mr. Arthur McKellar.

At the opening meeting for the session of the School of Pharmacy Students' Association, the President, Professor Attfield, F.R.S., occupied the chair, and the introductory address was delivered by Mr. Francis Ransom, of Hitchin, member of the London Board of Examiners of the Pharmaceutical Society. The address, which we hope to reproduce later, abounded with useful suggestions to students, from whom it merits more than a passing notice.

The paper, entitled "Notes on the Chemical and Microscopical Examination of Urine and Sputum," read by Mr. E. J. Millard, at the meeting of the Chemists' Assistants' Association on Thursday week, dealt with matters of pressing importance to pharmacists, and by the assistance of Mr. Angus, Pathologist at the London Hospital, the author was enabled to emphasise his remarks by a practical demonstration of several of the processes described.

A botanical description of the new species of jaborandi, *Pilocarpus microphyllus*, Stapf, was read before the Liverpool Chemists' Association on Thursday week, by Mr. T. H. Wardleworth, who also stated that Mr. Conroy had determined the presence in the leaves of an alkaloid possessing all the chemical properties of pilocarpine.

The twenty-sixth annual dinner of the Nottingham and Notts Chemists' Association will take place at the Masonic Hall, Goldsmith Street, Nottingham, on Wednesday, December 6, at 8.30 p.m. Tickets may be obtained from the honorary secretary of the Association, Mr. William Gill, 207, Radford Road, Nottingham, or other members of the committee.

In connection with the opening of the new laboratories of the Institute of Chemistry, on December 8, the Secretary writes to inform us that the ceremony will take place in the presence of a number of representatives of learned societies and professional bodies, invited for the occasion by the President of the Institute, but that it will not be possible on that day to admit the Fellows generally or the public. The laboratories may be inspected, however, after the approaching examination is over, at times which will be announced later.

# Parliamentary and Law Proceedings.

## PROSECUTIONS UNDER THE PHARMACY ACTS AT GLASGOW.

On Thursday, November 23, in Glasgow Summary Court, Sheriff Birnie disposed of eight complaints against various parties in Glasgow and Govan at the instance of Richard Bremridge, 17, Bloomsbury Square, London, W.C., Registrar under the Pharmacy Acts, 1852 and 1868, with the concurrence of James Neil Hart, Procurator Fiscal of Lanarkshire.

Mr. Thomas Shaw, M.P., and Mr. T. B. Morison, advocates, instructed by Mr. P. Morison, S.S.C., Edinburgh, and Messrs. Martin and Barrie, writers, Glasgow, conducted the prosecution.

The first case called was that of Mrs. Agnes Walker, 10, Candleriggs, against whom there were two charges—(1) of having sold oxalic acid on June 15, 1893, and (2) of having sold oxalic acid on July 28, not being a duly registered pharmaceutical chemist or chemist or druggist within the meaning of the Pharmacy Acts.

Mr. John M'Tavish, writer, Glasgow, appeared for the respondent, who pleaded guilty.

Mr. M'Tavish said he was only instructed the previous night, and had an opportunity of seeing his client only that morning, and on his advice she had pleaded guilty, because it might turn out that the sales took place. Mrs. Walker was a widow, carrying on the business of her husband, who died four years ago, and between the date of the death of her husband and the present time she had had a qualified man in her employment on several occasions. It seemed that on the occasions libelled a sale might have taken place. She had a qualified man for eight months. It seemed that oxalic acid, which was the drug sold here, was a very common thing, and not one of the poisons that had to be entered in a book. Any person could go to a drysalter and order it wholesale. There was no doubt, he thought, that the offence was committed, but under the circumstances he thought that a nominal penalty might be made.

The Sheriff: Has she been carrying on the business of a chemist without any registered person at all? What do you say to that?

Mr. M'Tavish: No, my lord, she has had several registered persons.

The Sheriff: For the last eighteen months she has had none. Have you any answer to that?

Mr. M'Tavish: No, really I have no answer. It is a case of *ignorantia legis*. Whatever she did, she did in ignorance of the law.

The Sheriff: How can you possibly say so? She had a husband who knew well enough about these matters, but he unfortunately died, and she got registered men, and then she had some unregistered men for eighteen months. So far as one sees there is not very much to say for her. I should like to hear some of the other cases before giving judgment in this case.

The next case was against James Brown, 229, St. James's Road, Glasgow, who was charged with having sold oxalic acid on June 15, 1893, not being a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act.

Mr. John Locke Anderson, writer, Glasgow, appeared for the respondent, who pleaded guilty.

Mr. Anderson: The circumstances here are that the wife of the accused had a druggist's business for the last twenty years at this address. Lately the accused married her, and continued to carry on the business. Oxalic acid is the only poison they ever had or sold.

Mr. Shaw: Was oxalic acid the only poison you had in the chemist's shop?

Mr. Brown; No, it was not the only poison.

The Sheriff: There is a lady carrying on a chemist's business, and we do not know whether she is certified or not. Is she?

Mr. Anderson: No.

Mr. Shaw: And never has been.

The Sheriff: Then this man marries her, and he has been going on absolutely against the Act, and never asking whether there is an Act or not.

Mr. Anderson: They are in very poor circumstances.

The Sheriff: That is the most essential fact you have told me. You will allow this case to lie over till we hear some of the others.

The next case was against Robert White, 13, Morrison Street, Glasgow, who was charged with selling oxalic acid on July 28 and 29, 1893, and with selling prussic acid, opium, and chloroform on July 29, 1893, he not being a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act.

The accused pleaded not guilty, and was defended by Mr. William Borland, writer, Glasgow.

The first witness called was John Rutherford Hill, who deponed: I produce the Register of Pharmaceutical Chemists and Chemists and Druggists for the year 1893. The name of the accused does not appear on the Register. On Friday, July 28, 1893, I sent my assistant, Joseph Tait, into the respondent's shop at 13, Morrison Street, Glasgow. That shop is tenanted by Dr. James Walls White. The name above the door was J. & J. White, but I understand that Dr. White is the sole proprietor. I saw the accused, Robert White, supply oxalic acid to Joseph Tait, whom I had sent into the shop. Tait paid Robert White for the oxalic acid, and he brought the packet out to me as desired. I stood outside the door during the time the transaction took place. I had a quite distinct view of what was going on inside. There was an apprentice boy besides White in the shop.

Was there anyone in superintendence in the shop overlooking the transaction or correcting or superintending Robert White in any respect?—There was no person except these two in the shop. On receiving the packet from Joseph Tait, I put my initials on it at the time. I now produce the packet, having attached to it a label. I have noted the facts on the label. They were put on it at the time of the purchase. The hour at which I made the purchase was 6.10 p.m. I signed the label, and Joseph Tait also signed it. I am a skilled analyst, and I afterwards analysed the substance that was bought on that occasion. Analysis is a considerable part of my duties. I found the packet to contain oxalic acid, which is a poison scheduled under the statute of 1868. I attached a docquet to the packet and signed it. On July 29, 1893, I again sent Tait into the shop. There was a person present then of the name of Hugh Miller. He and Robert White were present, as well as the boy who had been there on the previous occasion. I understand that Hugh Miller is the manager of the shop. He is not a registered chemist. He is generally understood to be the manager. On the 29th Tait was served by the accused, Robert White. White sold Tait oxalic acid, as on the previous day. He handed the packet to Tait, and then I received it. It was similarly marked. I now produce the packet No. 2. I subjected it to an analysis, and found that it contained oxalic acid as before. That transaction was at 4.20 on the 29th. On the same day, about six o'clock, I returned to the shop, along with Joseph Tait. The same parties were present—Miller, White and the apprentice boy. I entered the shop on tha occasion, and I gave a prescription. I now produce the prescription. It is for bicarbonate of sodium 2 drachms, bismuth subnitrate 2 drachms, prussic acid half a drachm, tincture of opium 2 drachms, spirit of chloroform 2 drachms, water to six ounces—a tablespoonful every four hours. The prussic acid, opium, and chloroform are scheduled poisons under the statute. I tendered the prescription at first to the little boy, and he went and brought out Mr. Miller, who took the prescription from me and asked me to take a seat. At that point Robert White came forward and got the prescription and proceeded to dispense it, while Miller went to the desk and appeared to copy the prescription into the prescription book, and he also wrote the label. After dispensing the prescription Robert White attached the label to it and wrapped it up and gave it to me. I paid him 1s. 9d. for it. So far as the dispensing of the medicine and the wrapping up and labelling and delivering it were concerned, that was entirely done by the accused, Robert White. I went outside and found Tait there. He had come into the shop while I was there. I showed him the bottle, and he put his initials on it. I now produce the bottle. It was labelled at the time and signed by me and Tait. It was analysed and found to contain prussic acid, opium, and chloroform. While I was waiting for the medicine Tait entered and purchased a bottle of chlorodyne.

Will you tell me generally, did the business seem to you to be conducted in the way of selling medicines to any comer in the ordinary way, as if it were an ordinary druggist's shop?

Mr. Borland: I object to that question. We are not charged with keeping open shop.

The Sheriff: Is there another charge under the Act?

Mr. Borland: There is a competent charge.

The Sherriff: Is it of any use?

Mr. Shaw: No, I don't think so. I think the three transactions prove the practice.

Mr. Borland: Do you think three transactions in two days is good business?

Mr. Shaw: No, but I say that every transaction scrutinised on that day was an illegal transaction, and that is bad business.

Cross-examined by Mr. Borland: When I went into the front shop on the last occasion there was no one there except the boy. The other two were behind. There are evidently back rooms, but I cannot say whether there is one or more. I cannot tell whether they were both in the same room. I saw where they came from. They came from the back, but I cannot tell whether it was from the room. They came from the door, and I suppose the door led into a room. I did not see the door being opened. I cannot tell whether the boy went in without opening the door.

Joseph Tait, who was sworn and examined by Mr. Shaw, deponed: I know the shop at 13, Morrison Street, Glasgow. On Friday, July 28, Mr. Hill sent me into that shop for 2d. worth of oxalic acid. I asked for it and was served by the accused, Robert White. A boy was in the shop. White took a bottle from the shelf, weighed out the acid, wrapped it up, labelled it, and handed it to me. I paid him for it and took it out to Mr. Hill, who was standing outside the shop. What I purchased is contained in the packet now shown to me. I put my initials in pencil on the packet at the time, and I signed the docquet which Mr. Hill attached to it. I saw Mr. Hill analyse it. On the following day, Saturday, July 29, 1893, Mr. Hill sent me into the same shop for 2d. worth of oxalic acid. Hugh Miller was behind the counter, and a boy was also there. Robert White served me. I asked for oxalic acid from him and he put it up as formerly supplied, and I paid him. I took it out to Mr. Hill, and I now produce the packet. I initialled it at the time, and afterwards signed the label. I saw that analysed by Mr. Hill also. In both these cases the substance that was found was oxalic acid. On the same afternoon, about six o'clock, I accompanied Mr. Hill to the shop, and he produced a prescription. He had shown it to me before going in. Robert White dispensed the medicine and put it into a bottle, labelled it, and handed it to Mr. Hill. I was outside and Mr. Hill went in himself. Mr. Hill handed me the bottle when he came out, and showed it to me. I put my initials on the wrapper. (Shown bottle.) That is the medicine that was got.

I saw Mr. Hill analyse the contents and find opium, prussic acid, and chloroform.

Cross-examined by Mr. Borland: I am fifteen years of age past. I did nothing towards analysing the contents of that bottle. I just stood by while Mr. Hill did it. I was not able to check whether Mr. Hill was doing it rightly or not. I only know what he told me.

Mr. Shaw: I put in these productions, and that is my case.

For the defence the first witness called was Dr. James Walls White, who, being sworn and examined by Mr. Borland, deponed: I am a doctor of medicine of Glasgow University and a registered pharmaceutical chemist. I have a shop at 13, Morrison Street, in which drugs are sold. The accused, Robert White, was temporarily in my employment on July 28 and 29 last. He came to me as an obligation as relieving assistant. He was then acting as my servant or assistant in selling in that shop. The sales that he effected in that shop were sales on my account. He was not a regular assistant. My regular assistant, Mr. Hugh Miller, was away on his holidays, and I asked Robert White to come as a favour and let Miller away, knowing that White was well qualified. He is a medical student, and has passed all his examinations in pharmacy, botany, and materia medica. In my opinion he was quite competent to act as an assistant in the shop, or I would not have put him there. I have been in practice for over twenty years, and I have been in the drug trade for over thirty-five years. I was in the drug trade before the passing of the Act of 1868.

Both before 1868 and since has it been a common practice for medical practitioners in Scotland to keep drug shops?

Mr. Shaw: I object to that question.

The Sheriff: But you and I know it to be a fact, so that you do not need to care much.

By Mr. Borland: I understand that the answer is taken in the affirmative?—Yes.

What are apothecaries?—Apothecaries are members of the Apothecaries' Society of London, holding powers almost identical with surgeons in Scotland. They keep drug shops, and they also prescribe. As part of the medical curriculum it is necessary that students should have practice in dispensing. As part of the curriculum of pharmaceutical chemists it is necessary that students should have practice in dispensing, and expertness in dispensing is one of the things upon which they are examined. They cannot acquire expertness without practising. They are examined in practical dispensing. The terms of the examination are to weigh, measure, and compound medicines, write directions in concise language in a neat and distinct hand, and the time taken by the candidate in doing the work is noted. That is in order to test their expertness. That is in the printed particulars of the Pharmaceutical Society.

Cross-examined by Mr. Shaw: The shop at 13, Morrison Street, is the only shop I have. I have had it for thirty-five years; at least it is the same business. Robert White is my nephew. He was only temporarily helping me in lieu of another assistant, Hugh Miller. It is quite possible that Miller was present when Robert White was there on Saturday, July 29. Robert White was there simply for one week, while Miller was away on his holidays, but as far as I can understand Mr. Miller came back on the Saturday afternoon and wanted to get an extra Saturday, and he was in the place for a few hours. That is the only explanation. I am not astonished to find that Miller was there. I knew that he had been up. Miller is not a registered chemist.

Was it a case of one unregistered man taking the place of another unregistered man?—But I was there. I have a very limited visiting practice in Glasgow. I reside in Uddingston, and I am there till eleven in the forenoon, and then I am in town, and I go back to Uddingston at 2 or 3 o'clock in the afternoon. I carry on a doctor's business in Uddingston in a small way, but my principal place of business is in Glasgow. My shop ought to open at 9 o'clock or 8.30, and it closes in the evening at 9 o'clock. It is open for about twelve hours a day. I am there for about five hours a day, because I go back in the evening and spend an hour there.

For seven hours, during which this business is conducted, is it conducted in your absence by an unqualified assistant?—He is not unqualified. He may be unregistered. He is thoroughly qualified, and has had a very long experience—for about thirty years.

But so far as the law of the land goes the qualification which the Statute prescribes is not your assistant's qualification, is it?—He is not registered.

Were you aware that the Pharmacy Act required people who dispensed medicines to be registered?

Mr. Borland: I object. That is a question that the court is to determine. That is the point at issue between us.

The Sheriff: I do not think it is of any importance. The doctor knows about the Act.

Dr. White: Yes, I know it thoroughly. I have passed its examination.

By Mr. Shaw: You know the Pharmacy Act thoroughly?—Yes. I am responsible for the man in my shop, and I have been so all along.

Is it your view that you can put anyone there you like if in your opinion he is qualified?—I am the judge of whether he is qualified or not.

Is that your view?—Yes, and it has been all along.

If you thought any servant of yours, man or woman, was qualified, would you put him or her in in defiance of any Act?—No. I am not going against any Act. I am following your Act.

What steps did you take to comply with the statute?—In the case of my assistant he has been with me for twenty-eight years, and he knows the whole thing.

Have you tried to supply some equivalent of your own?—No.

Since you are referring to your own views, might I ask you why you referred to the apothecaries?—I answered what I was asked. I did not refer to them.

Had you no idea what the meaning was?—I have nothing to do with the question.

Is it part of your evidence that the object of this accused being there was, as it was put, to acquire expertness is dispensing?—I explained to you before that he was put there simply as a convenience.

But a good deal more was put to you, and you were ready to assent when it was from the other side of the bar. May I ask if you put Robert White there to acquire that expertness?—He could not acquire expertness in a week.

Then that had nothing to do with your putting him there?—No, not on that occasion.

Can you tell me of any registered assistant you ever had?—I have had no other assistant but this man for twenty-eight years.

By Mr. Borland: Hugh Miller has been with me for over twenty-eight years, boy and man. I never had any occasion to employ both Hugh Miller and Robert White at the same time. If one was there the other did not require to be there. I have a consulting room in that shop, and another back room besides.

Robert Brodie, being sworn and examined by Mr. Borland, deponed: I am a chemist and druggist at 253, Crown Street, and I have carried on the business there for about seventeen years on my own account. I have been connected with the business for fully forty years, and I have been registered for twenty years, I think. I am familiar with the business.

Is it a common practice for medical practitioners to have drug shops in Scotland?—I can speak for Glasgow, and that has always been a common practice in Glasgow. In fact, from my own recollection, I can say that at one time there were not more than three chemists on the south side of the river. They were all medical practitioners who had shops at that time. That practice was both before the passing of the Act and since.

Has it been the practice of the Faculty of Physicians and Surgeons in Glasgow to appoint annually an inspector of drugs?

Mr. Shaw: I object to this. I think that is quite irregular and incompetent.

The Sheriff: I do not know what it is for. I think you had better allow it to go on.

By Mr. Borland: Is it the practice of the Faculty of Physicians and Surgeons in Glasgow to annually appoint an inspector of drugs?—They had that power at one time, but they allowed it to lapse. They had the power in their Charter. It never was in force in my time, although I knew they possessed the power. There are no apothecaries in Scotland, but there are in England and Ireland. They are equivalent to our surgeons. They possess medical qualifications, and in England they are entitled to dispense their own medicines. They do not necessarily keep drug shops, but they are entitled to prescribe and dispense medicine. I can scarcely say whether they keep drug shops in England from my own experience. It is necessary, both for medical students and students in pharmacy, to have experience of dispensing drugs and selling drugs. Pharmacy students are examined as to their expertness in making up prescriptions. That is the case when they go up for their examination. They must pass an examination before they can be registered. I should think they could not acquire expertness without practice.

Cross-examined by Mr. Shaw: When they practice, do they practice under supervision?—It cannot always be done.

Do they practice at the risk of the public? They are usually considered to be intelligent individuals.

But will they not only acquire their intelligence by practice?—Their experience comes gradually. They are not allowed to dispense prescriptions. It is better to have the practice under a skilled eye.

Would there not otherwise be a danger to the unfortunate public?—According to the intelligence of the dispenser.

The safety of the public would be more or less in danger?—Yes.

Mr. Borland: That is my case.

Mr. Shaw: I am very glad, my lord, that the defence in this case has been entrusted to Mr. Borland, because I may say that I consider this the leading case, and one of very considerable interest to the city of Glasgow, and I must press your lordship here not only for a conviction, but for the full penalty.

The case is brought, as your lordship knows, under the Pharmacy Act of 1868, and as it is quite clear that this case will have very considerable effect on the practice of dispensing of medicines in Glasgow, I may be permitted, even at the risk of repeating what, I am afraid, is only too familiar to your lordship, to give a synopsis of our view of the statute. In the first place, I call your lordship's attention to what is the object of the Statute, as set forth in the preamble. There is no getting over the fact that the object of this Statute was the safety of the public. That is set forth in the preamble, and in sections 1 and 15 we have that object protected, as far as Statute can, by setting forth what are to be the qualifications of those who either assume the title of chemist and druggist or assume the function of dispensing poisons. May I say, my lord, with regard to the present case, that the facts are singularly simple. I don't think, indeed, there is any dispute as to the facts here. The facts are these, that we have three instances of a sale, unquestionably a sale, by the accused. Secondly, these three instances embrace what are poisons under the schedule of the Pharmacy Act. There are four poisons dispensed on these three occasions—oxalic acid, prussic acid, opium, and chloroform. Now, it is not necessary to lead any evidence as to the danger of such a method of doing business. If the safety of the public is to be reached at all, it is by preventing the sale of scheduled poisons being conducted by unregistered persons. Now, there is no doubt that the accused did dispense these. Secondly, there is no doubt that these poisons are poisons under the Act. As far as I have been able to gather, Mr. Borland's case is this, that there is a defence to the effect, "Oh, but it is a doctor's shop, and it does not matter." It is suggested to the court that if the lad who dispensed it had some skill, it does not matter, so far as the Statute is concerned, and that the doctor, and not the legislature, is entitled to be the judge of the qualifications of the seller of poisons. Now, upon that matter, may I say that the law seems to me to be absolutely well settled to this effect, that the qualification of being a registered chemist must attach to the person who performs the act of dispensing or selling. Nothing can get over that under the Act of Parliament, and under the cases that I am going to cite. The Act, in section 1, as your lordship knows, deals with several cases. It deals with the case of a person selling and a person keeping open shop for selling, dispensing, or compounding poisons, and a person assuming or using the title of chemist and druggist. I am under the first of these three branches, and I say that in the meaning of the Statute the person selling is the person who actually puts his hand to the transaction, and performs the act of making up the medicine and handing it over in sale. There is no doubt whatever that there has been a variety of attempts to get over that, and to say that in an imputed sale the person selling is the person for whose interest the sale has taken place. These attempts have, each and all of them, absolutely failed. There was a recent case in the town of Hamilton, presided over by your lordship, and I think it right that your lordship should have a note of it. It is fully reported in the *Pharmaceutical Journal* of July 14, 1888. Your lordship may remember there that the defence set up was the same that Mr. Borland puts up here—that the doctor was the real owner and occupant, and that he had an unqualified man, whom he referred to as a first-rate fellow, who could do his work thoroughly well; but your lordship held that a conviction must unquestionably follow. The other case was in England, by the Pharmaceutical Society against Wheeldon. That was decided by Baron Pollock and Justice Hawkins—By section 15 it is provided—as I have already held—that an unregistered chemist's assistant, who, in the absence of his master, sells any poison or preparation containing poison, as in that Act defined, is liable to a penalty under the above section, though he effects such a sale on behalf of his master, and though his master is duly certified. Now, I think that is particularly strong. "It was contended by Mr. Finlay," says Mr. Justice Hawkins, "on behalf of the appellant, that it was not unlawful under section 15 for an unqualified assistant of a duly qualified chemist to sell poisons in his master's shop in the ordinary course of his master's business, and that in the sale by the appellant as a servant in the discharge of his duty the master was in law and in fact the seller." I ask, in your lordship's judgment, whether that is not exactly the case which is put forward here? As the master was qualified, it was contended that the sale was lawful. It was further suggested that he could not afford to employ a qualified assistant. I think that that argument could hardly be used here, because it would certainly be no hardship of any substantial kind to say that if doctors, who well know the Pharmacy Act, insist on keeping shops, they must have a qualified person. I do not elaborate that point, because it appears to me, and I am humbly in your lordship's judgment, that that is the identical case that your lordship is dealing with. Now, Wheeldon's case was not a case in the dark. It is perfectly out of the question to suggest that there was any ignorance on the part of the medical profession or on the part of those who follow the honourable business of chemist and druggist. I may say to your lordship that it is within your judicial knowledge that these cases are fully reported in all the trade journals, and especially in the city of Glasgow, and this thing is to be once and for all put an end to. Only this last year your lordship had well nigh a dozen of these cases in which the provisions of the Act were fully brought before the public. These cases are notorious, and for a man in Uddingston with a medical practice to put forward as a defence that he has a man whom he thinks to be qualified, but whom the Statute does not recognise, conducting his shop for seven hours out of the twelve in a densely populated district of Glasgow is an inexcusable thing, and I submit that your lordship ought in this case to make no distinction at all in the way of leniency, because it comes to this, that unless your lordship is to pronounce such a judgment as will come home to the public mind, it is impossible to secure that this Statute shall be complied with. Behind us there is the insistance of the Treasury that these cases must be brought before the public mind, and there are unfortunately cases of poisoning occurring from the supply of medicines in such circumstances. These cases are very fully before the public mind in coroners' inquests south of the Tweed, and the Treasury insists that we must defend registered practitioners by insisting that the provisions of the Statute shall be complied with.

Mr. Borland: I don't think we have much to do with the Treasury. All that your lordship is to judge of is whether the prosecutor's interpretation of this Statute is correct. I don't know that we have much to do with English decisions. These decisions are not authoritative, and while they may be of use as furnishing either side of the bar with arguments as to the true interpretation of the Statute, these decisions are not binding upon any court in Scotland. Still less are these binding upon practitioners in Glasgow. It is quite enough that the presumption of law should stand that all traders are bound to know the law of Scotland without also requiring that traders in Scotland should know the law of England. We are not pleading this case before your lordship on the ground that the accused was ignorant of the law. The case is pleaded before your lordship on the ground that we were complying with the law, and the case I submit to your lordship, is that the law was complied with in the circumstances. The person who actually sold in this case, through whose hands the sale was effected, was a person who, as far as examination was concerned, was entitled to sell. That is to say, he was a medical student who had passed all that portion of his examination which qualified him, as far as a chemist and druggist was concerned, for carrying on the business of a chemist and druggist, but he had not passed all his other examinations to qualify him as a doctor of medicine. I only refer to that as showing that Dr. White took care regarding the person who was representing him in this shop. I do not plead that as a ground of *absolvitor* in this case. My plea is that the qualification of the doctor protected and covered the business, and, to put the plea technically with reference to this complaint, my plea is that the accused, Robert White, did not sell, could not sell, that the commodities that were sold on the occasions libelled were not his to sell, and that if he sold them he would have been guilty of theft. The commodities, stock, and drugs were the property of Dr. White, and the sale effected through the accused was a sale by Dr. White of Dr. White's goods in exchange for money which, upon the sale being completed, was Dr. White's money. I say that the accused did not sell. There may be other clauses in the Act under which this prosecution might have taken place, but I am not concerned with these. Before passing to these, I ask your lordship's attention to the Act, before mentioning the English decisions, because your lordship has to construe the Act of Parliament. Reference has been made to the preamble. Instead of being against my contention, I submit that it strongly corroborates the view which I submit to your lordship. This is a statement of the circumstances which the Act is intended to remedy. The words are, "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing and dispensing or compounding of poisons, and persons known as chemists and druggists, should possess a practical and a competent knowledge of their business," etc. That is the only thing that is said to be desirable. Then there comes the means by which that is attained. "That from and after the day named all persons not engaged in such business are, before commencing such business, to be duly examined as to their practical knowledge, and that the register should be kept as herein provided." Now, I submit to your lordship that that preamble deals with the principal and with no one else. The persons who are to be dealt with are persons keeping open shop and persons known as chemists and druggists. These are certainly principals, and not assistants or apprentices. Then it is said that the means by which that is brought out is that they are not to commence business, showing that we are dealing with principals solely. The person who is to commence business is the person pointed at by that Act. I cannot conceive any argument to the effect that this preamble contemplates an assistant in a shop. Then we come to section 1, "From and after December 31, 1868, it shall be unlawful for any person to keep open shop for the purpose of retailing or dispensing or compounding poisons," &c. The words are "To sell or keep open shop." I submit that unless there were clear words the context is to be interpreted by the preamble, and that we are not to assume that the first section goes beyond the preamble, which only contemplates the person who carries on the business. One can conceive of a hundred reasons why the expression should be put in this contemplative form, "sell or keep open shop." One of them is that the use of the name chemist and druggist is simply the use of an open shop without the necessity for any sales. If a man opens a drug shop and keeps it open he is guilty of an offence under the Act, even although the prosecution should not be able to prove a single sale. If he keeps open a grocer's shop or any other kind of shop, or if he sells drugs without keeping open a druggist's shop, then he is liable, or if he chose to hawk them about he is liable; but the words are put in alternatively, where this is an isolated instance, such as a grocer's or an ordinary chemist's, or any other trade where these things might be sold. Then it is intended to cover the case of carrying on openly the business of a chemist and druggist or to prevent the business of hawking. The intention of putting in the word "sell," as far as one can gather by the section, is to make it clear that the person is not to carry on a business, either openly or incidentally, that he is not to get off on the ground, "I am not carrying on the business of a chemist and druggist, but the business of a grocer or drysalter, or the business of an analytical chemist, and the selling of these poisons is only an incident of my business, and I am not struck at by the preamble." The answer is "You must not sell." Then, on the other hand, the carrying on of the business is quite clear. So much for the meaning of the words "sell and keep open shop." The rest of the Act of Parliament also corroborates that. Then there is section 16, to which I may refer as to the scope of the Act, "Nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary or of any member of the Royal College of Veterinary Surgeons, nor with the making or dealing in patent medicines, nor with the business of wholesale dealing in supplying poisons in the regular course of wholesale dealing." That shows, in the first place, that this Act does not cover the whole ground, that you are not to read the preamble and section 1 as dealing with every sale of poison by anybody anywhere. It is only when we come to section 16 that we come to deal with it, that we are dealing with a limited class of persons, namely, persons who did carry on the business of chemists and druggists before the passing of the Act, or who are registered under it after the Act. The persons who are excepted are apothecaries. What kind of business do they carry on? They have a drug shop and they do not require qualified assistants. They carry on the business of a drug shop and they may have as many assistants as they like. A member of the Veterinary College may sell poisons. Poisons are constantly sold by them, and yet they require no qualification under this Act. Of course wholesale dealers may carry on business, but what is a wholesale transaction no one knows. There is no definition in the Statute that makes the poison wholesale. I merely refer to this as showing that the statute does not cover the entire ground, which is the assumption of this prosecution, and that the protection of the public does not require that your lordship should consider the preamble and section 1 as if it covered everyone who handled poisons. An argument is used by Mr. Justice Hawkins in that case of Wheeldon, which I suspect has been used in his haste. He says that there is a proviso at the end of section 17 which confirms the view of the prosecution. It is not a proviso at the end, but in the middle, and it is as follows:—"For the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller." My contention is that that corroborates my view. How can an apprentice or servant sell if section 1 prohibits his selling? That section contemplates that the sale may be effected through the instrumentality of an apprentice or servant. No doubt the sentence is introduced by the words, "For the purposes of this section," and therefore I cannot treat that section as an interpretation of either section 1 or section 15, but I do found upon that section as showing that the Statute contemplates sales by unqualified persons, because it is quite clear that an apprentice cannot be a qualified person, although a servant might be. The reason, I submit, for putting in the words, "For the purposes of this section," is that that section deals with a great many things. It deals with putting the name on, for instance. In interpreting that section it was held in one case, the reference to which I have not got, but I refer to it for the sake of illustration, that where a man sold as agent for another, and put the name of his principal upon the package because the premises were the seller's premises and not the principal's, he had not complied with the Statute, that where it is an agent who has premises of his own and there sells goods on behalf of an absent principal, he must put his own name as seller, and that the meaning of that proviso is not that the person who happens to be his principal is the seller, but it was to deal with cases of that kind that that proviso was put in. I am not concerned with the interpretation so far as it affects section 17, but it contemplates that a man may sell by means of an apprentice or a servant. I now state to your lordship the object with which I led the evidence about apprentices and servants requiring certain experience and requiring to have a certain expertness. The person contemplated in this Act, as decided in the House of Lords, is a person who may be examined, and as a corporation cannot pass an examination under the Pharmaceutical Society, a corporation is not struck at by the Act. I take that interpretation of the word "person," and I say that a "person" is one who may acquire a qualification, and provision is made in the Act for the persons contemplated by that Act acquiring the qualification therein mentioned, and power is given to this Society to have an examination. One of the subjects for examination is the technical expertness of the applicant in doing the mechanical part of his work, namely, making up prescriptions. How can anyone acquire that expertness unless he is allowed to practice? An attempt is made to get over that difficulty by saying that upon this occasion the accused was not acquiring expertness. That may or may not be. We are not just now dealing with the question whether this was an apprentice or not. We are dealing with the reasonable interpretation of the word "sell," and I submit that the word "sell" cannot be construed as covering the case of an apprentice or assistant selling, except on the footing of its prohibiting the sales by learners. If it does not prohibit learners, it should not prohibit the person who is going through his experience in that manner. There is another point in the same connection. I have called your lordship's attention to the fact that there is taken out of the scope of the Statute the business of an apothecary, a member of the College of Veterinary Surgeons and wholesale dealers. This Act, like a great many other Acts, was framed in England, and the framers of this Act, as in a great many other things, were utterly ignorant of Scotland and Scotch business, and the result was that it was immediately discovered on the passing of this Act that if it was to be interpreted according to these words it would interfere with the business of Scotch doctors. But there was no reason why Scotch doctors should have their business interfered with if English apothecaries and veterinary surgeons were exempted from the Statute, and accordingly we have the amended Statute of next year passed with special reference to Scotch doctors. That is the Pharmacy Act of 1869. I submit that the first part of section 15 puts doctors who have drug shops in Scotland into the same position as apothecaries, and who carry on business in virtue of their diploma. In this case the accused was the servant of a person who had both qualifications, and for the purpose of his qualification I plead his qualification as a physician, and I submit that the amending Statute protects the business of a physician. I have no concern with the question whether under that interpretation the Statute is satisfactory or not. We are not dealing with that. We have the protection of the qualification of a doctor, which is a higher qualification than the qualification of a chemist and druggist, and includes it. He is entitled both to dispense and to prescribe, which a chemist and druggist is not. I put this case to your lordship, could a doctor not give a prescription to a patient in the course of his rounds, and that prescription be taken to the doctor's own shop and be dispensed without being liable to an offence under the Act? If this interpretation be correct, he could not, when visiting me, give me a prescription and say, "Take that and get it, and use it in the way ordered." I do not need to go to this doctor's own drug shop. I can go anywhere. But if I chose to go to the doctor's shop this Statute would prohibit that sale. Now, I submit that that was never the intention. So much for my reading of the Act. I ask you to consider the meaning of the word "sell," and I refer your lordship to an analogous Statute. The Statute I refer to is the Salmon Fisheries, under which it was held that liability attached only to the master and not his servant. I take one further argument. If that were the interpretation to be put on the Pharmacy Act, then two prosecutions might take place for the one offence. A servant might be apprehended, and so might the master, for a particular sale of oxalic acid. I now come to what is said in the decisions quoted by Mr. Shaw. The first case, I submit, has got nothing to do with the present question. It determined one point only, namely, whether a corporation was a person in the sense of that Act. I submit that no observations made in the course of the case have any bearing on the present question, but that the scope of that case supports the view for the accused here. The scope of that case is that the Statute contemplated an examinable person, and that the word "person" is to be construed in that sense, and I submit that here is exactly the argument that I have submitted to your lordship. It also contemplates that these persons should go through whatever the legal forms are, and one of these is that they must learn the business. The same observations are made by Lord Selborne, and certainly his opinion is entitled to the greatest weight, but the case he was construing was that an actual sale was made by a qualified person, and he was applying his mind to this question. That being the state of the facts, was the Statute complied with? He says undoubtedly the Statute was complied with by the sale having been effected by a qualified person. Now, I submit that, applying that to this case, and supposing that the accused had been a qualified person, and Dr. White was not, then I submit that they could not have prosecuted under this clause of the Act. They might have prosecuted Dr. White for keeping open shop, but not for selling, because he had employed a qualified person to represent him. The interpretation of the Statute would be either that the shopkeeper has the qualification or the person who actually sells has the qualification. That is sufficient, and that interpretation has received effect in Edinburgh, where this same society which professes to be prosecuting here solely in the interests of the public, notwithstanding that case in the House of Lords, actually prosecuted seven shareholders in a limited company carrying on the business on the theory that these seven shareholders were keeping open shop, and that as these seven shareholders had no qualifications, although the certificated manager had a qualification, they violated the Act. So much for that case. The only remaining case is Wheeldon's case. There are various things in this case that are incapable of being received here. Justice Hawkins says that a sale by an assistant who is not a qualified person cannot be supported, unless he acts under the personal superintendence of a qualified employer or another qualified assistant. I should like to know where he gets that in the Statute. The prosecutors cannot take refuge in that observation. If their case is good at all they must plead it as high as this: If the compounding and selling over the counter is done by an unqualified person it is the person by whom it has been handed over the counter who is the seller under the Act. If I had brought forward here evidence of a qualified person, I would have been met by this, that these statements of Justice Hawkins' are *obiter dicta*. I submit that there is no halting point between the actual compounding and the handing over of the assistant by his own hands and authorising a person to carry on a business on his responsibility if his assistants are sufficiently qualified. Now, I have dealt already with the only two arguments that are contained in the case of Wheeldon. The first is the argument from the preamble and then the argument from section 17, and I submit that both are in my favour. I have only one general observation to make. It is said that the public are not sufficiently protected by the responsibilities of an unqualified person. I don't think your lordship has anything to do with that consideration, but even although it was right, I submit that the public are sufficiently protected by that. He meant that it was not to be carried on by a person not acquainted with the risks of the business, but to say that a medical practitioner is not qualified is going in the teeth of the Statute, and that is a case of protection in dealing with these matters. As regards the amount of the penalty, I am not concerned to argue the matter very clearly before your lordship. We are treating this case as a test. Dr. White has carried on this business for years and years. His regular assistant is a man who has been with him for twenty-eight years, and, although he has not a qualification under the Statute, it is obvious that his experience is a far greater qualification than the mere passing of an examination under an Act of Parliament. We desire a judgment which will settle the question whether doctors are entitled to carry on this business or not, and if there is a conviction there should be only a nominal penalty.

The Sheriff: I had some years ago to consider this precise point, and I then gave what seemed to me the result of the decisions previously arrived at upon it, and instead of repeating that or meeting the argument of Mr. Borland, I think that my duty is simply to rest upon the two previous decisions which are against it. The first of these decisions is the Pharmaceutical Society against the London and Provincial Supply Association, Limited, and though it is perfectly true that that was a case raising the question as to whether the Association was a person under the Acts, yet it is the observations of Lord Selborne which are important. He says: "With regard to the mischief which beyond all controversy the Act was intended to correct, it leads me to this conclusion—namely, that he who sells, whether he be master or servant, whether he be a principal or a person whom he gets to sell, is struck at by the fifteenth section, because otherwise a very wide door would be open to the evils which the Act is intended to correct. If it were otherwise, nothing more would be necessary, according to the appellant's own argument, than that the business should belong to a person who does not himself carry it on, but who is qualified under the Act of Parliament, and he might be at liberty to employ in the management of this business persons not qualified by whom the actual sales would be made, and then the public would be exposed to all the dangers which the Act was passed to prevent." That case was in 1880, and it went to the House of Lords. Then we come to the Pharmaceutical Society against Wheeldon in 1890, where the rubric brings out the precise facts. "Held that an unregistered chemist's assistant who in the absence of his master sells any poison or preparation containing poison, as in that Act defined, is liable to a penalty under the above Act, notwithstanding that he effects such sales on behalf of his master." It does not seem to me that any Scotch inferior judge can be asked to go beyond those decisions of the Supreme Courts. I wish, however, to say this with regard to Mr. Borland's last argument that the very hand must be qualified, that I by no means connect myself with that. If there is a qualified person about the sale, I have no fear that any prosecution will be made. That is the only remark I would make.

Mr. Shaw: I ask for expenses.

Mr. Morison: Two guineas was the sum on the last occasion.

The Sheriff: With regard to the penalty, it is scarcely fair to call this a test case, because the case has been before the public for the last five years, and doctors must understand that their assistants must be qualified.

Mr. Borland: But it is a test case. In this case I may have to ask your lordship for a case to the High Court.

The Sheriff: It is not a test case in this sense, that this gentleman did not know that he was running against both English and Scotch decisions, and I think the penalty should be one guinea for each offence, with two guineas of expenses.

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Mrs. Agnes Walker was then called upon, when Mr. M'Tavish again appeared for her.

Mr. M'Tavish: As I stated to your lordship before, anything that Mrs. Walker did was done in ignorance of the Statute.

The Sheriff: In the last cases, where it was a woman not very well off, the penalty was £2 with two guineas of expenses. This woman must pay one guinea for each offence, three guineas, and two guineas of expenses.

James Brown was then called upon, when Mr. John Locke Anderson appeared for him.

The Sheriff: You have told me nothing yet in favour of the man in respect that he is not in very good circumstances. This is a man who knew perfectly well about it, because he has been brought up in the trade, and he carries on his business without caring anything about the Act. This is a case of a man who has not the slightest excuse, as in the doctor's case, where there was a legal argument, and he must pay a penalty of £5 with two guineas of expenses.

The Sheriff: I suppose, Mr. Borland, you ask a case in the last instance, that of White.

Mr. Borland: I am going to take a case, but I do not promise to take the last case. I was intending to take Tomlinson's case, because I think it raises the question in the form in which I should like it raised. I do not intend to take a case in this instance.

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The next case was that against Hugh Miller, 13, Morrison Street, Glasgow, who was charged with selling morphine and chloroform as ingredients in a bottle of Dr. J. Collis Browne's chlorodyne on July 29, 1893, he not being a duly registered pharmaceutial chemist or a chemist and druggist within the meaning of the Pharmacy Act.

On the accused pleading not guilty Mr. Borland appeared in his defence.

John Rutherford Hill, who being sworn and examined by Mr. Shaw, deponed: I produce the Register for 1893, and the name of Mr. Hugh Miller is not in it. On Saturday, July 29, 1893, I saw Joseph Tait enter the shop of Dr. White and purchase a bottle of chlorodyne from Mr. Miller. I afterwards analysed the contents of the bottle, and it contained morphine and chloroform, both of which are scheduled poisons. I produce the bottle, which has been in my possession ever since.

Cross-examined by Mr. Borland: The bottle was sealed up when I got it, and it had a Government stamp on it, just like the one shown to me. I have no doubt that it would be made up by Davenport, the manufacturer, and it was sold as bought.

By Mr. Shaw: It is not a patent medicine?—There is no patent for it, and never has been.

By Mr. Borland: A patent medicine is a medicine for which Letters Patent are granted. Letters Patent are granted for medicines. There is one very well-known one—Kay's essence of linseed. As I understand it, the ordinary interpretation of patent medicine is medicine for which Letters Patent have been granted.

Is it not a medicine for which government duty is paid?—No.

Is the ordinary acceptation of patent medicine a medicine which is treated as secret?—No, these are nostrums, and they are specially referred to in the Medicine Stamp Act as distinct from patent medicine.

By the Court: The ingredients of chlorodyne are morphine, chloroform, oil of peppermint, treacle, and some pungent ingredient, the exact nature of which I did not determine. There are about two grains of morphine to the ounce. I cannot tell the quantity of chloroform, but there was a considerable quantity. These are both poisons. Half a grain of morphine would be fatal to a child. Half a grain would be a dangerous dose to an adult in some cases. Chloroform is not such a dangerous substance as morphia by any means.

Would the amount of chloroform in that bottle kill a person if taken internally?—I could not quite say that it would. There is a considerable quantity of it present, but it may be taken internally in comparatively large doses.

Joseph Tait, who being sworn and examined by Mr. Morison, deponed: On Saturday, July 28, I went with Mr. Hill to Dr. White's shop at 13, Morrison Street, Glasgow. I got a bottle of Collis Browne's chlorodyne from Hugh Miller, and I paid him for it. I saw Mr. Hill analyse it, and signed the docket which is attached to the label. (Shown the bottle of chlorodyne produced.) That is the bottle.

For the defender, the first witness called was Dr. John Walls White, who being sworn and examined by Mr. Borland, deponed: The accused is my assistant. The business is carried on by me. Among other things I sell chlorodyne.

What do you understand by the expression "patent medicines?"—Medicines that carry with them a stamp as required by the Patent Office. No stamp is required except for patent medicines. (Shown licence, now produced.) That is the form of the licence. There are one or two makers of chlorodyne that make chlorodyne with the stamp on, and Collis Browne is one of these. We buy it with the Government stamp on it, and sell it without breaking the stamp. We are not at liberty to break the stamp.

Is the expression "patent medicine" recognised by medical authorities as covering all medicines requiring a Government stamp, and for the selling of which a Government licence is required?

Mr. Shaw: I object to the question as irrelevant.

The Sheriff: I could not decide the case without that.

Mr. Shaw: It is not only irrelevant, but it is a proposal that this gentleman should construe Acts of Parliament. In section 16 of the Act of 1868, the words "patent medicine" are used, and it is proposed to ask this gentleman what is the meaning of these words as he accepts them.

The Sheriff: Is there any definition of the words in the Act?

Mr. Shaw: No, but there are medicines for which a patent is granted. It has never been so treated, and I will give you an English authority that they have construed the Statutes bearing upon this.

The Sheriff: Do I understand that the difference between you and Mr. Borland is that Mr. Borland says wherever there is a stamp I am free, and you say no?

Mr. Shaw: That is what the court has decided.

Mr. Borland: In text books there are lists of patent medicines under that head, and I mean to refer your lordship to Cooley's 'Cyclopædia,' in which patent medicines have their Latin synonym, *medicamenta arcana*.

The Sheriff: I repel the objection in the meantime.

Mr. Shaw: My objection is to the line of evidence.

By Mr. Borland (to witness): What is your answer.—Yes.

Have you been in the habit of treating medicines bearing the Government stamp as patent medicines? Yes.

Is it the rule of the medical profession that none of their remedies are secret?—Yes.

Is it also a rule that none of the remedies are retained for their own exclusive use—that they do not make a secret of any remedies that they use?—Yes.

Have not the members of the profession been dealt with by medical societies for making and selling secret medicines?—Yes. It is contrary to the etiquette of the profession to do so.

Cross-examined by Mr. Shaw: I have said that it was contrary to the etiquette of the medical profession to make up secret medicines.

Is it contrary to etiquette to make up chlorodyne?—There are several preparations made under the name of chlorodyne, but we do not call it Collis Browne's chlorodyne.

But you make up chlorodyne?—Yes.

And it is just as convenient for you to sell a made-up bottle instead of making it up for yourself?—In selling you have to sell what is asked. If chlorodyne is asked for it is a convenience to have it made up.

Is it not a matter of convenience to sell it in the made-up fashion instead of making it up for yourself?—There may be a difference. Every maker can make his own.

But some people who can make it up would prefer to hand it over, having got it from another maker?—Yes.

And so far as Hugh Miller is concerned, if he liked he could have made it up?—No.

Did you ever prohibit him making it up?—No; but he could not make up and sell a bottle of Collis Browne's chlorodyne.

You are very shrewd, but it won't do with me—I refer to chlorodyne, and not to Collis Browne's chlorodyne. Did you ever forbid Hugh Miller from making up chlorodyne?—No; I never forbade him.

Do I understand you to say that all stamped medicines are patented?—Yes; we look upon them as patent medicines.

Are they?—I cannot tell; we look upon them as patent medicines.

You do not know whether the stamped medicines are patented?—That is my evidence.

But you can tell us that there are some medicines which are patented?—Patented in respect that they are stamped, but beyond that I do not know.

But you know that there are some medicines patented by Letters Patent?—I have never come in contact with them.

There is Kay's essence of linseed; do you know that that is patented?—No, I do not.

What you look upon is something with a stamp?—Yes.

And you do not know in fact whether chlorodyne is a patent or not?—No.

All that you know is that it has got a stamped wrapper?—Yes.

The Sheriff: I must have some more information as to the difference between patent medicine and stamped medicine, or how many patent medicines there are. I do not care where the information comes from.

Mr. Borland: I was going to ask whether, under the name of chlorodyne, there is a medicine called chlorodyne mentioned in the British Pharmacopeia.

Dr. White: No, not by that name.

Mr. Shaw: But the poisons under it are mentioned there.

Dr. White: Poison is contained in every combination.

Mr. Borland: Is there anything to prevent you writing a prescription containing the ingredients of chlorodyne if you saw fit?

Dr. White: No.

Mr. Borland: But do you ever allow anybody to sell as Collis Browne's chlorodyne anything else but the patent medicine that goes by that name?

Dr. White: No.

Robert Brodie, who being sworn and examined by Mr. Borland, deponed: The expression "patent medicine" has always been understood to be those medicines that were stamped by government stamps according to the value of the medicine.

Is it so treated in text books, such as Cooley's 'Cyclopædia' and others, under the head "patent medicine"?—I cannot say that with regard to Cooley.

But is it so treated in text books?—There is very little said about patent medicines in text books. It is not consistent with the etiquette of the medical profession to make their medicines secret.

Don't they deal with any members of the profession who invent and sell secret medicines?—That is one of the objections. If a medical man was bringing out a secret medicine, the faculty who licensed him would deal with him. It is contrary to medical etiquette for members of the medical profession to bring out secret medicines.

Do you know any medicines for which Letters Patent have been taken out?—Powell in advertising his balsam says that his formula was obtained in 1824, but his formula is now altered, and it is not patented.

Do you know any medicines for which Letters Patent were granted?—I am afraid that they would have lapsed long ago. I think there is one, Atkinson's infant preservative.

Cross-examined by Mr. Shaw: I know Kay's essence of linseed, but it is not patented by Letters Patent.

Are you aware that the fact is that they have Letters Patent issued for it and sell it under patent from Her Majesty?—They stamp it, of course. There is a government stamp on the bottles.

Would you mind bringing us up a bottle of Kay's essence, and we will see that you are fully paid for it?—Yes.

Are there any medicines in your judgment for which there is an existing patent?—I do not know of any.

And you do not know whether there are not any?—No.

Mr. Borland: That is my case.

Mr. Shaw: I must refer your lordship to one fact and one decision. The one fact is that it surely is a very peculiar patent medicine for which there is no patent, and, secondly, in fact it is a peculiar patent medicine if anybody can make it up and dispense it, because if it was a patent medicine they could not do that, except in violation of the Letters Patent. A patent medicine which anybody can dispense is a contradiction in terms, and a patent medicine is a monopoly for the sale and manufacture—otherwise you deprive language of all meaning. This licence in my hand is the defence. This has nothing whatever to do with patent medicines. This is a stamped medicine licence, and the meaning of it is that it is complying with 52 Geo. III., and that Act was passed for the purpose, as I understand it, of enabling medicines to be manufactured at one place and transmitted to another, and so retailed to the public under the guarantee of the original vendor as to the ingredients, and in that case if you were to carry on a transmitting and re-vending trade, you must have a label which encloses the whole affair. But that applies not only to all patent medicines, but to other nostrums. This defence has been tried before, but it did not succeed. I am sorry that it is only an English case, but really after all the High Court of Justice goes for something. It is reported in the 1893 volume of the Queen's Bench Division, under date February 8, 1893, and on page 686. The case is the Pharmaceutical Society against Piper and Company. The rubric quotes section 15 and also 16, which is what my friend founds upon. "Nothing shall interfere with the business of any legally qualified apothecary"—observe, my lord, that it is peculiar in this section that we are not dealing with the case of a legally qualified apothecary here—"or, secondly, with any member of the Royal College of Veterinary Surgeons in Great Britain." We are not dealing with that case at all, but the third is what my friend founds upon, "Nor with the making or dealing with patent medicines." Now, strangely enough, the case I am going to quote was a case about Dr. Collis Browne's chlorodyne. The rubric is as follows:—"The defendants, a firm of grocers, sold a bottle of proprietary medicine called chlorodyne in the ordinary course of their business. Chlorodyne was not protected by Letters Patent, but was admitted to be a useful medicine. Evidence was given that the bottle contained 1 grain of morphine, the active principle of opium, and that eight-tenths of a grain had been known to prove fatal to an adult. Held, that the prohibition in the Act against the sale of poisons by others than registered chemists was not confined to the sale of the scheduled poisons in their simple state or of the preparations of such poisons, but extended to the sale of a compound containing a scheduled poison as one of its ingredients, and that chlorodyne was a poison within the meaning of the Act. Held, further, that the exception in section 16 in favour of patent medicines extended only to medicines which were the subject of Letters Patent and not to proprietary medicines." (Q. B. D., February, 1893, p. 686). Your lordship will find an important judgment by Justice Lawrence, which is confirmed by Justice Collins. The substance was this Collis Browne's chlorodyne, and Justice Lawrence says:—"It has been contended for the appellants that the term 'patent medicines' includes all medicines dealt with in the schedule, and at first I was impressed with this view of the case; but seeing that the distinction is clearly taken in that Statute (52 Geo. 3, c. 150) between proprietary medicines and medicines protected by Letters Patent, I have come to the conclusion on this branch of the case that the expression 'patent medicine' in section 16 means a medicine protected by Letters Patent under the Great Seal, and, therefore, that the rights reserved under section 16 do not apply in the case of chlorodyne." (Q. B. D., February, 1893, p. 691). Mr. Justice Collins gave a judgment fully concurring in that view, and therefore I submit that the onus is upon my learned friend to show that this is a patent medicine. I have proved that it is a poison, and contains two deadly poisons. It is for him to prove that it is a patent medicine. Unless he discharges that burden of proof his case fails. He says that it is a stamped medicine, and it is for him to show that it is a patent medicine.

Mr. Borland: The expression "patent medicine" must be assumed to have some meaning with reference to a recognised trade. The words of section 16 are, "Nor with the making or dealing in patent medicines." One would not expect an exception in a statute in favour of patent medicines if medicines for which Letters Patent were granted were rare—only one or two isolated medicines for which patents are granted. Two witnesses who have been examined for the defence, both of whom are chemists of long experience, are ignorant as to the granting of Letters Patent for medicines. One of them has heard of two altogether—the patent for one of these having expired some fifty or sixty years ago, and the patent for the other being a matter of doubt. Is it to be supposed that the Statute containing an exception of this kind would introduce an exception in favour of medicine for which Letters Patent were granted unless there was a substantial trade in such medicines? But I have gone further. I have proved by the same two witnesses that it is contrary to the etiquette of the medical profession to have secret medicines at all, and that members of the profession who compound secret medicines are dealt with by their professional brethren as having done something unprofessional. Is it to be supposed that a Statute of this kind would be passed with a special exception in favour of patented medicines when it is the etiquette of the medical profession not to patent their medicine, but to prescribe in language which perhaps many people cannot read, but which sufficiently discloses the ingredients to any person who knows anything about medicine. We look at books to see what is the general meaning of the expression "patent medicine," and it is for that purpose that I refer you to Cooley's 'Cyclopædia,' fifth edition, 1872. Under the head "patent medicine" there is the Latin synonym, *medicamenta arcana*, which may be translated as secret medicines not compounded from a prescription, and there is a great list arranged alphabetically, and I see that Dr. J. Collis Browne's chlorodyne is amongst them. Now I submit that reading the Statute with reference to the use of these patent medicines, one would naturally say that it did not mean patent medicines, because if there are any such they are rare, and the taking out of patents is contrary to the etiquette of the medical profession, and a patent medicine is an expression in the drug trade as covering medicines which are proprietary medicines in the ordinary acceptation of the term, and one would naturally expect the Statute to refer to these, and this is an express authority to sell these medicines. It says that he is hereby authorised to sell all government stamped medicines. There are two Acts, the Revenue Act and the Pharmacy Act, under which he might be brought.

The Sheriff: Has this gentleman, Mr. Miller, a licence?

Mr. Borland: No, but his employer has. In one sense that may come back to the old argument as to the hand, but I am not repeating that argument to your lordship. I am showing you that the business that is carried on is carried on under the protection of a licence which specially authorises the selling of these very things, because it allows the selling of all proprietary medicines. Are we to assume that the two Acts, the Pharmacy Act and the Revenue Act, contradict one another? Then I come to the case which has been cited against me. Everyone has to be judged by the evidence laid before the court, and there is no indication that there was laid before the court any evidence to show that the expression "patent medicine" is recognised in the trade as any equivalent to secret or proprietary medicines, or that it is contrary to the etiquette of the medical profession to have secret medicines, and it is not to be presumed that that is a fact. If that judgment had been pronounced, with such evidence, then your lordship would have been entitled to pay great attention to it, but there is no indication that these two points were before the court, and in the absence of any indication or any information that patent medicines, if any such exist, are extremely rare, I submit that that is not the ruling case on this point.

Mr. Shaw: I have looked through the Act in which patents are referred to in medicines, and that is the Act of 52 George III. regulating stamping. Now the category given is as follows:—"All pills, etc., in which the person vending or exposing the same has or claims to have any occult or secret art of making or preparing the same." The second is this, "Or who prepares, utters, or exposes the same under Letters Patent under the Great Seal." Without a doubt it is out of the question for my friend to say that your lordship is to construe it as if it was rare. The list is a list of nostrums where the person holds himself out or recommends to the public as a maker of nostrums or proprietary medicines. Your lordship will look at the judgment of Mr. Justice Collins, and you will find that he deals with this as covered by the cases, and that the statute of 1868 deals, and deals alone, with the case as competent.

The Sheriff: Gentlemen, in my view I am here in precisely the same position as in the last case. In this case of Piper, which was decided in the Queen's Bench in February of this year, Lord Justice Lawrance and Lord Justice Collins had the exact point, with not a shadow of difference between them. Lord Justice Lawrance says: "I have come to the conclusion that the expression 'patent medicines' in section 16 means a medicine protected by Letters Patent," and Mr. Justice Collins said: "It is said that the expression 'patent medicine' is a rough way of describing medicines that are dealt with in the same way as patent medicines under the legislation relating to stamps, and that there was evidence before the learned County Court Judge that at the time of the passing of the Act in 1868 the term 'patent medicine' was not confined to what is no doubt so described, that is, medicines in respect to which Letters Patent have been granted; but that it meant proprietary medicine, and it was contended that the same meaning should be given to it in this section. I have come to the conclusion, having regard to the object of this Statute, that we should not put on the phrase 'patent medicine' a meaning which would defeat the object of the Act." I think it is out of all question for me to hold an opinion against such distinct expressions of opinion. In this case this gentleman, I do believe, thought that he was keeping to the law, and this case of Piper is only in February of this year, and therefore it is not a case for a penalty. I think if he pays 5s. of a penalty and £2 2s. of expenses that will do.

Mr. Borland intimated an appeal.

The next case called was against James Downie, 114, Clarence Street, Glasgow, for selling oxalic acid on July 28, 1893, he not being a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act.

Mr. Shaw: With regard to this boy Downie, this was the case of the sale of a very bad poison. He is practically an infant, and we have taken it not as against the boy, but as illustrating the careless manner in which this poison is sold in this doctor's shop.

The Sheriff: It is impossible for me to fine in this case, because he cannot pay the fine, but if we were sure that the master would pay it I would consider the matter. I will take the next case.

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The next case called was against William Reid Craig, 114, Clarence Street, Glasgow, for selling oxalic acid on July 28 and 29, 1893, he not being a duly registered pharmaceutical chemist or a chemist and druggist within the meaning of the Pharmacy Act. The accused pleaded not guilty, and was defended by Mr. Borland.

John Rutherford Hill examined, deponed: The name of the accused is not upon the register for 1893. On July 28 and on July 29 I saw the accused sell oxalic acid to Joseph Tait. The packets were analysed by me and found to contain oxalic acid, a scheduled poison. I produce the two packets.

Joseph Tait corroborated the previous witness.

Mr. Shaw: That is my case.

For defenders, Dr. Hugh Kelly, M.B., C.M., Glasgow University, deponed: The shop at 114, Clarence Street, is my shop. As M.B., C.M., I had, in order to obtain my diploma, to pass an examination in pharmacy. The accused, William Reid Craig, is in my employment, and when he sells commodities in the shop he sells them on my account. They belong to me. There are two apartments in the shop. I consult there. The medicines are kept in a back room. I don't think the oxalic acid is kept there. It is kept in the front shop. The front shop is divided into a waiting room for patients and the other part is for dispensing.

Can you say whether the oxalic acid is kept in the front or back division?—There is a bottle of it in the front for sale, and there may be a packet in the back for filling up.

Cross-examined by Mr. Shaw: I have two druggists' shops, and I have four assistants, none of whom are registered. The boy Downie is one of them. He sells medicines, but under the supervision of the older lads. He is supposed always to sell under the supervision of others. He has received instructions not to sell poisons. None of the three are registered under the Act. I have three consulting hours during the day. The shop is open for a round of the clock. I am there for three or four hours a day as against the round of the clock.

Have you any registered assistant or servant at all?—I never thought I required one.

But you have not?—No.

By Mr. Borland: I am a registered chemist and druggist besides being a physician. I passed through an examination for that purpose.

Mr. Shaw: I must press for a large penalty in this case, because I think it everlaps Downie's case, and probably we might dispense with procedure in it. It is quite clear that these cases might have been multiplied a hundredfold.

The Sheriff: It is the case of a gentleman who does not care for the Act at all.

Mr. Borland: It is the same kind of case as Dr. White's. Dr. Kelly understood that his double qualification as a physician and a chemist protected him under the Act of 1869. This gentleman is there at 9 o'clock, again at 1, and again at 6.

Mr. Shaw: He is not engaged in the shop work at all.

The Sheriff: I cannot take into account the boy, because I have no evidence.

Mr. Shaw: He was one of the unregistered assistants, and we will prove that case if your lordship will allow us to take it up.

The Sheriff: I can draw a distinction between Dr. White's case and Dr. Kelly's. This gentleman has done nothing at all. He knows the Act, and he says "That is my interpretation, and I don't care what the decision is in England or elsewhere." You won't bring up the boy. I don't think it is a hardship to fine this gentleman £2 10s. for each offence, with £2 2s. of expenses.

Mr. Shaw: Then I withdraw the complaint in the case of Downie.

The Sheriff: I have taken that into account here.

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The next case was against William Tomlinson, 133, West Scotland Street, for selling oxalic acid on July 28, and for selling prussic acid, opium, and chloroform on July 29, 1893, he not being a duly registered pharmaceutical chemist, or chemist and druggist, within the meaning of the Pharmacy Act.

The accused pleaded not guilty, and was defended by Mr. Borland.

The first witness called was John Rutherford Hill, who deponed: I produce the Register for 1893, and the name of the accused, William Tomlinson, does not appear there. On Friday, July 28, I sent Joseph Tait into the shop of Dr. Kelly, at 133, West Scotland Street, and I told him to buy twopenceworth of oxalic acid. I stood outside the door. The door being open I had a quite distinct view of what was going on inside. I saw the accused weighing out oxalic acid, wrapping it up, labelling it, and handing it to Tait. Tait paid him, and came out and handed the packet to me. There was no one else in the shop. I put my initials in pencil on the packet. I now produce the packet. I analysed the contents, and found them to be oxalic acid. That is a scheduled poison. I put on the packet that docquet and sealed it, and it has been in my possession ever since. When Tait came out I went in, and I purchased a pennyworth of liquorice powder from the accused, so that I am quite certain he was alone. The next day, July 29, I entered the shop and handed the accused a prescription. The original was retained by him, but I have a copy of it in his handwriting. The copy produced is an accurate copy of the prescription that I gave to him. It is a prescription for sodium bicarbonate 2 drachms, bismuth subnitrate 2 drachms, prussic acid ½ a drachm, tincture of opium 2 drachms, spirit of chloroform 2 drachms, water to 6 ounces—1 tablespoonful every four hours. The poisons in that prescription are prussic acid, opium, and chloroform. Tomlinson made up that prescription himself in my presence. I saw him make it up. I saw all that he did. He wrote the label, wrapped up the bottle and handed it to me. I paid him 2s. for it. I now produce the bottle which I got. It was initialled at the time by myself and Joseph Tait. I analysed the contents of the bottle and I found it to contain prussic acid, opium and chloroform. I attached the docquet to the bottle and sealed it. It has been in my possession ever since.

Joseph Tait deponed: Mr. Hill sent me into the Clutha Pharmacy, 133, West Scotland Street, on Friday, July 28, for twopenceworth of oxalic acid. The accused was there alone, and he served me. I saw him take down a bottle, weigh out the oxalic acid, wrap it up and hand it to me. I paid him, and I took the oxalic acid out to Mr. Hill, who had seen the transaction from the outside. The accused told me to keep it away from cuts. I put my initials in pencil on the packet, and I now identify the packet. It was labelled by Mr. Hill and signed by me. I saw Mr. Hill analyse it, the contents being oxalic acid. I went along with Mr. Hill to the same shop on the following day, Saturday, July 29. Mr. Hill showed me the prescription, and I saw him give it to the accused, who dispensed the medicine himself. I saw him hand the medicine to Mr. Hill, and Mr. Hill handed him 2s. He did everything himself. Mr. Hill analysed the contents of the bottle in my presence, and labelled it, and I signed it.

For the defence, Dr. Hugh Kelly deponed: The shop at 133, West Scotland Street, is my shop. One person is ordinarily employed in it, and he is George White. The accused, William Tomlinson, relieves him for his meals. William Tomlinson is ordinarily employed in my other shop in Clarence Street. He is an apprentice learning his trade with the view of becoming a chemist and druggist. I have been in business as a chemist and druggist for about nine years.

Is it within your knowledge that medical practitioners in Scotland were in the habit of keeping drug shops both before and since the passing of the Act?—It is within my knowledge all over the west of Scotland that they have been keeping drug shops, and it was never questioned before. I know also what apothecaries are in England. They have drug shops, and they also prescribe. To that extent they carry on a business similar to that of a doctor in Scotland who has a drug shop. I also know that students in pharmacy require experience in dispensing drugs. Students who have to pass the examination of the Pharmaceutical Society must have a certificate that they have served three years in a practical dispensary, dispensing prescriptions which may or may not contain poisons. They require to show their expertness as one of the tests under examination, in terms of the printed particulars produced.

Cross-examined by Mr. Shaw: Is it the object of medical students practising to avoid mistakes so that they may not give out poisons in place of harmless drugs?—It is to give them familiarity with drugs and to see that they do the right thing.

If there is no one to superintend them when they are learning their business, is there a chance that they may do a wrong thing?—Now-a-days they have classes for medical students. The lad Tomlinson was not a medical student; he was a pharmaceutical apprentice. I have two shops, and in none of them is there any registered assistant. Tomlinson is about seventeen, I think, and he has been employed with me for nearly four years. It is only within the last twelve months that he has been allowed to dispense. He has been dispensing since he was fifteen, under supervision of the others.

What was the supervision in this case?—There was no supervision here.

Do you think that is right?—Yes, I would have no hesitation in taking a prescription dispensed by him.

Mr. Shaw: If any mistake had happened you would have been in a very bad position, and I hope you will stop it. Do you mean to stop?

Mr. Borland: We mean to test the legality of this practice, and I submit that that is not a proper question. If they get a judgment against us we will stop it.

By Mr. Shaw: Did this man White get holidays? -Yes, in the summer time.

Was he getting holidays at that time?—I don't remember whether he was or not.

By the Sheriff: Was this boy really acting for White at his dinner and tea?—Yes, and he also acted for White when White was away for his holidays.

The Sheriff: What have you got to say to that, Mr. Borland?

Mr. Borland: This is the same kind of case as the other, except that here we have an apprentice who has had four years' experience, more or less, before this thing occurred.

The Sheriff: Are you going to support this position—that poisons are to be dispensed by a boy, however wise he is? Is it not one of these cases showing the good that the Act is intended to do? How old are you, Tomlinson?

The Accused: I am seventeen years old in March next.

Mr. Borland: For the life of me I cannot see the object of the Act where we are dealing with 1d. or 2d. worth of oxalic acid. We are not just now dealing with the case of a person who is asked for something that is not a poison, and may sell something that is, but we are dealing with a person, whether qualified or not qualified, who is asked to sell 2d. worth of oxalic acid, a well-known poison, known both to the seller and the purchaser, and he sells it, and sells it correctly. If you do put the question to me I do not see that there is any object whatever in a person who simply sells oxalic acid by the pennyworth having any qualification whatever.

The Sheriff: I am perfectly with you, but that is no argument.

Mr. Borland: But your lordship asked me the question, and it turned out that the best test of all is that it is correctly dispensed. This boy turns out to be so well acquainted with his duty that he correctly copies the prescription and hands his copy to the purchaser, who takes it to another shop, so that not only have we a correct copy of the prescription, but the correct dispensing of it. I submit that we could not have better evidence, unless we are limited to the capacity of having passed the examinations under the Act.

Mr. Shaw: In a single word, this case is about as serious as any one could be under the Statute. If it had been a case in which a mistake had occurred, probably fatal or extremely harmful, it would have been in another court altogether, and it is highly creditable that this lad should be able to do this without mistake; but is this system to reach a stage which is absolutely intolerable, as a defiance of the Statute and as a defiance of its most salutary provisions? I point out in one word that the four poisons given by a lad of sixteen are oxalic acid, prussic acid, opium, and chloroform. I ask your lordship to apply the full penalty, well knowing that the master must pay, and I think your lordship might make a judicial note of the real danger that has been exposed.

The Sheriff: I am quite with Mr. Shaw. I think this is a very bad case indeed, and I think this gentleman, Dr. Kelly, did not care anything for the public safety; but I must take into account that I have already fined him £7 in Craig's case, and he must pay a guinea for each of the offences here, and the expenses, £2 2s.

Mr. Borland intimated that the case would be appealed.

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The next case called was against Robert Fleming, grocer, 117, Houston Street, Glasgow, who was charged with selling a bottle of Dr. J. Collis Browne's chlorodyne, containing chloroform and morphine, he not being a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the Pharmacy Act.

Mr. Borland, who appeared for the accused, said: In this case I think I may withdraw the plea of not guilty, and plead guilty. This is a chlorodyne case, and I have nothing new to urge, and I am not going to appeal this case, because the accused is a grocer, who thought that his licence to sell patent medicines covered the sale of chlorodyne. He is willing to give up selling chlorodyne. He holds a licence to sell patent medicines, and just mistook this, not knowing the contents of it.

The Sheriff: Can you admit that, Mr. Shaw?

Mr. Shaw: I think so, with one explanation, that so far I believe this is a test case in the proper sense. It is the first case of a grocer in Scotland, and I was going to suggest that there should be a nominal penalty in this case.

Mr. Borland: If this thing had been labelled poison, as I submit it should have been, it would have warned my client not to sell it.

The Sheriff: But you take Mr. Miller's case as a test case on that point.

Mr. Borland: Yes.

The Sheriff: I think this should be the same as Mr. Miller's, 5s. and expenses two guineas.

The Court then rose.

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### PROSECUTIONS UNDER THE PHARMACY ACTS AT AIRDRIE.

On Tuesday, November 28, in the Sheriff Summary Court, Airdrie, Sheriff Mair heard two complaints at the instance of Richard Bremridge, 17, Bloomsbury Square, London, W.C., Registrar under the Pharmacy Acts, 1852 and 1868.

Mr. Robert Watt, solicitor, conducted the prosecution.

The first case was against Robert Revie, grocer, 80, South Bridge Street, Airdrie, who was charged with keeping open shop for the sale of poisons on September 12, 1893, when he sold a bottle of Dr. Bow's liniment, containing opium, to Joseph Tait.

Mr. John A. Russell, solicitor, appeared for the respondent, who pleaded guilty.

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The second case was against Alexander H. Smith, grocer, 22, South Bridge Street, Airdrie, who was charged with keeping open shop for the sale of poisons on October 24, 1893, having sold a bottle of Dr. J. Collis Browne's chlorodyne, containing morphine and chloroform, to Joseph Tait.

Mr. John M. Macfarlane, solicitor, appeared for the respondent, who pleaded guilty.

The Sheriff, after consideration, and in view of the fact that these were the first prosecutions of the kind in the district, inflicted on each of the respondents a nominal penalty of *5s.* and £2 *2s.* of expenses.

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### POISONING BY CARBOLIC ACID.

In the House of Commons, on Friday, November 24, Mr. Macdona asked the Secretary of the Local Government Board whether he was aware that since February, 1892, to November, 1893, there had been 230 deaths due to the taking of carbolic acid, 174 of which were suicidal and 56 accidental; whether the Government would place carbolic acid under the Pharmacy Act, so that there might be greater restrictions placed upon its sale in small quantities; whether he would instruct coroners in certifying the cause of suicides to certify the name of the poison which caused the death; and whether he would order a return of the number of deaths caused by carbolic acid during the last five years to be placed upon the table.

Sir W. Foster, in reply, said I have no information as to the number of deaths due to the taking of carbolic acid between February, 1892, and November, 1893, except that which the hon. member has been good enough to furnish. The Local Government Board has no jurisdiction with regard to the articles which are to be deemed poisons for the purpose of the Pharmacy Act, 1868. Additions to the articles specified in the schedule may from time to time be made by resolution of the Pharmaceutical Society, with the approval of the Privy Council, and the Board will bring the matter under the attention of that Society. The Board has no jurisdiction with regard to coroners, and is not empowered to issue any such instructions as the hon. member suggests. As regards the return, I have been in communication with the Registrar-General and understand that the particulars cannot at present be furnished for a later period than 1891. If the hon member moves for a return for the five years from 1887 to 1891 it will be granted.—*Times.*

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### LIMITED COMPANIES AND THE PHARMACY ACT.

On Friday, November 24, at the Birmingham County Court, before Registrar Cole, Albert Tibbatts, druggist and drysalter, 165, Summer Lane, appeared for his public examination in bankruptcy. Mr. G. L. Price represented the bankrupt, whose statement of affairs showed liabilities £180, assets £20.

Replying to questions by the Assistant Official Receiver (Mr. Woollett), bankrupt stated that he was an assistant to a druggist until 1887, and in that year, having reached the age of 22, he commenced business on his own account in Summer Lane. He had no capital. He removed to his present premises in Summer Lane in 1892, and opened a shop, the rent of which was 8s. 6d. a week. Not long subsequently he was served with a notice by the agent of the Pharmaceutical Society that he would be summoned for selling poisons without being a registered chemist. To avoid legal proceedings he paid the penalty of £10. Owing to the threat by the Society he converted the business into a company.

The Registrar: I suppose it was easier to convert yourself into a limited liability company than to pass the examinations of the Pharmaceutical Society?

Bankrupt replied in the affirmative, and added that the company was formed on July 30, 1892.

In answer to a question by Mr. Woollett, bankrupt said he had not the assistance of a solicitor in the formation of the company.

Mr. Woollett: Then did you understand the Companies Act?

Bankrupt: I did not thoroughly understand it. A friend assisted me to fill up the papers. Proceeding, he said his friend was named Thomas Young. Young had formed his own business into a company, and bankrupt borrowed his forms and altered them. He forgot to scratch out Young's name in one place, and so the form read that he was to be managing director "subject to the appointment of the said Thomas Young."

The Registrar: Assuming you had a doctor's prescription to make up, should you make the same kind of mistake and put arsenic in instead of some innocent conpound?

Bankrupt: We never undertook to dispense medicine; we declined to. Continuing, in answer to Mr. Woollett, the bankrupt said the capital of the company was £1,000 in £1 shares. He took 994 shares, and six of his relations and friends took the other six, and paid for them. The book containing the register of shareholders cost him one penny. He entered the six holders of shares, and forgot to enter his own 994. He had no scrip printed nor seal made. The stock was valued at about £1,000 at the time the company was formed, and he owed about the same amount. As managing director he was to receive 30s. a week. He did not give a receipt to the company when he took his fees or salary; he simply entered them as wages.

The Registrar: Wages, dear me, that would be coming down. Surely you would not call directors' fees or salary wages?

Mr. Woollett asked if there was any meeting of directors or shareholders when his remuneration was fixed, to which bankrupt replied that there was a meeting at the commencement of the company of his relations, and they fixed it with his assistance.

The Registrar: Where did you meet?

Bankrupt: At my house, sir.

The Registrar: A family party?

Bankrupt: Yes, sir.

Further questions elicited the statement by the bankrupt that no minutes were kept of the transactions of the shareholders. The company was not a success, and he had been sued from time to time. When he was out the place was managed by his assistants—two or three boys. He never drew more than the 30s. out of the business. He never paid a tailor's bill or anything of that kind out of the company's money.

The Registrar: Would it not have been rather difficult to pay a decent tailor's bill out of the assets of the company?

Bankrupt said he thought perhaps it would.—The examination was concluded.—*Birmingham Daily Gazette.*

### POISONING BY CAMPHORATED CHLOROFORM.

On Tuesday, November 21, a man named Arthur Morley, a painter, living at 11½, St. Mary's Gate, Derby, who had, it appears, been suffering severely from toothache, bought a mixture of camphor and chloroform to ease the pain, but outward application having no effect he took a dose. He immediately became ill, and a doctor was called in, but the unfortunate man gradually became worse, and died from the effects of poisoning.—*Nottingham Daily Guardian.*

### PROCEEDINGS UNDER THE FOOD AND DRUGS ACT.

#### DEFICIENT TINCTURE OF RHUBARB.

At the Skipton Petty Sessions on Saturday, November 25, before Mr. J. Coulthurst and other magistrates, Christopher Barker, grocer, of Glusburn, was charged on the information of Mr. A. Randerson, inspector under the Food and Drugs Act, with selling adulterated tincture of rhubarb. In fining the defendant 20*s.* and costs the Bench strongly reprimanded him, remarking that adulteration of this kind might lead to serious results. Any future case of this nature would be dealt with severely.

## Obituary.

Notice has been received of the death of the following:—

On the 17th of November, Charles Bromley, Chemist and Druggist, Oxton. (Aged 72 years).

On the 22nd of November, John Hall, Chemist and Druggist, late of Gainsborough. (Aged 60 years).

On the 23rd of November, E. Richard Jones, Chemist and Druggist, Liverpool. (Aged 42 years).

On the 19th of November, George T. Prior, Pharmaceutical Chemist, Oxford. (Aged 83 years). Mr. Prior had been a Life Member of the Pharmaceutical Society since 1853.

On the 26th of November, William Luff, Pharmaceutical Chemist, Oxford. (Aged 83 years). Mr. Luff had been for a long time associated with the staff and work of the Radcliffe Observatory as Computer to that establishment, and performed the greater part of the calculations in the first Radcliffe Catalogue of Stars.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Ashton, Duncan, Hornsby, Mumbray, Parker, Reynolds, Stead.

## Correspondence.

### ETHICS.

Sir,—As you have brought forward the above subject, I should like to propose that the Council of the Pharmaceutical Society draw up a code of ethics for its members and associates. In that code I should consider any member or associate hiring himself out to any company, stores, or grocer, as guilty of "infamous conduct," and expel him from the Society. Further, if the Pharmaceutical Society could get the power to make its code binding on all registered men I would strike him off the Register. Is it possible to effect this?

*Stockport.* WM. BILLING ORTON.

*A. F. Brookes.*—Your letter should have been addressed to 17, Bloomsbury Square and not to Serle Street.

### NOTICES OF MEETINGS NEXT WEEK.

#### MONDAY, DECEMBER 4.

*Society of Chemical Industry (London Section)*, at 8 p.m.
"Application of Air in Motion to Chemical Industry," by H. G. Watel.
"Note on the Copper Mines of Singhbhoom," by H. Harris.
"The Product of the Action of Mercuric Chloride upon Metallic Silver." By Chapman Jones.

*London Institution*, Finsbury Circus, at 5 p.m.
"When and Why an Electric Spark Oscillates." By Professor C. V. Boys.

*Society of Arts*, John Street, Adelphi, at 8 p.m.
"The Various Methods of Reproducing Drawings and Photographs for the Press." By Henry Blackburn.

#### WEDNESDAY, DECEMBER 6.

*Edinburgh Chemists' Assistants' Association*, at 9.15 p.m.
Meeting. Arrangements by J. W. Simpson.

*Nottingham and Notts Chemists' Association*, at 8.30 p.m.
Annual Dinner at the Masonic Hall.

*Brighton Junior Association of Pharmacy*, at 9 p.m.
Examination on Pharmacy.

*Society of Arts*, John Street, Adelphi.
"An Artist's View of Chicago and the World's Fair." By Frederic Villiers.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Sponges and their Life-History." By T. S. Wokes.

#### THURSDAY, DECEMBER 7.

*School of Pharmacy Students' Association*, at 7 p.m.
"Bees." By A. T. Hill.
"Commercial Jalap and Jalapin." By C. E. Robinson.

*Chemists' Assistants' Association*, at 8.30 p.m.
"The Pharmacist as a Man of Science." By C. M. Luxmoore.

*Glasgow Pharmaceutical Association*, at 9.15 p.m.
"Parasites and their Habits." By Dr. G. Bell Todd.

*Chemical Society*, at 8 p.m.
Ballot for the Election of Officers.
"An Apparatus for the Determination of the Gases Dissolved in Water." By Dr. Truman.
"Metallic Oxides and the Periodic Law." By R. M. Heeley.

#### SATURDAY, DECEMBER 9, at 3.15 p.m.

*Pharmaceutical Football Club v.* Charing Cross Hospital at Shepherd's Bush.

*Reserves v.* Lovey's Athletic at Walthamstow.

### BOOKS, ETC., RECEIVED.

PROCEEDINGS OF THE CHEMISTS' ASSISTANTS' ASSOCIATION. 1892-93. No. IX. London: R. O. Hearson. Pp. 126. 2*s.* 6*d.* From the Secretary.

THE A. B. C. POCKET DIARY AND MEMORANDUM BOOK FOR PHYSICIANS AND PHARMACISTS, 1894. London: Burroughs, Wellcome and Co. From the Publishers.

EDINBURGH MEDICAL SCHOOL CALENDAR AND GUIDE TO STUDENTS, 1893-94. Edinburgh: E. and S. Livingstone. Pp. 311. 2*s.* From the Publishers.

BIBLIOGRAPHIE DES SCIENCES CHIMIQUES. Paris: J. B. Baillière et fils. Pp. 64. From the Publishers.

THE BRITISH AND COLONIAL DRUGGISTS' DIARY, 1894. From the Publishers.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, DECEMBER 9, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE COUNCIL MEETING.

LAST Wednesday, at the concluding meeting of the Council for the present year, the routine business was preceded by references to the deaths of an honorary member, a member of the Board of Examiners, a founder, and one of the first students connected with the Society's School of Pharmacy. In that order the PRESIDENT spoke of Professor TYNDALL, Mr. R. H. DAVIES, Mr. PEDLER, and Mr. G. B. FRANCIS, giving brief records of their careers, and proposing that resolutions of regret for their loss should be placed on the minutes of the Council proceedings.

The first ordinary business was the appointment of examiners to constitute the Boards for England and Wales and for Scotland for the ensuing year. The only change on the English Board is the addition of Mr. E. WHITE, of St. Thomas's Hospital, in the place of the late Mr. DAVIES. In the Scottish Board the positions rendered vacant by the retirement of Messrs. KINNINMONT and STEPHENSON have been filled up by the appointment of Mr. J. I. FRASER, of Edinburgh, and Mr. J. W. SUTHERLAND, of Dumfries. In acknowledgment of the long services of the two retiring examiners, a vote of thanks was proposed by the PRESIDENT, seconded by Mr. JOHNSTON, and carried unanimously.

An additional number of local and divisional secretaries were appointed, together with the Superintendents of written examinations, and it was resolved that the London and Edinburgh Superintendents should, in future, supervise the Major written examinations.

In moving the adoption of the report and recommendations of the Finance Committee, the PRESIDENT remarked that the receipts and payments were of the nature usual at this period of the year. In connection with the Benevolent Fund a number of subscriptions had been received from persons desirous of helping certain candidates to obtain annuities. The balance in hand on this account amounts to barely sufficient for the payment of annuities falling due in January, a fact which it may be useful to make known. The receipts for the donation account include half of the legacy bequeathed by the late Mr. BARKER, and a sum of fifty guineas from the directors of the Chemists' Aerated Mineral Water Company, of which Mr. HORACE DAVENPORT is Chairman.

On the recommendation of the Benevolent Fund Committee, one grant of ten pounds and two grants of five pounds each were ordered to be paid. In reference to the case of four annuitants who have recently received legacies, it was recommended that, in consideration of that circumstance, the amount of the annuity should in one instance be reduced to thirty-five pounds. In order to deal with similar cases in future, the SECRETARY has been requested to draft a scheme for that purpose. In speaking on this subject, the VICE-PRESIDENT said the new departure would probably evoke some feeling, but he thought the course taken was just as well as generous. From the increased amount of the annuities granted and the limited capability of the Committee to afford relief, it became necessary to take advantage of every means of doing the greatest amount of good to the largest number, and for that reason the Committee had practically agreed upon the principle recommended as the guide for future action. Mr. BOTTLE formally seconded the motion. He also added, in regard to the purchase of votes for securing the election of candidates, that he knew much good had come of the practice, and that it had been the means of adding to the number of permanent subscribers to the Fund. The TREASURER also agreed with the principle of the new rule, and the recommendation was unanimously adopted.

The subject of granting prizes to students during their apprenticeship was then brought forward by Mr. MARSHALL LEIGH, who advocated the adoption of the plan as a more satisfactory return for the half-guinea a year contributed by registered students than a copy of the Society's Journal, which, he thought, was not of much use to them, as it contained scientific papers which they could not understand. He wished to have a students' page written every week by the teachers connected with the Society's School, and, in support of his proposition that prizes should be offered, he referred to the remarks made by Professor CLOWES at the Conference meeting in Nottingham last August. The motion was not seconded.

The subject of a code of ethics relating to the practice of pharmacists was raised by a letter from the Chemists' Assistants' Association, forwarding a resolution passed at a recent meeting. The PRESIDENT remarked that the feelings of their younger brethren would probably be appreciated by the Council, and personally he hoped it would eventually be possible to establish a code of ethics, though it was a difficult matter to do so under existing circumstances. Until the

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Council has power to remove persons from the Register for irregular conduct the subject could not be approached officially. At the same time he thought it was within the power of members of the trade, and especially the younger members, to adopt an ethical code which might be beneficial in the future, and spontaneous action in that manner would be more effectual than any plan formulated by the Council. Mr. Atkins thought the proposal highly creditable to the members of the Chemists' Assistants' Association, and suggested that it should be referred to a committee for consideration, as he had often felt the desirability of removing from the Society members who were not worthy of being connected with it. The Vice-President also thought the discussion of the subject would be good for chemists and druggists, and supported Mr. Atkins' suggestion of reference to the Library Committee, which was unanimously agreed to.

A letter received from the Local Government Board in reference to the sale of carbolic acid, and enclosing copies of the question put by Mr. Macdona to the President of the Board in the House of Commons on the 24th ult., and of the reply of Sir Walter Foster on that occasion, raised a discussion which resulted in a motion by the President that carbolic acid ought to be deemed a poison within the meaning of the Pharmacy Act, 1868, and added to the second part of the poison schedule. This was seconded by the Treasurer and carried unanimously. In the course of the discussion the President pointed out that the sale of such a powerful poison in all sorts of vessels was a great source of danger, and he thought it would be appropriate to exercise the power vested in the Council for the protection of the public, notwithstanding the usefulness of carbolic acid as a disinfectant. He also instanced the case of corrosive sublimate as showing that the fact of a substance being included in the schedule does not prevent its being obtained and used as a disinfectant under proper precautions. Several other members of Council spoke of the unregulated sale of carbolic acid as an anomaly of the most dangerous nature, and they agreed that it was incumbent on the Council to approach the Privy Council on the subject.

The President communicated to the Council that he had received from Professor Attfield a letter stating that the Pharmacopœia Committee of the Medical Council had recommended the preparation of another edition of the British Pharmacopœia, and that the Medical Council had adopted that recommendation. In a report presented to the Medical Council on the 4th, Sir Richard Quain speaks of this action as the first step towards the issue of the next edition of the British Pharmacopœia, and Professor Attfield has been invited to continue his services as reporter and editor. The papers laid before the Council on Wednesday show that the new issue will have three prominent features of interest for pharmacists. In the first place the Pharmacopœia is to be extended so as to have an imperial character. That is to be accomplished by the aid of the medical and pharmaceutical authorities of India and the Colonies, and with that object the Medical Council has corresponded with the India Office and the Colonial Office through the Lord President of the Privy Council to ascertain what changes, if any, could be effected in order to make the next edition of the British Pharmacopœia better suited to the requirements of India and the Colonies. Secondly, the Council of the Pharmaceutical Society will be requested by the Medical Council to assist in the compilation of the work in its new and extended form; while, lastly, the medical part of the work will be done by the Pharmacopœia Committee of the Medical Council, and the pharmaceutical portion will be done by the Pharmacopœia Committee appointed by the Pharmaceutical Council.

The satisfaction expressed by the President and other members of the Council at the progress thus made in regard to the matter of Pharmacopœia compilation will no doubt be shared by pharmacists generally, and it may be expected that the results achieved under the new arrangement will be productive of advantage in every way.

The report of the General Purposes Committee gave an account of the progress made with cases in the hands of the Society's solicitors. Several penalties have been recovered, and several persons proceeded against paid penalties without the cases going into court. On the recommendation of the Committee proceedings were ordered in a large number of cases of infringement of the Pharmacy Act.

The Committee was also empowered to consider the conditions under which the Board of Examiners are appointed, and to report what changes are advisable.

## BENEVOLENT FUND ELECTION.

A meeting for the election of four annuitants on the Benevolent Fund of the Pharmaceutical Society will be held on Tuesday next, at 12 o'clock precisely. There are eight names on the list of selected candidates, and it may be well to point out that persons subscribing to the Fund on or before the day of election will be entitled to vote on this occasion.

## PHARMACEUTICAL FOOTBALL CLUB.

The members of this club, which practically includes the whole of the students attending the Pharmaceutical Society's School of Pharmacy, will hold their second annual smoking concert at the Freemasons' Tavern, on Tuesday next, when it is expected that the chair will be taken by Mr. Michael Carteighe, President of the Society.

## JOHN TYNDALL, D.C.L., LL.D., F.R.S.

By the death of Professor Tyndall on Monday last, at the age of 73, is severed the main connecting link with Faraday, as a scientific investigator and lecturer, and the Pharmaceutical Society loses one of its most distinguished honorary members. The son of a poor tradesman, who recognised the value of a prolonged elementary education, Tyndall did not leave school until he was nineteen. Having acquired a fair knowledge of mathematics, among other subjects, he then served for five years in a division of the Ordnance Survey, and, afterwards, was engaged in railway engineering work for some time. In 1847 he was appointed to a post at Queenswood College, Hants, where Dr. Frankland was then chemist, and the following year accompanied the latter to the University of Marburg, to work under Bunsen. Subsequently, he spent some time in the laboratory of Magnus, at Berlin, and in 1850 first became acquainted with Faraday, with whom he became associated, as Professor of Physics at the Royal Institution, three years later. Tyndall was appointed Resident Director of that Institution at Faraday's death, and only retired from the position a few years ago. Amongst his numerous works, the best known are probably the "Forms of Water," "Heat as a Mode of Motion," "Fragments of Science," "Faraday as a Discoverer," "Lectures on Light," and his lecture on "Dust and Disease." He conclusively proved the inaccuracy of experiments which were claimed to establish the fact of the spontaneous generation of living beings, and undertook a large number of investigations on a variety of physical subjects. During his earlier career he held several public appointments; he became a Fellow of the Royal Society at the early age of thirty-three; whilst, later, honours were showered upon him by the great universities and other learned bodies at home and abroad.

## A CORRECTION.

By an unfortunate confusion, the name of Mr. George T. Prior, Local Secretary of the Pharmaceutical Society at Oxford, was wrongly mentioned in the obituary column, in some copies of last week's Journal. Mr. Prior—who is in his usual state of good health and, as one of the Vice-Presidents of the British Pharmaceutical Conference, may be expected to welcome that body to Oxford next year—informed the Registrar, Mr. Richard Bremridge, of the death of Mr. William Luff (see page 480). Intimation of this fact was duly notified to the Editor, but, in the preparation of the matter for the printer, the name of the informant was inadvertently confused with that of the deceased. Arrangements have now been made which should prevent any risk of similar errors in future, and this opportunity may be taken for stating that much trouble will be saved, and the greater accuracy of the Register ensured, if all notifications of the death of pharmaceutical chemists and chemists and druggists be sent, in the first instance, to the Registrar, at 16, Bloomsbury Square, W.C. All such information will then be properly recorded and notified to the editorial department and, if received before midday on Wednesdays, will be published in the Journal the same week, unless excluded by pressure of other matter.

## EVENING MEETING IN LONDON.

As announced last week, the second evening meeting of the session will be held on Wednesday next, when a paper will be read by Mr. N. H. Martin, on "The Pharmaceutical Meetings at Chicago in 1893, with some Notes on American Pharmacy." Mr. Martin's personal experiences as a delegate from the Pharmaceutical Society to the American Congress entitle him to speak with some authority upon the matters he will deal with, and he may reasonably anticipate a large attendance at the meeting.

## THE ROYAL SOCIETY.

The anniversary meeting of the Royal Society was held at Burlington House on St. Andrew's Day, November 30, when the medals were distributed; the Copley Medal being this year awarded to Sir George G. Stokes, for researches and discoveries in physical science; the Davy Medal to Professor J. H. Van't Hoff and Dr. J. A. Le Bel, in recognition of their introduction of the theory of asymmetric carbon and its use in explaining the constitution of optically active carbon compounds; and Royal Medals to Professor Arthur Schuster, F.R.S., for spectroscopic researches, etc., and to Professor H. Marshall Ward for investigations into the life history of fungi and schizomycetes. Lord Kelvin was re-elected President of the Society; the Secretaries are Professor Michael Foster and Lord Rayleigh, whilst Professors J. S. Burdon Sanderson, T. E. Thorpe, and W. A. Tilden are amongst the members of the Council.

## PHARMACY AT THE CAPE OF GOOD HOPE.

The first issue of "The Medical and Pharmacy Register for the Cape of Good Hope" has just been published under the joint direction of the Colonial Medical Council and the Colonial Pharmacy Board, constituted under the Medical and Pharmacy Act, 1891. The Register contains the full text of this Act and the rules and regulations framed under it; together with reports of the Medical Council and Pharmacy Board for 1892; and lists, corrected up to June 30 last, of licensed medical practitioners, dentists, chemists and druggists, certificated midwives, and trained nurses. The Colonial Pharmacy Board consists of a president, secretary, and five other members. Two of the members are nominated by the Governor of the Colony, one is deputed by the Colonial Medical Council, and three are elected by the chemists and druggists of the Colony, one of the present elected members being Mr. W. K. Mager, who holds a British qualification, and will be remembered as a visitor to this country during the past summer. There appears to be only one grade—that of chemists and druggists—recognised in the Colony, and the certificates of the Pharmaceutical Societies of Great Britain and of Ireland are accepted by the Board as sufficient evidence of the competency of any person holding the same to practise as a chemist and druggist in the Colony, without further examination.

## INTERNATIONAL MEDICAL CONGRESS.

We are informed by the Clerk of the Privy Council that the eleventh International Medical Congress will be held in Rome from March 29 to April 5, 1894.

## EVENING MEETING IN EDINBURGH.

An evening meeting of the Society will be held in the Society's House, 36, York Place, Edinburgh, on Wednesday next, December 13, at 8.30. The chair will be taken by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch, and the following communications will be read:—"Notes on (*a*) the Tests for Eucalyptus Oil, (*b*) A Preparation of Iron, (*c*) The Standard Temperature for Specific Gravity," by D. B. Dott, F.I.C., F.R.S.E.; "Note on Liquefied Carbolic Acid," by Peter Boa; "Some Bazaar Drugs from Burmah," by Alex. Sutherland. Additions to the Museum will also be exhibited by the Assistant Secretary, Mr. J. Rutherford Hill.

## LAWES AND GILBERT.

The Director-General of the Columbian Exposition has forwarded to England a special resolution, passed by the Association of American Agricultural Colleges and Experiment Stations, expressing the value attached to the agricultural exhibit of Sir John Lawes and Sir Henry Gilbert. These gentlemen are also thanked by the Director-General for "the great benefit done to American agriculture by this excellent and instructive exhibit."

## MANCHESTER PHARMACEUTICAL ASSOCIATION.

It has been decided to establish an annual ball in connection with this Association, and the first of the series will be held at the Hulme Town Hall, Manchester, on Wednesday, January 17, at 7.30 p.m. There will also be a musical promenade, the music being furnished by Messrs. Forsyth's band. Particulars regarding tickets, etc., will be furnished on application to the honorary secretary, Mr. A. Blackburn, 7, Exchange Street, Manchester.

## THE SUPPLY OF DRUGS FROM INDIA.

The *Lancet*, quoting from the *Pioneer Mail* of the 2nd inst., points out what important results the cultivation of medicinal plants in the Botanical Gardens in India may lead to in the future. Native-grown hyoscyamus, taraxacum, and jalap are said to be supplied to the Medical Department in India at lower prices than they can be procured at elsewhere, and it is thought that an export trade in drugs from cultivated plants may one day be carried on with Europe. Allusion is also made to Dr. Watts's suggestion that a trade in Indian podophyllin might be established in the Simla district and other parts of the Himalayas, of which the plant is a native.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

The ninth volume of proceedings of this Association contains the papers, discussions, etc., for the session 1892–93. The more important of these papers have already appeared at length in the pages of the Journal, whilst others have been summarised there, the summaries in certain cases being adopted by the Committeeo of Publication of the Association. We note, however, that Professor Green's valuable paper on "Vegetable Ferments" is distinguished by receiving no attention beyond an intimation of the fact that it was read, followed by a reprint of our report of the discussion that followed. This can hardly be regarded as satisfactory treatment in a work professing to give "full particulars of the meetings held during the session."

## PHARMACEUTICAL PRELIMINARY EXAMINATIONS.

At the recently held Preliminary examinations of the Pharmaceutical Association of the Province of Quebec, out of forty-one candidates who presented themselves, only one was fully successful. The subjects of examination are English, French, Latin, arithmetic, geography, and history. Two passed in all subjects but history, and will be required to present themselves at the next examination for that subject only, whilst two who had previously been placed in a similar position passed in the remaining subject on this occasion. Commenting on these results, the *Canadian Pharmaceutical Journal* remarks that there is no doubt but such strictness is in many cases a kindness to the candidate, who is prevented, at the outset, from entering upon a course for which he is unfitted. As a contrast, it is stated that much greater facilities are offered to candidates in the neighbouring Province of Ontario, though it is urged that the interests of the licensing department, and of druggists in business, demand a high standard for apprentices, and vigorous regulations as to examinations, as the effect would be that better men would enter the field and their number be much reduced.

## DANGERS OF ANTISEPTIC TABLETS.

Some time ago we drew attention to the fact that corrosive sublimate was being prepared for use for antiseptic purposes in compressed tablets. At first these were supplied uncoloured but, as a precaution against accident, the various makers subsequently coloured them. Even then, however, there appeared considerable risk of misadventure if the tablets got into the hands of others than medical men and pharmacists, and the report of a poisoning case in New South Wales, quoted by the *Pharmaceutical Journal of Australasia*, fully justifies any anticipations of evil on this account. According to the particulars of the medical man attending the case, four sisters, aged respectively 18, 9, 5, and 3 years, swallowed some tablets each of which contained about two and a half grains of sublimate. The eldest girl swallowed three, and as a result was violently sick during the whole day, whilst experiencing the ill-effects for several days. The young children were also very sick, one of them being for a time almost collapsed and apparently moribund, but they began to improve in about twelve hours time and, ultimately, all the patients recovered, by the aid of prompt remedial measures. It is pointed out by the doctor that there will always be a risk of similar cases whilst poisons are made up in tablets so exactly similar to certain lozenges, and the question arises whether it is advisable to supply dangerous antiseptics in this form or, if so, whether they should ever be supplied to the general public.

## INDEX OF CHEMICAL LITERATURE.

We have received from the publisher (H. Bechhold, Frankfort) information concerning an "Index der gesammten chemischen Litteratur" which it is proposed to publish monthly, commencing at the beginning of next year, under the editorship of Dr. Julius Ephraim, of Berlin. It will deal with all papers published, in both pure and applied chemistry, and at the end of each year a separate index for the year will also be published.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, December* 6, 1893.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Abraham, Allen, Atkins, Bottle, Greenish, Grose, Hampson, Harrison, Hills, Johnston, Leigh, Martin, Martindale, Richardson, Schacht, Southall, Storrar, and Young.

The minutes of the last meeting were read and confirmed.

### THE LATE PROFESSOR TYNDALL.

The **PRESIDENT** said the members of Council would have all observed that a distinguished honorary member of the Society—Professor Tyndall—died on Monday evening. The work of this distinguished man had probably produced as much effect upon the advancement of all branches of knowledge as that of any other man in past years, if not even more. Professors Tyndall and Huxley by their lectures, by their extremely fortunate gifts in other directions, and above all by the mighty power of their pens, had succeeded in causing the British public and the press to recognise that there was at least a form of knowledge—called science—which used to be neglected in the English universities. When the history of the Victorian era came to be written it would be found that these two men had contributed probably more than all the other scientific men put together. It would be presumptuous for him (the President) to refer to the distinguished attainments and the brilliance of Professor Tyndall as a lecturer, or to the extremely delightful way in which he could talk to an apparatus and make it speak, as it were, at the right time, and delight an audience of adults or children. He had known Professor Tyndall in his best days, and had listened to him upon many occasions, and he always considered him the finest lecturer on experimental science that it was possible to conceive. The charm of his writings was known to all. Those who did not read anything with regard to Alpine literature scarcely knew some of the works which he had written on the glories of mountaineering expeditions. These works were regarded by athletes as great achievements in physical work. During all his mountaineering days, he used his great power as a climber for the purpose of making notes on the natural phenomena surrounding him, and always showed his intense love for the mountains, and a desire to make use of advanced natural knowledge. He was sure that the Council would unanimously pass a resolution expressing regret for the death of the Professor, and authorise the sending of a letter of condolence to Mrs. Tyndall in her sad bereavement. The activity of the professor's mind, and the nervous energy which seemed always to permeate his frame certainly appeared to have been the immediate cause of his breaking down some few years ago. This was one more warning of the effect of very great mental efforts on the brain. Many knew that the deceased professor had suffered from extreme insomnia, so much so that the physicians had vainly tried almost all known means of inducing sleep. Therefore it was no wonder that he found it necessary every time he was suffering from any little pain to take chloral or some other sedative. The exact particulars of his death had not yet been ascertained, but no doubt the effect of what was an ordinary dose of chloral for a man, in his position had proved too great for his comparatively weakened brain. He moved—

> "That this Council learns with profound regret of the death of Professor Tyndall, whose labours in the domain of physics during his long and brilliant career has stimulated in a high degree the progress of every branch of scientific knowledge. The Council recalls with pride Professor Tyndall's connection with the Pharmaceutical Society as an honorary member for more than fourteen years, and desires to pay this tribute to his memory."

The **VICE-PRESIDENT** seconded the motion, which was put and carried unanimously.

### THE LATE MR. R. H. DAVIES.

The **PRESIDENT** next announced that since the last meeting the Society had sustained a severe loss by the death of Mr. R. H. Davies, a member of the Board of Examiners for England and Wales. This gentleman had been ill for some months, and unable to take part in the meetings of the Board and the duties attached thereto, but it had been hoped that with a long leave of absence his health might be restored, but it had been decreed otherwise. Mr. Davies, who was a Bell scholar, was at one time a pupil of the late Mr. George Edwards, a gentleman who took great interest in all educational matters and the training of his apprentices. Mr. Davies some years ago was appointed Demonstrator in the Laboratory, but after a time he thought he should like to devote himself to analytical work, and accordingly he became a public analyst, and was afterwards appointed superintendent of the Apothecaries' Company. Mr. Davies performed his work in an extremely conscientious manner, and was always extremely popular with the candidates. He begged to move—

> "That this Council deeply regrets the early death of Robert H. Davies, a member of the London Board of Examiners since 1889, and desires to express its sympathy with Mrs. Davies in her heavy bereavement."

Mr. **HAMPSON**, in seconding the motion, regretted that Mr. Davies should have passed away when such a brilliant future appeared to be before him.

The resolution was passed unanimously.

### THE LATE MR. PEDLER AND MR. G. BAGGETT FRANCIS.

The **PRESIDENT** then said that within the last few days the Society had lost two gentlemen who had taken considerable interest in pharmaceutical affairs, the first being Mr. Pedler, who was one of the founders of the Pharmaceutical Society in 1841. Some of the younger generation did not remember the pharmacy that existed in Fleet Street, immediately opposite the Temple. In that pharmacy there was a nice-looking grey-headed man, who was constantly to be seen at work, and had obtained for himself a considerable business and the greatest possible confidence amongst the leading members of the legal profession. Mr. Pedler's name as a pharmacist was probably better known to the older judges of the present day than that of any living pharmacist. He took considerable interest in the work of the Society, and between 1860 and 1868 attended all the meetings. His son, whom he sent to the Society's school, obtained nearly all the honours in his time, and was now Professor of Chemistry at the University of Calcutta. Another son was in considerable practice as a medical man at Knightsbridge. Mr. Pedler died at the ripe age of eighty, and was an excellent example of what a straightforward honest man could do. The next person whose loss they had to regret was Mr. George Baggett Francis, one of the associates of Jacob Bell, and a friend of Mr. Thos. Hyde Hills. He should not be telling any secret or saying anything which was not complimentary to the memory of Mr. Francis in stating that Mr. Jacob Bell left him a legacy in consideration of his extreme regard for him. He was also associated with Mr. Valentine Wright (Wright, Francis and Co.), and, on this connection ceasing after a time, he joined the firm of Hearon, Squire, and Co., of Coleman Street, and was in fact the last surviving member of that old firm. At the time he commenced business in the wholesale trade he was regarded as a typical pharmacist, and he did more to gain the confidence of pharmacists in wholesale houses than almost any man of his day. He was an extremely conscientious man, and had raised the standard of the preparations which wholesale houses must supply, to a very high pitch, and he deserved well of all pharmacists for that. He begged to suggest that in both cases a letter be sent from the Council expressing its deep regret at the loss which pharmacists in general had sustained.

Mr. HILLS supported the suggestion, which was unanimously agreed to.

### BOARDS OF EXAMINERS.

The following were appointed on the Board of Examiners for England and Wales:—

*Board of Examiners for England and Wales.*

Corder, Octavius, 31, London Street, Norwich.
Druce, George Claridge, 118, High Street, Oxford.
Fletcher, John, 12, Montpelier Avenue, Cheltenham.
Gerrard, Alfred William, Guildford Street, Chertsey.
Greenish, Thomas Edward, 30, Conduit Street, W.
Holmes, Walter Murton, 7, Belgrave Mansions, Grosvenor Gardens, S.W.
Ransom, Francis, 12, Bancroft, Hitchin.
Saul, John Edward, 143, New Bond Street, W.
Symons, Wm. Henry, 130, Fellowes Road, N.W.
Tanner, Alfred Edward, 2, Bruce Grove, Tottenham.
Taylor, George Spratt, 13, Queen's Terrace, St. John's Wood, N.W.
White, Edmund, St. Thomas's Hospital, S.E.

The following were appointed to act on the Board of Examiners for Scotland:—

*Board of Examiners for Scotland.*

Boa, Peter, 119, George Street, Edinburgh.
Dott, David Brown, 104, South Canongate, Edinburgh.
Fraser, Jonathan Innes, 9, Dundas Street, Edinburgh.
Gibson, Adam, Thistle Street Lane East, Edinburgh.
Jack, James, 102, High Street, Arbroath.
Maben, Thomas, 5, Oliver Place, Hawick.
Nesbit, John, 162, High Street, Portobello.
Sutherland, John William, 68, High Street, Dumfries.

### ADDITION TO THE REGISTER.

The REGISTRAR reported that—

John Pope, 61, Broad Street, Blaenavon,

having made a declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported, his name had been placed on the Register.

### RESTORATION TO THE REGISTER.

The following person, who has made the required declaration and paid a fine of one guinea, was restored to the Register of Chemists and Druggists:—

Joseph Crookes, 48, Stanley Road, Liverpool.

### LOCAL SECRETARIES.

It was unanimously resolved that the following gentlemen be appointed Local Secretaries in their respective districts:—

| | |
|---|---|
| Southport | James Righton. |
| Montrose | Alex. Davidson. |
| Keith | James Pirie. |
| Coldstream | Wm. M. Elliot. |
| Carshalton | Francis Carter. |
| Ayr | Adam McGregor. |
| Rochdale | Edward R. Cross. |

### ASSISTANT SECRETARIES.

The PRESIDENT said the following gentlemen had been nominated as Assistant Secretaries in Dundee and Glasgow:—

| | |
|---|---|
| Charles Kerr | Lochee. |
| William Park | Broughty Ferry. |
| James Moir | South Glasgow. |
| Wm. L. Currie | West Glasgow. |
| Walter Paris | Central Glasgow. |

Mr. SCHACHT moved that they be appointed Assistant Local Secretaries for their respective districts. The motion was seconded by Mr. Allen, and unanimously adopted.

### DIVISIONAL SECRETARIES FOR EDINBURGH.

The following were appointed Divisional Secretaries in Edinburgh:—

| | |
|---|---|
| James Paton | South Edinburgh. |
| George L. McGibbon | West Edinburgh. |
| Claude F. Henry | East Edinburgh. |
| John A. Forret | Central Edinburgh. |

### SUPERINTENDENTS AND DEPUTY-SUPERINTENDENTS.

On the motion of the PRESIDENT, seconded by Mr. HAMPSON, the following were appointed to act as Superintendents and Deputy-Superintendents of written examinations for the ensuing year:—

*Superintendents.*

| | |
|---|---|
| Aberdeen | Strachan, Alexander. |
| Aberystwith | Wynne, Edward Price. |
| Birmingham | Thompson, Charles. |
| Brighton | Gwatkin, James Ross. |
| Bristol | Stroud, John. |
| Cambridge | Deck, Arthur. |
| Canterbury | Bing, Edwin. |
| Cardiff | Munday, John. |
| Carlisle | Hallaway, John. |
| Carmarthen | Lloyd, Walter. |
| Carnarvon | Jones, John. |
| Cheltenham | Barron, William. |
| Darlington | Robinson, James. |
| Douglas, Isle of Man | Radcliffe, John C. |
| Dundee | Hardie, James. |
| Edinburgh | Stephenson, John Bertram. |
| Exeter | Lake, John Hinton. |
| Glasgow | Kinninmont, Alexander. |
| Guernsey | Nickolls, John Bate. |
| Hull | Bell, Charles Bains. |
| Inverness | Bethune, William J. |
| Jersey | Cole, George. |
| Kirkwall (Orkney) | Stewart, Duncan. |
| Lancaster | Vince, James. |
| Leeds | Reynolds, Richard. |
| Lincoln | Birkbeck, John Thomas. |
| Liverpool | Parkinson, Richard. |
| London | Taylor, George Spratt. |
| Manchester | Kemp, Harry. |
| Newcastle-on-Tyne | Proctor, Barnard S. |
| Northampton | Bingley, John. |
| Norwich | Sutton, Francis. |
| Nottingham | Parker, William Henry. |
| Oxford | Prior, George Thomas. |
| Penzance | Shakerley, Benjamin. |
| Peterborough | Heanley, Marshall. |
| Plymouth | Hunt, Freeman W. |
| Sheffield | Ward, William. |
| Shrewsbury | Cross, William Gowen. |
| Southampton | Dawson, Oliver Robert. |
| Worcester | George, Henry. |
| York | Sowray, Joseph. |

*Deputy-Superintendents.*

| | |
|---|---|
| Aberdeen | Clark, James. |
| Aberystwith | Ellis, Robert. |
| Birmingham | Perry, George Edward. |
| Brighton | Savage, William Wallace. |
| Bristol | Pitman, John. |
| Cambridge | King, George. |
| Canterbury | Amos, Daniel. |
| Cardiff | Coleman, Alfred. |
| Carlisle | Pattinson, Michael Herd. |
| Carmarthen | Richards, Jonah Palmer. |
| Carnarvon | Jones, David. |
| Cheltenham | Palmer, Frank Thomas. |
| Darlington | Hutchinson, Rev. E. |
| Douglas, Isle of Man | Young, John. |
| Dundee | Hardie, James Miller. |
| Edinburgh | Ewing, James Laidlaw. |
| Exeter | Harris, Henry William. |
| Glasgow | Davison, Thomas. |
| Guernsey | Carré, James Hilary. |
| Hull | Stoakes, Benjamin M. |
| Inverness | McRitchie, David. |
| Jersey | Baker, John Thomas. |
| Kirkwall (Orkney) | Webster, Rev. David. |
| Lancaster | Arkle, William. |
| Leeds | Branson, Fredk. Woodward. |
| Lincoln | Houfe, Robert William. |
| Liverpool | Hocken, Joshua. |
| London | Allen, Charles Bowen.<br>Moon, Harry. |
| Manchester, etc. | Swinn, Charles. |
| Newcastle-on-Tyne | Clague, T. Maltby. |
| Northampton | Mayger, William David. |
| Norwich | Corder, Octavius. |
| Nottingham | Gill, William. |
| Oxford | Thurland, Henry. |
| Penzance | Symons, Netherton H. |
| Peterborough | Saunders, James Edwin. |
| Plymouth | Woods, William Herbert. |
| Sheffield | Morrison, Charles Orr. |
| Shrewsbury | Blunt, Thomas Porter. |
| Southampton | Spearing, James. |
| Worcester | Virgo, Charles. |
| York | Kendall, Edward Basnipp. |

A resolution was also carried to the effect that the supervision of the Major written examinations should, in future, devolve upon the Superintendents of written examinations in London and Edinburgh or their deputies.

### VOTES OF THANKS.

On the motion of the PRESIDENT, a vote of thanks was accorded to the Examiners in England and Scotland for their services during the past year.

The PRESIDENT announced that Messrs. Stephenson and Kinninmont had retired from the Board, of which they had been members for some considerable time. He therefore begged to propose—

> "That the Council desires to record its sense of the services rendered to the Society by Mr. J. B. Stephenson and Mr. A. Kinninmont during the many years they have been members of the Society's Board of Examiners in Scotland. The best wishes of the Council follow them in their retirement."

He was sure that this would be adopted with unanimity. In their respective spheres both the gentlemen were distinguished in pharmacy, though their views were somewhat different. Each of them had characteristics which he thought might fittingly be described as marking them out as distinguished men.

Mr. JOHNSTON seconded the motion, which was carried unanimously.

### REPORT OF THE FINANCE COMMITTEE.

This report was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. With regard to the receipts, he said there was nothing very special to call attention to. They had received a certain number of examination fees, which were coming in pretty well now. On the General Fund account there was very little to mention with regard to the payments. The salaries of the officers were paid monthly, and this time they received two months, which cleared them up to the end of the year. On the Benevolent Fund account a number of subscriptions had lately been received, and he hoped that it would not shock his friend, Mr. Hampson, to learn that this had been brought about by a desire on the part of certain persons to help candidates to obtain annuities. Deducting the grants made during the past month, there was a balance of £569 in hand, which was barely sufficient to pay the amount of the annuities in January. He mentioned this fact for the benefit of those who might think that they had a large balance in hand. On the Donation account they had received half of the legacy bequeathed by the late Mr. Barker, and they had also received a donation from the Chemists' Aerated Mineral Water Association, of which their friend Mr. Horace Davenport was Chairman. This company had had a prosperous half year, and as the shares were held by chemists and druggists —their business being exclusively with chemists and druggists—they were anxious to give some donation to the Benevolent Fund. Being met with a technical objection to their voting money which they were not empowered to do under their articles, the shareholders had voted a sum of fifty pounds to the directors to do what they thought proper with, and the directors, through their chairman, had handed over this amount to the Fund. He felt sure that this generosity would be justly appreciated. As to the Orphan Fund, they had received no subscriptions, and there was nothing special to which he need refer.

The resolution was unanimously agreed to.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£5 to the widow (aged 64) of a member who has had eight previous grants. (London).

£10 to a registered chemist and druggist (aged 60) who failed in business, and has now no means of support. (Halifax).

£5 to a registered chemist and druggist (aged 66) whose case had been before the Committee at its last meeting. (Wolverhampton).

Three cases had not been entertained.

The SECRETARY had reported four cases of annuitants who had recently received legacies. The Committee had recommended the reduction to £35 of the annuity paid to one of the annuitants. Two other cases had been deferred, and in one case no reduction had been made. The SECRETARY had been requested to draft a scheme to guide the Committee in dealing with future cases of annuitants who had received legacies.

The VICE-PRESIDENT (as Chairman of the Committee), in moving the adoption of the report, said no doubt the new departure as regards the annuitants would give rise to a certain amount of feeling, but he thought the course which had been taken was just, as well as generous. However much they might regret having to reduce the amount paid to any annuitant, it had become inevitable when they took into consideration the increased amount of each annuity, and remembered that they were unable to make grants to all their distressed brethren owing to the lack of funds. They had twice as many candidates to vote for this time as it was possible to elect, and there were other applicants almost, if not quite, as deserving to be placed on the list as those already upon it. When they could arrange to pay their distressed brethren ample annuities to enable them to pass the remainder of their days in comfort they would be glad to do so, but it was also their duty to do the greatest amount of good to the largest number with the funds at their disposal. The Committee had practically agreed upon the principle of a rule upon which they would act in future. The details of this rule were not before them to-day, but would be presented at the February meeting.

Mr. **Bottle**, in seconding the motion, said the Vice-President had left him nothing to do except endorse what he had said. As to the purchase of votes for securing the election of candidates, it was within his knowledge that much good had come out of this practice, for in his own neighbourhood he recollected some twenty years ago that gentlemen outside the trade who were desirous of assisting a certain candidate had subscribed to the Fund, and many of them went on for years doing this, and one had been a continual subscriber ever since.

Mr. **Hampson** said he quite agreed with the principle adopted in the carrying out of the new rules. As to the question of buying votes, that was a subject which he would rather not discuss at the present time.

The report was unanimously adopted.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| October . | Day . . | 505 | 27 | 9 | 19 |
| | Evening . | 199 | 14 | 4 | 9 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| October . . . | 217 | 137 | 80 | £1 3*s*. 7½*d*. |

Donations to the Library had been announced (*Pharm. Journ.*, November 11, p. 393), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the undermentioned works be purchased:—

*For the Library in London*—

Tschirch and Oesterle, Anatomischer Atlas der Pharmakognosie und Nahrungsmittelkunde.

*For the Library in Edinburgh*—

Ince, Latin Grammar of Pharmacy, latest edition.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| October . | Day . . | 432 | 38 | 6 | 17 |
| | Evening | 36 | 8 | 1 | 1 |

Donations to the Museum had been announced (*Pharm. Journ.*, Nov. 11, p. 393), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The staff of the school had attended and reported on the various classes.

The Committee had granted an application from the Chemists' Assistants' Association for the loan of microscopes and accessories for use at the Conversazione of the Association.

The **President** moved the adoption of the report, and referred to the fact that they had just received two copies of a book from the Secretary of State for India, for which their special thanks were due.

The report of the Committee was adopted.

### PRIZES TO STUDENTS.

Mr. **Leigh** then moved the following motion, which he said was brought before the Council some five years ago:—

> "That in order to encourage youths to study during their apprenticeship, a number of good prizes should be offered by the Pharmaceutical Society to be competed for annually by the registered apprentices of the Society, and that the Library, Museum, Laboratory, and House Committee be requested to report on the best method of carrying out this proposal."

He said that at the time this motion was brought forward there was a curriculum scheme in the way, but that scheme had since been abandoned. There were nearly 1000 registered apprentices who contributed half-a-guinea every year, for which they received a copy of the Journal, but that was not of much use to them, as it contained scientific papers which they could not understand. He should like to see a page written by the teachers to the Pharmaceutical Society every week especially for students. If this plan were adopted he thought it would bring the students more in touch with the Society. In support of his proposition he quoted the remarks of Professor Clowes at the Nottingham Conference, which have already been reported *in extenso* in these columns.

The motion, not being seconded, fell to the ground.

### THE SOCIETY'S HOUSE IN EDINBURGH.

The **President** said he had received a report from Mr. Hill with regard to the new building in Edinburgh, from which it appeared that contracts had been entered into for the masonry, ironwork, plumbing, carpenters' work, etc., at a sum exceeding the architect's estimate by £100. The increase was entirely due to the fact that it had been decided to go deeper with the excavation. The estimate for the fittings would not be exceeded. He did not propose to pass any resolution on the subject, but thought it right to mention the receipt of the report.

### CODE OF ETHICS.

The **President** read the following letter which had been received from the Secretary of the Chemists' Assistants' Association:—

"Chemists' Assistants' Association,
"103, Great Russell Street, W.C.
"November 13, 1893.

"R. Bremridge, Esq.

"Dear Sir,—At a meeting of the above Association, held on Thursday, November 2, it was unanimously resolved that the following resolution be forwarded to the Council of the Pharmaceutical Society:—

"'This meeting is of opinion that the Pharmaceutical Society should form a code of ethics for pharmacists, and should have power to remove from the Register the names of persons guilty of breaches of this code.'

I am, Sir,
"Yours faithfully,
(Signed) "C. Edward Sage,
"Hon. Sec."

He thought the Council would probably appreciate the feelings of their younger brethren on this matter, and he hoped that in their time they would be able to establish a code of ethics. But at the present time, and under existing circumstances, the subject was a somewhat difficult one. The latter part of the resolution dealt with the removal of persons from the Register for breach of the code, but until the Council had power to do as requested, they could not satisfactorily approach the subject. Nevertheless, he thought it was open to all educated men, especially young men, to adopt for themselves a certain code of ethics which would do good for the next generation. If that principle was worked out spontaneously it would be much better than the Council formulating any plan. This was his own feeling in the matter, but if the Council thought the question should be referred to the Library Committee, he should not raise the slightest objection.

Mr. ATKINS suggested that the matter should be referred to the Committee. He considered it highly creditable to the young men that they had moved in this matter. He had often felt the desirability of removing from the Society men who were certainly not worthy to be connected with it.

The VICE-PRESIDENT thought the discussion of this subject would do a great deal of good to chemists and druggists. He was very pleased to read the discussion which the paper had evoked, and felt vexed that distance alone prevented him from being present to take part in it. He felt proud of the Association for undertaking such a matter. He feared that the Council could not do anything practical by talking the matter over, and would therefore propose that it be referred to the Library Committee.

The proposition having been seconded, was carried unanimously.

### THE SALE OF CARBOLIC ACID.

The following communication from the Local Government Board was then read:—

"Local Government Board,
"Whitehall, S.W.
"December 1, 1893.

"Sir,—I am directed by the Local Government Board to forward, for the information of the Pharmaceutical Society, the enclosed copy of a question addressed by Mr. Macdona to the President of the Board, in the House of Commons, on the 24th ultimo, with reference to the sale of carbolic acid, together with a copy of Sir Walter Foster's reply to the same.

"I am, Sir,
"Your odedient servant,
(Signed) "ALFRED D. ADRIAN,
"Assistant Secretary."

"R. Bremridge, Esq.,
"Secretary to the Pharmaceutical Society
of Great Britain."

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[*Copy of enclosure referred to above*].
Friday, November 24, 1893.

Mr. Macdona,—To ask the President of the Local Government Board if he is aware that since February, 1892, to November, 1893, there have been 230 deaths due to the taking of carbolic acid, 174 of which were suicidal and 56 accidental.

Whether, in view of this alarming increase of suicides from the fact of carbolic acid being sold in retail so cheaply, the Government will place carbolic acid under the Pharmacy Act, and only allow it to be sold by chemists in such small quantities as in the case of arsenic and prussic acid, etc., so that there may be greater restrictions placed upon its sale in small quantities.

Whether, with a view of bringing public attention to bear upon this matter, he will instruct coroners in certifying the cause of suicides to certify the name of the poison which caused the suicidal or accidental death in each case.

And whether he will order a Return of the number of deaths caused by carbolic acid during the last five years to be placed upon the table of the House.

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[*Copy of Sir Walter Foster's reply*].

I have no information as to the number of deaths due to the taking of carbolic acid between February, 1892, and November, 1893, except that which the hon. member has been good enough to furnish. The Local Government Board had no jurisdiction with regard to the articles which are to be deemed poisons for the purpose of the Pharmacy Act, 1868. Additions to the articles specified in the Schedule may from time to time be made by resolution of the Pharmaceutical Society with the approval of the Privy Council, and the Board will bring the matter under the attention of that Society.

The Board has no jurisdiction with regard to coroners, and is not empowered to issue any such instructions as the hon. member suggests.

As regards the Return, I have been in communication with the Registrar-General, and I understand that the particulars cannot at present be furnished for a later period than 1891. If the hon. member moves for a Return for the five years, 1887 to 1891, it will be granted.

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The PRESIDENT said they were all aware that the Council had for a long time felt that carbolic acid was a very dangerous poison, and as such should be included in the schedule. The way in which this dangerous liquid was sold, in all sorts of vessels, and very often unlabelled, rendered it extremely difficult to trace cases of accidental poisoning, and the facility with which it could be obtained had made it a favourite poison for suicides. The Council had repeatedly taken action in the matter, and he thought the present was an appropriate time to pass a formal resolution that carbolic acid should be added to the schedule of poisons. He begged to move—

> "That by virtue, and in exercise, of the powers vested in the Council of the Pharmaceutical Society of Great Britain, the said Council do hereby resolve and declare that carbolic acid ought to be deemed a poison within the meaning of the Pharmacy Act, 1868, and ought to be deemed a poison in the second part of the schedule to the said Pharmacy Act, 1868."

It had been urged that if restrictions were placed upon the sale, it would be difficult to obtain carbolic acid in times of sickness, but this was certainly not the case, for in the case of epidemics disinfectants were provided in large quantities by the local authorities and delivered free. He remembered that on one occasion Dr. Thorne Thorne recommended a number of uses for corrosive sublimate, which was already in the schedule, pointing out how it was to be used and the means of obtaining it. The public would be protected, and no inconvenience occasioned, by placing carbolic acid in the schedule.

Mr. HAMPSON, in seconding the motion, said he hoped this matter would receive the favourable consideration of the Privy Council. It seemed to him to be a scandal that carbolic acid had not been long ago placed in the schedule, for if this had been done a number of valuable lives might have been saved. It was scandalous that a child should be able to go to a shop and obtain the poison without any precautions at all being taken. Now that there appeared to be a different feeling upon the question he hoped there would be no difficulty in getting it placed in the schedule. In the case of fever or epidemic, and carbolic acid being required, it was distributed free at certain places under certain restrictions, and putting it in the schedule would not place any obstacle in the way of obtaining it for such purposes.

Mr. HARRISON was glad that their attention had been drawn to the matter in a formal way, as there was now some hope that their recommendation to the Privy Council would receive more attention than it had hitherto done. He should like the resolution to be prefaced with some words to the effect that the attention of the Council had been called by the Local Government Board to the frequency with which carbolic acid was associated with suicides. On one occasion, when approaching the Privy Council they had been told that they did recognise the fact that accidents were frequently caused by the free sale of carbolic acid, still the advantages of its free sale counterbalanced the disadvantages. He should like to press on the Privy Council the fact that another department of the Government, and one specially charged with the public health of the country, had called the attention of the Society to the fact that some restriction should be placed upon the sale of this article. If there was any continuity of feeling between the different departments a recommendation of that kind, backed up by the opinion of the Council and the common sense of the public, ought certainly to be successful.

The **President** suggested that the resolution should stand as drawn, and that the preface should be embodied in a letter accompanying the resolution.

Mr. **Hills** suggested that, without going into any debatable matter, a historical *résumé* of the case should be submitted to the Privy Council.

Mr. **Allen** regarded the resolution as a step in the right direction. It was most vital to the performance of the duty entrusted to the Council that they should press the Privy Council for the inclusion of carbolic acid in the schedule of poisons, in the interest and for the safety of the public. He hardly thought that those who had the responsibility of throwing this back upon former occasions had the slightest idea of the frequency of deaths and accidents from this terribly poisonous substance. It was appalling in the ordinary practice of pharmacy, especially in small country towns, to see the frequency with which children of tender years came in with a cup or gallipot for a pennyworth or two pennyworth of carbolic acid. Of course the pharmacist naturally said he would not serve it in such a vessel, but only in a poison bottle, whereupon the child went back and said what it had been told, with the result that the pharmacist was looked upon as an antiquated individual, and the supply was obtained from the nearest oilshop. He did not believe that any restrictions on the sale would in the slightest degree interfere with the work done by the proper authorities in the distribution of disinfectants. The disinfectant was not used in its strong crude form as sold by oilshops and chemists, but was used in a diluted form. A committee of pharmacists could advise the Government if necessary as to a way in which carbolic acid could be distributed which would in no way interfere with its utility as a disinfectant.

Mr. **Atkins** said he should be glad if the resolution could be backed up by the personal influence of the President. He recollected that some years ago the Council sent a deputation to the Lord President upon the subject, but since then a great change had come over the public mind as to the use of poisons. A question was then put as to whether there had been any large amount of poisoning by this article, but at that time the number of deaths could not be given. It now appeared from figures which had been given that the number of deaths was really startling. A recommendation coming from a society which by law was empowered to recommend what articles should be included in the schedule ought to receive the strongest possible consideration.

Mr. **Richardson** had very great pleasure in supporting the proposition. He thought they ought to express their gratitude to the member of Parliament who drew attention to the question. He considered they should approach the Privy Council, and not be satisfied with that, but continually go on pegging away until they obtained the concession.

Mr. **Abraham** thought the suggestion made by Mr. Harrison, as to pointing out to one department of the Government that another department had suggested the inclusion of this article in the schedule, was a very strong point in favour of its adoption.

Mr. **Schacht** hoped the resolution would be accompanied by a letter in the terms stated.

Mr. **Bottle** pointed out that it was the duty of the Council, under the section of the Act, to call the attention of the Privy Council to the matter, and that a letter was entirely unnecessary.

Mr. **Schacht** did not deny that it was their duty to do so, but he thought it much better that a copy of the foregoing resolution should be sent to the Privy Council with a suitable letter from the President.

It was unanimously agreed that this course should be adopted, and the resolution was carried unanimously.

### THE BRITISH PHARMACOPŒIA.

The following letter was then read :—

"17, Bloomsbury Square, London.
"Dec. 5, 1893.

"*To the Council of the Pharmaceutical Society of Great Britain.*

"Mr. President and Gentlemen,—As reporter on the Pharmacopœia to the Medical Council I have received the permission of the President of that body to lay before you the accompanying documents relating to a subject on which you will in due time be approached officially by the Medical Council, namely, the issue of another edition of the British Pharmacopœia.

"That issue will have three prominent features of interest for you.

"First, a greatly extended or, in one word, imperial character will be given to the edition. This will be accomplished chiefly by the aid of the medical and pharmaceutical authorities of India and the Colonies, acting at the suggestion of the India Office, the Colonial Office, and, primarily, the Privy Council.

"Secondly, as you were requested in 1889 to aid in the production of an Addendum, so will your help be asked in the compilation of the British Pharmacopœia in its new and extended form.

"Thirdly, respecting the manner in which that assistance will be sought. As soon as the communications of the Indian and Colonial medical and pharmaceutical authorities are received, say one to two years hence, the Pharmaceutical Society of Great Britain will be invited, by the Medical Council itself, to participate in the production of the official volume. The medical part of the work will be done by the Pharmacopœia Committee appointed by the Medical Council, the pharmaceutical portion by the Pharmacopœia Committee appointed by the Pharmaceutical Council, the actual publication resting with the Medical Council pursuant to the Acts of 1858 and 1862.

"I may add that the great honour has been paid me of being asked to be Editor of this important edition of the British Pharmacopœia; and, with the concurrence of your President, I have accepted the position.

"I am, Mr. President and Gentlemen,
"Your obedient Servant,
(Signed) "John Attfield."

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Extract from the Address of the President, Sir Richard Quain, Bart., at the opening of the fifty-fifth session of the General Medical Council, November 28, 1893.

"Another matter of importance which I have to report has relation to the Pharmacopœia. The Council will remember that during the session of May, 1892, a communication was received from the Secretary of State for India on the subject of reports received from the medical authorities in India, pointing out certain inconveniences which resulted from their being required, according to the British Pharmacopœia, to use certain drugs which could be substituted by others of an equivalent value indigenous to India without incurring the expense of importation. Certain other matters of importance and interest were likewise indicated. The Council directed that the Secretary of State for India should be informed that the subjects contained in this communication should be fully considered.

"At the meeting of the Council in May, 1893, the Pharmacopœia Committee was authorised to enter into correspondence, through the Privy Council, with the India Office and the Colonial Office, with a view of ascertaining in what degree, if any, the British Pharmacopœia could be better fitted than at present to meet Indian and Colonial requirements as regards important natural drugs and pharmaceutical preparations.

"The communications, both to the India Office and to the Colonial Office, will be found printed in the programme of the present meeting. A sufficient supply of copies of these communications has been transmitted, through the Privy Council Office to the India Office and the Colonial Office, for the use of the medical and pharmaceutical authorities in India and the Colonies.

"It may be fairly anticipated that valuable and practical information available for the next edition of the Pharmacopœia will be thus obtained from the Indian and Colonial medical authorities, and that the Pharmacopœia, whilst still retaining by Act of Parliament its distinctive title of the British Pharmacopœia, may be made to assume something more of an imperial or national character.

"I cannot conclude this subject without expressing my sense of the obligation which the Council owes to the Privy Council Office for the attention given to this matter, especially by Sir Charles Lennox Peel, who is so fully informed on, and takes so great an interest in, all matters connected with the Medical Council."

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At the same meeting it was resolved, "That the following letters in regard to the British Pharmacopœia, submitted by direction of the President, and arising out of a communication from the India Office, reported on to the Council by the Pharmacopœia Committee on May 28, 1892 (Minutes, vol. xxix., p. 77), be received and entered in the minutes:—

[Letter No. 1.]

"General Council of Medical Education and Regis-
"tration of the United Kingdom,
"299, Oxford Street, London, W.
"October 17, 1893.

"To the Lord President of Her Majesty's
"Privy Council.

"My Lord,—1. In accordance with the instructions of the General Medical Council, as President of that body I have to ask the attention of your lordship to a communication from the India Office, addressed to the Medical Council by the Secretary of State for India, and dated December 12, 1891 (No. 194 Military, of October 14, 1891). Accompanying this communication were official reports from medical authorities in India respecting the operation of the current British Pharmacopœia on the practice of medicine and of pharmacy in that part of the British Empire.

"2. The reports alluded to show that certain of the drugs described in the British Pharmacopœia could, in relation to the Indian Empire, be usefully substituted by drugs indigenous to India, and that certain medicinal compounds employed there could be advantageously prepared by altered and amended formulæ. The writers further suggest that this subject should be referred to the Medical Council, who, as your lordship is aware, alone have legal authority, under the Medical Act of 1858, 'to alter, amend, and republish the Pharmacopœia' as often as they shall deem it necessary.

"3. I am directed, therefore, to inform your lordship that the current edition of the British Pharmacopœia was published eight years ago, and that as the preparation of any future edition of the Pharmacopœia must necessarily be the work of some two years at least, the Medical Council do not consider the present time to be too early a period at which to commence the consideration of such important matters as those referred to that Council by the Secretary of State for India in Council.

"4. I am also directed by the Medical Council respectfully to ask your lordship to submit to the Secretary of State for India this present communication, and to say that if the medical and pharmaceutical authorities resident in India will bring before the Medical Council such a list of suggestions relating to any part of the British Pharmacopœia as their knowledge of the pharmacology and pharmacy of India may enable them to make, those suggestions shall receive the fullest and best consideration of the Medical Council. Each suggestion should be as detailed as possible, and each list of suggestions as complete as possible.

"5. This subject being of interest and importance to other parts of the empire, the Medical Council think that it should be further brought under the consideration of your lordship, who, as President of Her Majesty's Privy Council, takes cognisance of the proceedings of the General Medical Council, with a view to direct thereto the attention of the several colonial authorities.

"I have the honour to be, my Lord,
"Your Lordship's obedient Servant,
"RICHARD QUAIN, M.D.,
"President."

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[Letter No. 2.]

"General Council of Medical Education and Regis-
"tration of the United Kingdom,
"299, Oxford Street, London, W.,
"October 17, 1893.

"To the Lord President of Her Majesty's
"Privy Council.

"My Lord,—1. The attention of the Medical Council having been directed by the medical authorities in India, through the Secretary of State for India, to the operation of the British Pharmacopœia in that part of the British Empire, and to modes in which the usefulness in India of future editions of that work may be extended, I have had the honour of submitting to your lordship a communication on the subject.

"2. It has occurred, however, to the Medical Council that the observations which have been made by the medical authorities in India apply to similar conditions, medical and pharmaceutical, existing in our colonies.

"3. The Medical Council, therefore, instruct me respectfully to ask your lordship, if such a course meets with your lordship's approval, to submit to the respective colonial medical and pharmaceutical authorities, through the Colonial Office, copies of these our two communications to your lordship, and to further ask your lordship to invite the co-operation of those colonial authorities, so far as they may think fit, in a like direction to that described in my communication relating to India.

"I have the honour to be, my Lord,
"Your Lordship's obedient Servant,
"RICHARD QUAIN, M.D.,
"President."

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At the meeting on December 4, the following report, by the Pharmacopœia Committee, was received and adopted:—

"The Committee report to the Council that since the last meeting a further reprint of 3000 copies of the British Pharmacopœia of 1885 has been issued, making the total number of copies of this edition issued up to the present date 41,000, the total number of copies of the Additions to the British Pharmacopœia being 13,125; and that, of the last reprint of 3000 copies of the British Pharmacopœia, 481 have been sold.

"The Committee now submit to the Council the following report:—

"In accordance with the instructions of the Council at the meeting in May last, the Pharmacopœia Committee have corresponded through the Privy Council with the India Office and the Colonial Office, with the object of ascertaining what changes, if any, could be effected in order to better fit the next edition of the British Pharmacopœia to the requirements of India and the colonies. The result has been that a very large number of copies of letters from the Chairman of the Committee to the Lord President of the Privy Council, as printed in the minutes of the Council, have been distributed by the India Office and the Colonial Office for use by the medical and pharmaceutical authorities in India and the colonies.

"The development of this action will require much care and consideration on the part of the Indian and colonial authorities as well as by the Committee, and will demand more time than that hitherto necessary for the preparation of a new edition of the Pharmacopœia. Nevertheless, this action must be regarded as the first step, however distant it may be, towards the issue of the next edition of the British Pharmacopœia.

"The Committee therefore recommend that the Council should now direct the preparation of another edition of the work, and, further, that the aid of the several medical authorities and of the Pharmaceutical Society be again invited, by the Council.

"The Committee also recommend that Professor Attfield be invited to continue his services as reporter and editor. He has long been advocate of the principle of extending the operation of the Pharmacopœia.

"RICHARD QUAIN, M.D.,
"Chairman."

The PRESIDENT said the substance of the letter addressed to the Council by Professor Attfield was that the Pharmacopœia Committee of the Medical Council had definitely reported that it was time to consider the propriety of a new edition of the Pharmacopœia. The first step had been taken in ascertaining that Professor Attfield was willing to undertake the editorship of the volume; and, secondly, a communication had been received through the Privy Council from the colonies and India with regard to their views upon the subject. It appeared that the colonies were very anxious that some of their local medicines and drugs should be placed in the Pharmacopœia, and that certain formulæ should be altered or made alternative, so that the British Pharmacopœia would be practically a standard in all English speaking countries. If the new Pharmacopœia was to have this character, it would be a very much more important work, and the details in connection with its preparation would be much greater than formerly. In due time they would receive a communication from the Medical Council with regard to it, but meanwhile it was desirable that these communications should be placed upon the minutes. It was the history of pharmacopœia compilation, and they might congratulate themselves upon the fact that the President of the Medical Council, Sir Richard Quain, who was on the Pharmaceutical Committee, appreciated the work done by the Society. There had from time to time been little periods of friction, but he was happy to say that all this had now passed away, so that the future pharmacopœias would be compiled under such conditions as to make them thoroughly representative. It was in some sense a great advantage that one of their staff had been asked to edit the volume, and the choice could not have fallen upon a more able man than Professor Attfield. He could only express his satisfaction that this phase of pharmacopœia compilation, thanks to the exertions of several persons, was now assuming a form which would be a benefit to the community and satisfactory to the members of the pharmaceutical body.

Mr. MARTIN thought it would be of great value to extend the Pharmacopœia to the colonies and India. There having recently been considerable discussion in the pharmaceutical journals in Canada as to whether the British or United States Pharmacopœia should be used, this news would be received with considerable satisfaction, and would settle the question probably for all time.

### FIRST EXAMINATIONS.

The following return was submitted to the Council:—

*List of Centres and Table of Attendances of Candidates at each Centre.*

| | 1891. Jan., Apr., July, Oct. | 1892 Jan. Apr., July, Oct. | 1893. Jan., Apr., July, Oct. | Total number of attendances at each centre at 12 examinations. |
|---|---|---|---|---|
| ENGLAND AND WALES. | | | | |
| Aberystwith | 4 | 6 | 4 | 14 |
| Birmingham | 78 | 58 | 80 | 216 |
| Brighton | 13 | 18 | 4 | 35 |
| Bristol | 37 | 27 | 37 | 101 |
| Cambridge | 17 | 24 | 13 | 54 |
| Canterbury | 10 | 10 | 13 | 33 |
| Cardiff | 37 | 24 | 38 | 99 |
| Carlisle | 26 | 32 | 48 | 106 |
| Carmarthen | 32 | 30 | 32 | 94 |
| Carnarvon | 22 | 18 | 27 | 67 |
| Cheltenham | 9 | 5 | 12 | 26 |
| Darlington | 27 | 17 | 31 | 75 |
| Exeter | 22 | 26 | 21 | 69 |
| Hull | 25 | 26 | 16 | 67 |
| Lancaster | 16 | 18 | 28 | 62 |
| Leeds | 74 | 64 | 68 | 206 |
| Lincoln | 28 | 34 | 42 | 104 |
| Liverpool | 65 | 55 | 71 | 191 |
| London | 173 | 144 | 165 | 482 |
| Manchester | 112 | 119 | 123 | 354 |
| Newcastle | 41 | 39 | 31 | 111 |
| Northampton | 8 | 14 | 14 | 36 |
| Norwich | 28 | 23 | 20 | 71 |
| Nottingham | 57 | 49 | 45 | 151 |
| Oxford | 18 | 13 | 14 | 45 |
| Penzance | 13 | 10 | 5 | 28 |
| Peterborough | 25 | 25 | 15 | 65 |
| Plymouth | 12 | 14 | 20 | 46 |
| Sheffield | 36 | 29 | 34 | 99 |
| Shrewsbury | 15 | 16 | 19 | 50 |
| Southampton | 37 | 38 | 32 | 107 |
| Worcester | 6 | 3 | 8 | 17 |
| York | 25 | 27 | 23 | 75 |
| SCOTLAND. | | | | |
| Aberdeen | 68 | 63 | 70 | 201 |
| Dundee | 47 | 61 | 45 | 153 |
| Edinburgh | 79 | 96 | 110 | 285 |
| Glasgow | 85 | 77 | 92 | 254 |
| Inverness | 13 | 7 | 14 | 34 |

Douglas, I. of Man.

Total number of attendances at eight examinations .......... 14

Guernsey.
Total number of attendances at eight examinations ................................ 2
Jersey.
Total number of attendances at eight examinations ................................ 6
Kirkwall.
Total number of attendances at two examinations ................................ 2

### REPORT OF THE GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitor, stating the progress made with cases which had been placed in his hands. Several penalties had been recovered and several defendants had paid penalties without the cases going into court.

The report also contained a recommendation that the Committee be empowered to consider the method of conducting the examinations, and the conditions under which the Boards of Examiners are appointed, and to report what changes are desirable.

A large number of cases of infringement of the Pharmacy Act were considered, and it was recommended that the Registrar be authorised to take proceedings against the offending parties.

The Council went into committee, as usual, for the reading and consideration of the legal portion of the above report.

On resuming, the report and recommendations were unanimously adopted, and resolutions were passed authorising the Registrar to institute proceedings against certain persons named therein.

### CAPE OF GOOD HOPE PHARMACY BOARD.

The **PRESIDENT** reported that the Secretary of the Cape Pharmacy Board had forwarded, for the information of the Society, a copy of the first issue of the Medical and Pharmacy Register for the colony of the Cape of Good Hope. He would direct that a letter of thanks should be sent to their friends at the Cape for their courtesy in sending the Register.

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# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, November 30, the President, Mr. E. F. Harrison, took the chair. The evening was devoted to the reading and discussion of short papers by members, the first being

### A DISPENSING NOTE.

BY T. TICKLE.

The following mixture dispensed in the usual way deposited large crystals a few hours after preparation, in such a way as to render it impossible for the patient to take the contents in equal doses:—Ferri et quininæ citratis, ℈ii; potass. citratis, ʒii; acid citrici, ʒi; aquam ad ℥vi. The result of a few experiments showed that the crystals consisted of acid citrate of quinine, $C_{20}H_{24}N_2O_2,H_3C_6H_5O_7$; and that in about twenty-four hours practically the whole of the quinine was separated from the mixture in this form. It was suggested that the formation of large crystals indicated that the acid citrate of quinine was formed only gradually, whence it followed that the agent which turned it out had a tendency to form a double salt with the ferric citrate, not much greater than that of the quinine citrate. This might partly explain why precipitation between citrate of potassium and citrate of iron and quinine occurred only occasionally. But it was in some instances due to the presence of small quantities of other acids. In one instance no separation took place in the mixture; and this was found to be due to the presence of sulphuric acid, which had found its way into the mixture with the citrate of iron and quinine. The best way to dispense the mixture was to dissolve the ingredients in the smallest possible quantity of water and set aside for some time. When the separation of crystals seemed complete they should be rubbed to a fine powder, which could then be readily distributed in the bottle by shaking. This method, however, was not altogether satisfactory, for often the crystals continued to be formed, or the small crystals suspended aggregated together. If possible, the case should be notified to the prescriber, who might be able to materially alter the form of the prescription, or by permitting the addition of a small quantity of some such salt as ammonium chloride, enable the dispenser to send out the medicine clear and without liability to deposit.

In the discussion which followed, the President said the prescriber was evidently ignorant of the decomposition which took place, and it would be advisable in this case to point it out to him and ask his sanction to the use of a little ammonium chloride or sulphuric acid, which would obviate the difficulty.

The next communication was on—

### HYPOPHOSPHITES.

BY GEORGE ROE.

In this paper, the author dealt with the introduction of the hypophosphites into medicine, and also with the chemistry and pharmacy of the subject. He had found that the commercial salts contain an appreciable amount of phosphites, so that, on mixing solutions of calcium and sodium hypophosphites (20 grains of each in 1 ounce), double decomposition appears to take place, calcium phosphite, with any magnesium phosphite present, being precipitated, whilst sodium hypophosphite remains in solution.

The President said the precipitate, which evidently was phosphite of calcium, was caused, he thought, by oxidation during the process of manufacture, and this idea was borne out by the sodium salt being the more impure, for in this case the exposure of the salt during its preparation was considerable.

Mr. Dunning had once had a prescription ordering sod. hypophosph., in which case the doctor had told the patient that the mixture would be luminous. Had Mr. Roe ever heard of such a thing happening with mixtures containing hypophosphites?

Mr. Sage spoke of the difficulty experienced in producing absolutely pure salts of hypophosphorous acid, but he had never found the impurity very serious. He had found small traces of magnesium in the calcium salts, but phosphite he had only met with as an impurity occasionally. The sodium salt often contained traces of sulphate produced in the double decomposition of the calcium salt with sulphate of soda. Solution of hypophosphite of iron soon became reduced, with precipitation of phosphate or phosphite, and as this was the case it was only reasonable to suppose that other salts would be affected in a similar manner

Mr. Roe, in reply, stated that he had obtained his specimens from several sources, and was surprised at the results he had obtained.

The last paper was a

### DISPENSING QUERY.

BY C. EDWARD SAGE.

The author had frequently met with prescriptions ordering ung. boracis, and been doubtful whether it was the intention of the prescriber to order borax ointment or boric acid ointment. The question was partially solved when the order was written, ung. boracis, "softer than P.B.," or "stiffer than P.B.," and in such cases boric acid ointment was undoubtedly intended. When "ung. boracis" simply was ordered, it had been his practice to send borax ointment, but he would like to know what was the uniform practice.

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In the discussion which followed, it appeared that there was a diversity of opinion as to what should be dispensed in such a case.

Mr. Gane subsequently submitted the following prescriptions to the meeting, but neither of them was satisfactorily interpreted :—

℞ Lin. Tereb. Acet ........................℥iv.
Acid Acet. Fort. 40·100 .........aa. ʒiv.
M.

℞ Liq. Hyd. Perchlor. $\frac{1}{1000}$ per cent.

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## ROYAL MICROSCOPICAL SOCIETY.

At the meeting held on Wednesday, November 15, Mr. A. D. Michael, F.L.S. (President), took the chair.

Mr. C. L. Curties exhibited and described a microscope by Leitz, of Wetzlar, made on the English model, with tripod foot and inclining body, horse-shoe stage, and sub-stage fittings.

Mr. A. W. Bennett gave a *résumé* of Mr. W. West's paper on "New British Fresh-Water Algæ."

Professor F. Jeffrey Bell read a paper by Mr. G. Sandeman on a "Parasitic Disease in Flounders." The author stated that there are often found on the coast flounders having small round swellings under the skin, which have been described under the name of multiple tumours. The tumours have the appearance of eggs, deposited irregularly beneath the skin. They cause a slight projection of the skin, which sinks slightly between the individual ova, but, when very many are present in one mass, the large tumour which is formed projects considerably from the body, and is sometimes even a pedunculated or finger-shaped formation. On microscopic examination the contents of the tumours present all the characteristics of eggs. The cause and habits of the parasite are so obscure that the author finds it impossible to pronounce a definite opinion on the subject.

The President then announced that the Society's Conversazione would take place in the early spring, after which

Mr. C. Beck raised a discussion as to the possibility of obtaining a standard tube-length.

Dr. W. H. Dallinger congratulated Mr. Beck upon the able way in which he had brought the matter before them, and thought that a Committee should be appointed to discuss the whole question.

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# Provincial Transactions.

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, November 23, owing to the death of Mr. John Currie, brother to the President, the chair was occupied by Mr. Thomas Robinson, Vice-President. A vote of condolence was passed by the members, on the motion of Mr. James Robb, seconded by Mr. James Moir, and the Secretary instructed to send excerpt of minute to the relatives of the deceased, who had been an active worker in the late Chemists' and Druggists' Assistants' Association, and was much respected.

The following paper was then read—

### SIMPLE URINE ANALYSIS.

BY ARTHUR MCKELLAR.

Normal urine is a pale straw-coloured liquid, of a specific gravity about 1·020, slightly acid and free from any great amount of sediment. The constituents are various, phosphates, urates, peptones, and a host of smaller fry. It is principally tested for grape sugar and albumin.

Albuminous urine is generally lighter in gravity than normal, and presents rather a frothy appearance on shaking. The specific gravity of the perfectly cold liquid is taken by means of the urinometer, provided the patient has sent a sufficient quantity, a thing he or she often fails to do; indeed, one would imagine that it was an expensive article, from the small samples sometimes received. Should the density be below 1·015, albumin is pretty sure to be present. Filter and half fill a test tube with the clear liquid, and boil at the top only, so that the boiled portion above may appear in contrast with the unboiled portion below. If any haze appear drop in a little acetic acid, when, if the cloudiness be due to any phosphates or other salts, these will dissolve and leave nothing but the coagulated albumin. It is absolutely necessary to acidify, and through neglect of this precaution many mistakes happen.

Another easily applied test is to float the urine on nitric acid; if albuminous, an opaque hazy ring, more or less thick, forms at the junction of the two liquids, at the same time a darkish coloration appears, which may be disregarded, as it is taken to be an indication of the presence of biliary matter.

The best test of all is the saturated solution of picric acid (about 5 grs. to 1 oz.). This, added to the acidified liquid, produces a haze with albumin and peptones, the latter dissolving with heat. This is the most reliable test in use; a great many others have the one great fault, they are too sensitive.

Quantitatively, there is no ready method for determining albumin; it is customary to describe the amount present as "hazy," "milky," "curdy," in fact, just to give a relative idea.

With regard to the time when the urine ought to be collected, the sample should be taken after food and exercise, or, better still, from a mixture of all passed in the twenty-four hours. The erect position especially has an influence on the secretion of albumin, that taken on rising from bed being comparatively free compared with some taken later, say after breakfast.

Small quantities of albumin are found in even normal urines, and should be disregarded unless the haze is distinct.

We next come to sugar, and here the appearance has more of a lemonade brightness about it, while the gravity is higher than normal, 1·030 being common.

As a preliminary, boil with caustic potash and observe the amount of charring taking place with the sugar. This gives a rough idea as to quantity.

The best known quantitative, as well as qualitative, reagent is Fehling's solution. "If a solution of cupric sulphate be mixed with a sufficient quantity of saccharine liquid, no precipitate of $CuO$ takes place on addition of caustic potash. The liquid acquires a blue colour, but remains perfectly clear. On raising the fluid to the boiling point, if solution contains cane sugar only, nothing occurs, but if glucose be present a yellow precipitate of hydrated cuprous oxide is produced, which quickly turns to $Cu_2O$ and acquires an orange-red colour. If the glucose be present in excess the blue colour entirely disappears. Instead of relying on the saccharine matter for the prevention of the precipitation of the blue cupric hydrate by the alkali, it is far better to employ tartaric acid or a tartrate, as in Fehling's solution" (Allen's 'Commercial Organic Analysis').

The objections to Fehling's solution are, first, to be accurate, it must be made fresh, and, secondly, in a deeply coloured solution it is difficult to observe when the reaction is complete, owing to the red colour of the $Cu_2O$ blending with the blue of the solution.

Dr. Pavy's modification is based upon the fact that while cupric hydrate is precipitated by glucose, in the presence of ammonia it does not precipitate, but is dissolved to form a colourless liquid, the total disappearance of colour marking the close of the reaction.

Mr. Kinninmont uses a still further modification, one that commends itself for its simplicity in use. This is a solution of $CuSO_4$ in water and glycerin, so standardised that ½ oz. by measure will be completely decolorised by ¾ gr. of grape sugar in presence of ammonia.

The exact proportions are—

| | |
|---|---|
| Sulphate of copper ... | 90½ grs. |
| Water .................. | 2 oz. 225 gr. measures. |
| Glycerin, pure ...... | 4 oz. |

Filter.

Half an ounce of this solution, with an equal quantity of caustic potash solution and with excess of ammonia added, is boiled, and while boiling a known quantity of urine diluted with its own bulk of water is gradually run in, with the aid of a glass rod, until the blue colour of the copper is entirely gone. The amount of urine used for this purpose equals ¾ gr. glucose, and from this the amount of sugar per ounce is ascertained. The ammonia, by producing a layer of ammoniacal vapour above the liquid, prevents the access of air to the test. Notice that the blue colour returns as the liquid cools. This is perfectly accurate down to 1 gr. per ounce, but below that it is scarcely of any pathological importance.

Many other methods are in use, such as fermentation with yeast, when every degree of specific gravity lost represents 1 gr. glucose to the ounce; the depth of colour produced with picric acid compared with a standard coloured solution, etc., but the one I have mentioned is, from a druggist's point of view, the quickest and readiest.

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At the conclusion of the paper a vote of thanks was heartily accorded, the Chairman observing that such contributions were more directly serviceable to the members than the discussions at previous meetings.

The proposed Federation of Local Associations was then considered, and as the President, Mr. W. L. Currie, had been concerned in the inception of the project, he felt impelled, from a sense of duty, to come forward to speak on the subject.

Mr. Currie said he thought there could be no two opinions as to the necessity for such an organisation as was projected. True they had the Pharmaceutical Society, but for some reason or other its popularity had been much affected by its supposed apathy with respect to the trade at large. Now, if by means of Federation they could popularise the Pharmaceutical Society, he felt they should have done good work. How could that be done? The whole aim of the scheme was "Unity," and if by the aid of local associations they could induce every member of the trade to join such an association, and by-and-by become connected with the parent Society, they could have such a bond of union formed as would be able to carry any scheme to a successful issue. In some of the discussions which had taken place on this proposed Federation (journalistic and otherwise) its speedy collapse had been predicted, if it should even see the light of day, as it was asserted that up to the present its promoters had not been able to show any necessity for its existence. Well, as one of those whose name was attached to the circular calling the meeting, he could only say that if the feelings and expressions of opinion vented there gave any indication of what the general desire might be for such an organisation, its success should be guaranteed. But to tax those who called the meeting with being the promoters of an ambitious scheme, when in reality no scheme was discussed nor could be discussed, as the only point before the meeting was to discuss the desirability of forming a Federation, was not correct. They would have observed in a recent Journal that the Manchester Association had discussed the circular letter sent out, and that Mr. Kemp had enlarged to some considerable extent on the necessity for the existence of such a body. Well, it was not his intention to say much about the matter, but, during last session, they came to the unanimous conclusion that the only way of obtaining any united and concentrated opinion as to the best means of improving their position was by some such method as this. Individuals could do nothing. Local associations could do a little by discussing the ideas of its members, and deciding as to what they might consider the best means; but although a good decision might be arrived at thus, local associations only represent a very small portion of the trade. How was the remainder to be got at so that each association might know what the others had done? He thought the proposed Federation of associations, which was to consist of delegates from local associations, would supply the want, and by this means they could do almost whatever was required.

After furthur discussion by several members, Mr. Jas. Moir moved:—"That we heartily approve of the scheme of Federation, and agree to cast in our lot in giving it support."

Mr. Laing seconded, and the motion was put to the meeting and carried.

Mr. Moir proposed Mr. W. L. Currie as delegate, Mr. Jas. Abbott seconded, and the motion was carried.

Mr. Currie, in thanking the members for their confidence in him, said that his best services would be devoted to the interests of the trade at large.

A vote of thanks to the chairman terminated the business.

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## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The second meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, on Wednesday, November 22, at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, Mr. Alexander Sutherland gave a most interesting description of his experiences as a pharmacist during several years' residence in Burmah, and exhibited a large collection of characteristic Chinese paintings on rice paper and a number of photographic views.

Mr. Rutherford Hill gave an account of a botanical ramble in the Sevenoaks district of Kent, in company with Mr. E. M. Holmes, during last summer.

The following communication was then read—

### THE PHARMACY OF BROMOFORM.

BY WILLIAM LYON.

The common method of administering bromoform seems to have been as drops on sugar. This method is objected to by some physicians, and the reason they give is that sometimes those in charge of patients are not sufficiently careful in giving the exact number of drops, and I can readily believe there is some truth in what they say. The other methods mentioned are:—

1st—a solution in alcohol or in alcohol and water.

2nd—suspended in syrup or in water and sent out with a "shake the bottle" label.

This last method is not what one would call correct dispensing, and is open to serious objection. In the

'Transactions of the American Pharmaceutical Association,' Mr. P. W. Bedford suggests the following:—

Take of—

| | |
|---|---|
| Bromoform | 16 minims. |
| Alcohol | 2 drachms. |
| Glycerin | 12 drachms. |
| Compound Tincture of Cardamoms | 2 drachms. |

Mix in the order mentioned.

This makes a very good mixture, and, moreover, a palatable one.

Some time ago I was requested to prepare the following prescription:—

Take of—

| | |
|---|---|
| Bromoform | 20 mimims. |
| Rectified Spirit | 2 drachms. |
| Water to | 1 ounce. |

Mix. Take a teaspoonful in water every six hours.

The bromoform dissolved quite readily in spirit, but on adding the requisite quantity of water it quickly separated, and would not dissolve again on shaking. On communicating the result to the prescriber he gave instructions to use sufficient rectified spirit to get a solution. It was found necessary to use the spirit and water in the proportion of five to three before a satisfactory solution could be got. This overcame the difficulty so far as the dispensing of it was concerned, but unfortunately the susceptibilities of the patient (a child of three years) to the intoxicating affects of alcohol were greater than the prescriber had calculated upon, as it became partially intoxicated after taking the second dose. A continuation of the medicine in that form was therefore out of the question, and a method of giving it in solution, without the presence of such a large percentage of alcohol, had to be found. It is not very soluble in water (1 part of bromoform requiring about 550 parts of distilled water), and an aqueous solution may be passed over, as the quantity required to be taken each time would be inconveniently large. It is readily soluble in oil of almonds, olive oil, and cod-liver oil, and these might in some cases be suitable vehicles for its administration. Gelatin capsules would also be a good method, but for most children these are not available, on account of them being either not able or not willing to swallow such. In emulsifying it four different agents have been tried, viz., mucilage of acacia, mucilage of tragacanth, mucilage of Irish moss, and tincture of soap bark.

1. *Mucilage of Acacia.*—

| | |
|---|---|
| Bromoform | 20 minims. |
| Mucilage | 2 drachms. |
| Water to | 1 ounce. |

Prepared in the usual way this gives a fairly satisfactory result. On keeping, a sediment forms, but it is readily distributed through the water when the bottle is shaken.

2. *Mucilage of Tragacanth.*—This is a failure. The bromoform very soon separates.

3. *Mucilage of Irish Moss.*—When used in the same proportion as the mucilage of acacia the result is very similar, and after a time a sediment also forms, but it is more easily distributed through the water when the bottle is shaken.

4. *Tincture of Soap Bark.*—

| | |
|---|---|
| Bromoform | 20 minims. |
| Tincture | 2 drachms. |
| Water to | 1 ounce. |

This appears all right at first, but the bromoform very soon separates.

Reviewing these results, the conclusion arrived at is that where alcohol is admissible the glycerin and alcohol mixture suggested by Bedford is undoubtedly the best, but where not, then either a solution in oil, or an emulsion with mucilage of acacia or Irish moss might with propriety be utilised instead.

The reading of the papers was followed by a discussion taken part in by Messrs. Dey, Duncan, Hill, Lyon and Sutherland, and on the motion of the Chairman, a cordial vote of thanks was awarded to the authors.

## EDINBURGH AND DISTRICT CHEMISTS' TRADE ASSOCIATION.

A meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, on Friday, November 24, at 10.30 a.m., Mr. G. H. Laird in the chair.

The minutes of last meeting were read and approved.

The Secretary, Mr. C. F. Henry, read a letter from Mr. J. Laidlaw Ewing, handing over a balance of £9 which belonged to the late Edinburgh Price List Committee. It was agreed to send a letter of thanks for the donation.

The Secretary intimated that the Committee had arranged to have regular meetings of the Association in November, January and March, in addition to the annual business meeting in May. For the convenience of country members the meetings would be held alternately at 10.30 a.m. and 9 p.m.

The Secretary stated that the Committee had sent a letter to the Council of the Pharmaceutical Society on September 30 last, with reference to the Medicine Stamp Act. The letter put three questions, as follows: 1. Is there any foundation for the statement that the Council was invited to confer with the Inland Revenue Department, and refused? 2. If so, would the Council favour the Association with their reasons for such refusal? 3. Would the Council have any objection to represent the trade in a conference with the Inland Revenue authorities on the points referred to by Sir Walter Foster on July 22nd last? A reply of date November 2 had been received from Mr. Bremridge, giving the decision of the Council as follows:—"That whilst admitting that the administration of the Stamp Acts may, in some cases, be unequal, we are of opinion that any alteration of the law as it stands would be to the disadvantage of chemists and druggists, and not to their advantage. We are further of opinion that it would be impolitic to take any steps to bring about an interview between representatives of chemists and druggists and the Board of Inland Revenue."

Mr. Bremridge further stated that the Society had never been invited to advise the Board of Inland Revenue as to the amendment of the Medicine Stamp Act.

The Chairman said it was for the Association now to say what should be done. It was evident that the Council was not prepared to do anything, and the members of that body ought to know what was best for the interests of the trade.

The Secretary said they might draw up a statement of their grievances and submit it to the Board.

Mr. Boa said he did not see that they could do anything with the letter beyond acknowledging it, and saying how much they were obliged to them for the trouble they had taken. So far as the Council was concerned, the matter had come to a conclusion. His view of the matter was that the Act should be abolished, but after reading the discussion at last Council meeting he began to think that surely his view must be the result of some ignorance or want of information. When such a body as the Council said it was undesirable to make any alteration it looked presumptuous for him to say he held a different opinion. He would put before them one or two considerations which led him to this view. This Act came into existence about eighty years ago, at a time when the Government wanted money, and it was decided to tax proprietary medicines or nostrums. There was evidence, he thought, in the Act that it was not intended to interfere with or tax legitimate medicines.

The reference in the Act to medical men and druggists who had served a regular apprenticeship indicated that they were to be exempted from the provisions of the Act, and it was not intended to tax medicines whose constitution and effects were well known. He was inclined to think that if there had been an official register of chemists and druggists at the time the Act was passed, they would all have been exempted. In the absence of such a register all that could be done was to define the persons to be exempted in the way he had pointed out. He thought also that the Act had served its purpose in helping the Revenue at a time of stress, and in restraining the operations of those who were disposed to dabble in quackery. Now the circumstances were entirely changed, and the provisions of the Act were being stretched in administration so as to lead to much inconvenience and injustice. Even the officials admitted that it was difficult to administer the Act with impartiality and justice. Then, with regard to the Government stamp, chemists had been the principal medium as sellers of stamped medicines, and in this way had, in the public mind, become associated with quackery. This had caused a certain character to attach to the chemist which he was not justly chargeable with, and which was, he believed, distinctly hurtful to the trade. He thought that now there was a widespread desire on the part of chemists and druggists to be emancipated from any suspicion of quackery. It had been said that to abolish the Act would encourage the putting up and hawking of medicines and nostrums by all kinds of hucksters and small dealers. He had had some experience in Ireland, where there was no Stamp Act, and his experience proved that no such result would follow. Ireland, on account of deficient education and prevalent superstition, offered a particularly likely field for extensive quackery, but no such condition of things existed, and the relationship between the medical profession and the pharmacist was closer and more satisfactory than in this country. It had been said that it was a mistake to give too much information on a label to the public. That was not his experience, and he thought that the more information you gave the more medicine they were inclined to use. He thought the Act was a distinct barrier to the spread of information that would be for the good of all concerned. In the case of a cough mixture for a poor person, it should be obtainable as cheaply as possible, and it was hard to compel them to pay 1½*d.* or 1*d.* for a stamp if directions were put upon the label. In the case of ipecacuanha wine, tincture of rhubarb, and such like, they ought to have permission to state the dose and the legitimate use of the medicine. It was essential that they should, in conducting their business, give such desirable information, and it was not right that the purchaser should have to pay a tax for it. For these reasons he thought the Act ought to be abolished.

Mr. McLaren said he did not quite agree with Mr. Boa. There was no Medicine Stamp Act in the United States, and yet it was admittedly the great home of quacks and quack medicines. He thought also that a medicine should be stamped when the proprietor claimed an exclusive right to it. The Revenue authorities ought to be pressed to allow them to put the dose on any B.P. preparation, and also to state if it was for a cough, or diarrhœa, or indigestion, and so on. He thought the result of Lord Wolmer's action was to show that they could not get the Act repealed. He was a free and also a fair trader, and he thought foreign nostrums should also be made to pay a tax. It was also a pity that in all these prosecutions the defendants had paid the £2, or whatever the fine was, to get the matter quietly settled. They ought to contest the point and have the question clearly settled. He had come to the conclusion that it would be a mistake to abolish the Act; that it was an advantage to have all strictly proprietary medicines stamped; and that they should press the Inland Revenue for liberty to label in any way they chose such articles as sal volatile, ipecacuanha wine, and tincture of rhubarb.

Mr. Wylie said he agreed with Mr. McLaren, and thought the Act should be amended but not repealed. It had been said doctors would object to doses, etc., on the labels. They should not consider them, as a large part of their trade was quite apart from the doctors. One advantage in having directions printed on the labels would be that young assistants would not be called upon for instructions over the counter.

Mr. Glass said he agreed with Mr. Boa, but thought there was no hope of getting abolition, and therefore he would rather go in for amendment. He thought they should seek the exemption of all medicines where the composition was distinctly stated on the label.

Mr. Forret said he thought they should seek the amendment of the Act so as to allow all official and officinal medicines to be exempted. He meant all medicines recognised in standard books.

The Secretary said in any attempt at abolition they would immediately be met with the question: "Where is the money to be got?" It had been suggested that the money might be got by a new duty on sellers of medicine on the basis of shop rental. He thought that was a fair way to levy rates. It was suggested that there should be a tax of two per cent. on the rental, but that would not amount to more than a quarter of the revenue under the present Medicine Stamp Act. They could not, therefore, suggest abolition, but should seek amendment so as to carry out the real spirit of the Act rather than what seemed to be the letter of it.

The Chairman said he thought there was something in the argument, that had there been a register of chemists and druggists when the Act passed they would have been exempted. It was clear that they could not go in for abolition of the Act, and he thought they ought rather to seek some amendment.

After further discussion, Mr. Boa moved, seconded by Mr. Bowman:—"That the Medicine Stamp Act be abolished."

Mr. Glass moved, as an amendment, seconded by Mr. Forret:—"That they agitate for an amendment of the Medicine Stamp Act, and instruct the Committee to consider the matter and report to next meeting."

On a vote being taken, two voted for the motion and eleven for the amendment, which was declared carried, and Mr. Glass was added to the Committee.

Mr. Smith referred to the sale of a soluble blue made with oxalic acid and sold by grocers, and moved, seconded by Mr. C. F. Henry:—"That a special committee be appointed to inquire into the extent of the sale of said soluble blue by grocers, and report to next meeting."

Mr. McLaren moved:—"That this Association take no steps in the matter."

The amendment not being seconded, the original motion was declared carried, and the Special Committee was appointed as follows:—The Chairman and Secretary, and Messrs. Alexander, Anderson, Bowman, Clark, Dick, Glass, Lawrie, and Miller.

This concluded the public business, and the Association afterwards sat in private.

## LIVERPOOL CHEMISTS' ASSOCIATION.

The members of this Association held an enjoyable smoking concert at the Alexandra Hotel, Dale Street, on Tuesday, December 5. The chair was occupied by Mr. J. Hocken, President of the Association, and the company present numbered about fifty. Amongst those who contributed to the evening's enjoyment were Messrs. W. A. Hughes, P. A. Hughes, Birchall, F. L. Joseph, S. Arthur, and W. H. Jackson (pianist).

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

A meeting was held on Thursday, November 30, Mr. Frank Walker, President, in the chair. Four new members were elected. Mr. Birchall exhibited some chlorate of potassium, which did not answer the usual tests, and it was suggested that samples be taken and examined. The President brought several dispensing queries before the meeting, which raised a lively discussion. On the question of the correct meaning of "pil. opii, gr. ½," the usual difference of opinion was expressed by the members, but it was generally agreed that it was not altogether wise to have pil. opii as an official synonym for pil. saponis co. Mr. H. Roberts then read a paper on "American Pharmacy," and, afterwards, Mr. S. C. Sproat dealt with "Cremation as a Sanitary Agent." A discussion followed the reading of the papers, and the debate on "Pharmaceutical Ethics" was postponed for want of time until December 21.

## THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

A committee meeting of the above Association was held on the 6th inst. at the Foresters' Hall, Plymouth, Mr. J. G. Netting, President, in the chair, when it was decided to hold the next quarterly general meeting at the same address on January 17 next. The Secretary, Mr. James Cocks, reported an enrolment of sixty-eight members.

# Parliamentary and Law Proceedings.

### Poisoning by Carbolic Acid.

In the House of Commons, on Thursday, November 30,

Mr. Macdona asked the Home Secretary whether, in view of the increase of suicides from carbolic acid, he would instruct the Coroners under his control, in their returns, to state on the certificates which they sent to the Home Office the name of the poison by which the suicide was effected, with a view of attracting public attention to the matter.

Mr. Asquith: I have considered this matter, but do not find any sufficient reason for introducing the proposed change.—*Times.*

In the House of Commons, on Thursday last,

Mr. Macdona was expected to move for a return of the number of deaths in England and Wales in each of the five years from 1887 to 1891, inclusive, which were caused by the taking of carbolic acid, distinguishing males and females, and showing the number of such deaths due to (1) accident, (2) suicide, and (3) murder and manslaughter. This was in accordance with the promise of the Secretary of the Local Government Board, on the 24th ultimo, that such a return should be granted if moved for.

### Prosecutions under the Pharmacy Act at Linlithgow.

In the Sheriff Court House, Linlithgow, on Wednesday, December 6, Sheriff Melville disposed of four cases at the instance of Richard Bremridge, 17, Bloomsbury Square, London, W.C., Registrar under the Pharmacy Acts, 1852 and 1868.

Mr. Peter Morison, S.S.C., Edinburgh, and Mr. E. Peterkin, solicitor, Linlithgow, conducted the prosecution. The first case was against Thomas Dymock, ironmonger and seedsman, 57, High Street, Linlithgow, for selling a quantity of arsenic in a packet of Cooper's Sheep Dipping Powder, and a quantity of corrosive sublimate in a bottle of Cuff's Fly Oil, on September 8, 1893, he not being a registered pharmaceutical chemist or a chemist or druggist.

Mr. William Strachan, solicitor, appeared for the defendant, who pleaded guilty.

Mr. Strachan said he would like to explain that in this case, although the poisons were probably sold on that date mentioned, they were not sold by the accused, but by someone else in the shop. This was the first case of the kind in Scotland, notwithstanding the fact that these articles had been sold by grocers all over Scotland for a great many years. These articles were like patent medicines in respect that they were put up by the manufacturers, and all that the seller did was to hand them over the counter to any farmer who might ask for them. His client did not know that he was committing any offence in selling them. He supposed it must be a fact that they contained a poison, but there was nothing on the packet or bottle to indicate that they contained any poison within the meaning of the Pharmacy Act.

Mr. Morison said Mr. Strachan was introducing controversial matter. He would prove that the accused himself sold these poisons, and the Cooper's Sheep Dipping Powder was labelled poison.

Mr. Strachan said it might be labelled poison, but that did not prove that it contained a poison within the meaning of the Pharmacy Act. There were many poisons such as carbolic acid which could be sold by any one. What his client had done was done innocently, and he thought it was a hard thing that this Society, which acted for chemists alone, should have prosecuted without any warning. Had his client been warned he would have looked into the matter, and the offence would not have been committed. In the whole circumstances he thought this case should be withdrawn.

The Sheriff: You may take it that the case will not be withdrawn.

Mr. Morison said he would admit that this was the first case of the kind in that district, but they had had many such prosecutions throughout the country. He would also point out that in the sale of the sheep dip there was not only a contravention of the Pharmacy Act, but also a contravention of the Arsenic Act, for this article contained a considerable proportion of arsenious acid or white arsenic. There was in the packets as much arsenic as would poison a large number of people, and it could be readily extracted by the simple expedient of infusion in water. It had been alleged that the Society acted only for chemists and druggists. He most distinctly controverted that statement. It acted in the interests of public safety and by express authority of the Legislature. By recent actions the Treasury had indicated that the provisions of the Pharmacy Act must be enforced. In England the coroners at inquests had frequently drawn attention to the disastrous results of a loose way of selling powerful poisons, and it was the imperative duty of the Society to put a stop to such practices.

The Sheriff: Will you tell me about this Society?

Mr. Morison: It is acting under a Royal Charter confirmed by two Acts of Parliament, and Mr. Bremridge is the sole prosecutor appointed by the Legislature to administer the law in cases of this kind. We have had many such cases. There were several in Edinburgh in 1887, which must have been heard of in Linlithgow, and I have here a report of a conviction for the sale of Cooper's Sheep Dip in the Ludlow County Court in 1875. It had been said they should give some warning, but the only effectual warning was a prosecution such as in this case. This was a case in which his lordship should inflict such a penalty as would put a stop to these practices and to the sale of these powerful poisons by all and sundry. He might say that in this very case the accused still exhibited a Cooper's Dip advertisement on his shop.

The defendant: That is an untruth. It was removed yesterday.

Mr. Morison: I saw it this morning myself, but it is admitted that up till yesterday it was there. He left the case in his lordship's hands to impose such a penalty as would be adequate to put a stop to this dangerous practice.

The Sheriff: What are the expenses in these cases?

Mr. Morison: In other cases we have got modified expenses of £2 2s.

The Sheriff: I will hear the other cases.

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The next case was against John Braes, grocer and ironmonger, 186, High Street, Linlithgow, for keeping open shop for the sale of poison, having sold arsenic in Cooper's Sheep Dipping Powder and corrosive sublimate in Cuff's Fly Oil, on September 8, 1893.

The defendant pleaded guilty, and

Mr. Morison said he would accept the same statement, and had to make the same reply as in the previous case.

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The next case was against Charles Mitchell, grocer, 175, High Street, Linlithgow, for keeping open shop for the sale of poisons, having sold morphia and chloroform in a bottle of Dr. J. Collis Browne's chlorodyne on September 8, 1893.

Mr. P. Miller, solicitor, appeared for the defendant, who pleaded guilty.

Mr. Miller said his client purchased this business from a Mr. Robertson, who sold patent medicines a few months before this offence was committed. His client did not intend to sell these articles, and did not renew his licence. He was not even aware that there was chlorodyne in the stock, and his lad, who had been with Mr. Robertson, sold it in this case.

Mr. Morison said he accepted the statement made by Mr. Miller. It was necessary to bring this matter into court, that grocers in the district might know that they must not sell these articles. If the defendant would give an obligation to stop all such sales, the prosecution was willing to withdraw the case.

Mr. Miller: My client at once consents to give such an obligation. He has no intention to continue such sales.

Mr. Morison withdrew the case.

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The next case was against Peter E. Reid, for selling oxalic acid on September 6, 1893, and again on September 8, 1893, in the shop of David Archibald, chemist, 67, High Street, Linlithgow.

The accused, who appeared for himself, pleaded guilty, asked leave to say that on the dates libelled Mr. Archibald was ill, and in the doctor's hands, and could not attend to business. Had that not been so these offences would not have been committed.

Mr. Morison said he could not accept that statement at all. He thought this case was a complete answer to the allegation of his friend Mr. Strachan, that this Society acted solely for chemists. This was a case of a chemist who conducted his business in such a way that the accused was allowed to sell poisons freely, without any supervision whatever. It mattered not whose shop the offence was committed in, the Society must interfere to see that the public was protected against the sale of poisons by unqualified persons like the accused, whether in the shop of a registered chemist or in any other shop whatever. This chemist knew right well what the law required, and his lordship ought to impose a penalty that would bring home to him the necessity for a proper observance of the provisions of the Act of Parliament in conducting his business.

The Sheriff: It seems this Society has not been very active in its operations. When it does come here it brings up three cases all at once. If the Society is to do any good at all, it really should have been looking after things long ago, and not allowed it to go on as long as it did. The Society seems not to have been conducted at all as the Legislature—if it is the Legislature that empowers it—demands. It seems a great pity that prosecutions of this kind should be entrusted to a Society which does not do its work, because it is a notorious fact that these poisons have been sold openly, and everybody knew that this "Sheep Dip" had been sold by grocers for a very long time. It is a great pity that the prosecution is left in the hands of a Society of this kind, because it is quite clear that the Society has not done its duty. They have come to Linlithgow, and dropped upon three people, and very properly too, and the question comes to be, what should be done with these shopkeepers. These people no doubt had been led astray by the fact that the Society has not been doing its duty, and though these four people have been brought up to-day, they did not know that what they were doing was wrong. I am inclined to treat the cases as leniently as I can. The last case, however, is very different. It is a very serious matter that poisonous drugs should be in the hands of a person who is not qualified by law to sell them. The other two are not so serious. I have no doubt they were acting innocently, and quite in ignorance. The penalty in the case of Reid will be 10s. for each offence, and £2 2s. of expenses. In the cases of Dymock and Braes, I think it will be enough to inflict a nominal penalty of 1s. and £1 of expenses. I may say that I am glad to see the Society showing signs of taking some action in these matters.

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### PROSECUTION UNDER THE PHARMACY ACT AT HULL.

At the Hull County Court on Wednesday, William Pattinson Hayton, 117, Wincolmlee, was sued before His Honour Judge Bedwell, for £5 penalty, for selling poison contrary to the provisions of the Pharmacy Act, he not being a registered person under the Act. Mr. W. R. Gray, barrister, appeared on behalf of the Pharmaceutical Society of Great Britain. The defendant did not put in an appearance in court. From the evidence it appeared that on September 11 last, Mr. Jonathan Mitchinson purchased from the defendant two pennyworth of soap liniment and two pennyworth of laudanum. Further evidence was given to show that the laudanum supplied was poison, and that the defendant was not registered under the Act to sell poisons. His Honour gave a verdict for the plaintiffs, with costs on the higher scale.

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## Obituary.

### GEORGE BAGGETT FRANCIS.

We record with regret the death of George Baggett Francis, the senior member of the firm of Hearon, Squire, and Francis, who passed away at his residence, "Inglesby," Hertford, on the 2nd inst., in his seventy-third year. The deceased was born at Woodbridge and educated at a private school at Aldeburgh. Among his fellow pupils was the late W. V. Wright, with whom in after life he had intimate business relations. After serving an apprenticeship with his father, who was a chemist and druggist at Woodbridge, he entered in 1841 the now historic house of John Bell, whose second assistant was the senior Francis. In 1845 he was promoted to the charge of the laboratories in succession to Mr. Scholfield, and four years later to the post of "housekeeper." Owing to a severe illness he resigned his position at Bell's after fifteen years' service. During that time he had the happiness to be associated with such men as Thomas Hyde Hills, Robert (now Emeritus Professor) Bentley, Middleton, Barnard, and Merrell, all of whom, with one exception, he survived. In 1856 he purchased the old-established business of Hallows, in Islington, but after a brief tenure relinquished it in favour of an overture made to him by his old schoolfellow, Wright, with whom he entered into partnership at Old Fish Street, under the style of Wright, Francis and Co. In 1865 he dissociated himself from Wright and joined the late William Squire, who was at the time the only acting partner of Hearon, McCulloch and Squire. His connection with this firm, hereafter known as Hearon, Squire and Francis, continued to the day of his death. A paralytic seizure in 1881 incapacitated him from again taking an active share in the conduct of his firm's business. From that date he gradually became more and more feeble, but retained his mental faculties to the last. He leaves a widow and seven children. The funeral, which was of a quiet, simple character, took place at the Cemetery, Hertford, on the 6th inst. The deceased took an intelligent interest in the proceedings of the Pharmaceutical Society. Following the bent of his mind, he devoted himself to the manufacture of pharmaceutical preparations rather than to the buying of crude drugs. Laboratory utensils and processes had a special charm for him, not to be approached by the fluctuations of the market. To his employés he was gentle, considerate, and sympathetic, and naturally shrank from the obligation of administering a rebuke. He elicited rather than commanded obedience, for his orders as a master were couched in the form of requests. In business life one prime quality stamped the man—conscientiousness. In private life he was unobtrusive, unselfish, and abiding in his friendships.

## GEORGE STANBURY PEDLER.

At the ripe age of eighty years, one of the remaining founders of the Pharmaceutical Society passed away on December 2, in the person of Mr. G. S. Pedler, of Lordship Lane, Dulwich, and formerly of 199, Fleet Street. Mr. Pedler always took a great interest in the affairs of the Society, and for many years was a regular attendant at all its meetings. He was also for some considerable time a member of the Common Council, and, as Chairman of the first Sanitary Committee of the City of London instituted regulations to guard against cholera in 1849. His son, Arthur, was the Junior Bell Scholar in 1866, and is now Professor of Chemistry in the University of Calcutta, and another son is a medical practitioner at Knightsbridge.

Notice has also been received of the death of the following:—

On the 19th of November, William Luff, Pharmaceutical Chemist, Oxford. (Aged 83 years). Mr. Luff had been for a long time associated with the staff and work of the Radcliffe Observatory as Computer to that establishment, and performed the greater part of the calculations in the first Radcliffe Catalogue of Stars. Mr. Luff had been a Life Member of the Pharmaceutical Society since 1853.

On the 1st of December, Frederick Green, Chemist and Druggist, of Pokesdown, Bournemouth. (Aged 36 years).

On the 2nd of December, George Stanbury Pedler, Chemist and Druggist, Dulwich. (Aged 80 years). Mr. Pedler was one of the founders of the Pharmaceutical Society.

On the 2nd of December, at Hertford, George Baggett Francis, Pharmaceutical Chemist, of the firm of Hearon, Squire and Francis, Southwark Street, London. (Aged 72 years).

On the 2nd of December, at Taibach, Glam., Joseph Phillips Williams. (Aged 38 years). Mr. Williams was formerly in business at Aberavon.

## ANSWERS TO CORRESPONDENTS.

*R. H.*—Probably what you require is boric acid in exceedingly fine powder, or a mixture of this with borax or starch. See 'Extra Pharmacopœia,' under heading "Acidum Boricum."

*A. B.*—The *Revue mensuelle analytique*, which is evidently the paper you require, is published by Vve. Jacques Lechevalier, 23, Rue Racine, Paris.

*W. E. Barker.*—The only book in your list of any great value to you is the 'Selecta è præscriptis.' You should get Ince's 'Latin Grammar of Pharmacy' (Baillière); Edmond's 'Botany' (Longmans); Bentley's 'Organic Materia Medica' (Longmans); Thorpe's 'Inorganic Chemistry' (Collins); Attfield's 'Chemistry' (Gurney and Jackson); and the British Pharmacopœia.

"*Walter.*"—You will find the particulars you require in the 'Extra Pharmacopœia,' under the heading "Coca."

## NOTICES OF MEETINGS NEXT WEEK.

### Tuesday, December 12.

*Photographic Society of Great Britain.*
"The Distribution of the Image on Multiple Films," by S. Herbert Foy.
"Observations on the Lumière-Lippmann Colour Photographs," by F. E. Ives.

*Pharmaceutical Football Club*, at 8 p.m.
Smoking Concert at the Freemasons' Tavern, Mr. M. Carteighe in the chair.

*Sheffield Microscopical Society*, at 8 p.m.
"Insectivorous Plants," by Rev. T. S. King.

*Birmingham and Midland Pharmaceutical Lady Students' Association*, at 4.30 p.m.
Meeting at the Women's Hospital, Upper Priory, Birmingham.

### Wednesday, December 13.

*Sheffield Pharmaceutical and Chemical Society*, at 8.30 p.m.
"Eyes and Dyes: a Discourse on Colour Vision," by A. H. Allen.

*Brighton Junior Association of Pharmacy*, at 9 p.m.
Social and Musical Evening.

*Manchester Pharmaceutical Association*, at 7.30 p.m.
"Hydroxyl and its Compounds," by Charles Turner.

### Thursday, December 14.

*Chemists' Assistants' Association*, at 8.30 p.m.
"Pharmaceutical Training; as it is and as it should be," by H. A. D. Jowett.

*Midland Pharmaceutical Association.*
Smoking Concert.

### Saturday, December 16.

*Pharmaceutical Football Club v.* Southall, at Southall, at 3.15 p.m.

*Reserves v.* Noel Park Reserves, at Shepherd's Bush.

## BOOKS, ETC., RECEIVED.

A Table of Organic Materia Medica; comprising an Abbreviated Description of the Animal and Vegetable Substances of the British Pharmacopœia, 1885, and its Additions, 1890; also of many non-official drugs in common use. By George Stirling. Second edition. London: John Gower. Pp. 44. 1s. 6*d*. From the Publisher.

Annales de l'Institut botanico-géologique colonial de Marseille. Publiées sous la direction de M. le professeur Edouard Heckel. Pp. 31. Illustrated. Paris: Société d'éditions scientifiques. From the Editor.

Communications, Letters, etc., received from Messrs. Barnes, Bell, Hill, Nagelvoort, Smith, Thompson.

# THE PHARMACEUTICAL MEETINGS AT CHICAGO IN 1893, WITH SOME NOTES ON AMERICAN PHARMACY.*

BY N. H. MARTIN, F.L.S., F.R.M.S.,

*President of the British Pharmaceutical Conference, Delegate from the Pharmaceutical Society of Great Britain to the American Pharmaceutical Association and to the Seventh International Pharmaceutical Congress at Chicago.*

I had, as a member, determined to attend the meeting of the American Pharmaceutical Association at Chicago, and to this circumstance was due the fact that the Council of the Pharmaceutical Society did me the honour to appoint me as one of the delegates to that body, and also to the International Congress which was to meet in the same city immediately after. Through the courtesy and acquiescence of my distinguished colleagues, Mr. Carteighe and Mr. Martindale—who are always with you here in London—I have been invited to give you an account of my journey to Chicago and of some of the impressions which I have received concerning pharmacy in America. This was my second visit to the United States, and many of the ideas and opinions which I had formed as the result of my first visit have been altered or modified by my second, so that without making any claim to know the minutiæ of the practice of pharmacy in a country so vast as the United States, I do venture to think that the opinions I have formed are based upon a reasonably accurate acquaintance with, and interpretation of, the facts of the case and of the conditions which exist. I have had the pleasure of visiting most of the large cities east of Chicago, as well as some of the smaller towns. I have visited and gone carefully over the works of several wholesale and manufacturing firms, and have observed from the outside and the inside many hundreds of retail pharmacies. I have had the privilege of hearing the discussions at the various pharmaceutical meetings which were held at Chicago, and have had conversations with professors and pharmacists from a great number of the States and cities of the Union. From these several sources I have gleaned certain facts and formed opinions, but in stating them to you I shall almost without exception refrain from mentioning the names of States, colleges, and persons, so that my remarks may be as free as possible from personal considerations, whether I appear to admire or to criticise.

Before I touch on pharmacy, just a word as to the journey, as to travel in America, American scenery and, above all, American hospitality. The ocean journey has been so often described that I can scarcely add to it. A journey to New York is no more exciting than a trip to Paris, except that it occupies a few days instead of a few hours; the Atlantic journey is accomplished with so much precision that you may predict within narrow limits the time you will dine in New York or Liverpool. Much of the steamboat travelling on the great rivers in America is delightful, but the comforts and luxuries of their railway service are greatly over-rated. There is simply no comparison between the smooth precision with which our trains run and the rollicking motion of an American express. Of course it varies, and sometimes for a few miles the train runs smoothly enough, but at other times it rolls and rocks worse than a ship does at sea, except in a storm. With regard to all the accommodations for day and night travel, the Americans have such long distances to cover that they make the best of it, and that is all I can say in its praise. I once heard of a very pious lady who, having a great horror of the sea herself, held strongly to the opinion that God never intended man to cross the ocean, and hence he sent him sea-sickness as a punishment for his temerity. If the old lady had said God never intended a Christian to live on a train—even the most luxurious specimen of an American train—day and night for a week, I should have felt heartily inclined to agree with her. I must not detain you with any detailed account of American scenery. New York Harbour, New York City, Boston, Philadelphia, Washington, the Hudson, Lake George, the mountains in the vicinity, Niagara, and a host of other places on the eastern border are worth crossing the Atlantic to see and visit, and if any of my pharmaceutical brethren are tired and jaded with work they cannot possibly do better than to take a trip to America. And now, what shall I say of American hospitality except that it is genuine, hearty, sincere, and as big as their great continent. I am convinced that it springs from a deeper source than community of interests in the same pursuit, and dates as they would say "way back" in the decades and the centuries whence we have sprung from the same source; and the history as well as the literature, the discoveries and the triumphs of our race are the joint heritage of America with ourselves.

Chicago well maintained the honour and reputation of America in this particular, and those of us who enjoyed the warmth and splendour of her private and public hospitality will ever treasure the reminiscence as one of the bright and happy experiences of our past. Personally, I have only one complaint, and that is that they were a little too exacting in their desires that I should "say something." To my colleagues, of one of whom it is written that "he always commanded attention whenever he took the floor," and of the other, that "his tall, dark, and manly physique distinguished him whenever he rose in convention, and his remarks were always to the point," this was no hardship, but to one so unskilled in public speaking as I am, and who always remembers the thing he ought to have said after he sits down, it was embarrassing, and would have been more so except for the manifest courtesy and kindness of the listeners, who seemed to know what I ought to have said, and who were sure I would have said it if I could. I am not going to entertain you with newspaper and journal paragraphs about the English delegates, but there is one sentence of a personal character which I hope you will forgive me for transcribing. The writer says "Mr. N. H. Martin, of Newcastle-on-Tyne, did not speak as frequently as other visitors from across the seas, but he was valuable in committee work, and added his share to the success of the International Congress, and kept up the dignity and reputation of our English cousins." I do not know the writer, but I thank him for the kindest thing he could have said about me, and I hope my colleagues on the Pharmaceutical Council, who know my preference for work in committee over speeches in Council, will be pleased that the same spirit animated me in Chicago. I may say, however, that several times it happened that our President had so well expressed my views and opinions as well as his own, on the subject under discussion, that I felt it was unnecessary to take up the time of the members with any remarks of mine, and I preferred to sit and listen to others.

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* Read before the Pharmaceutical Society of Great Britain at an Evening Meeting in London, December 13.

With regard to the American Pharmaceutical Association, I was exceedingly disappointed to reach Chicago a day too late to hear the President deliver his inaugural address, for although I have read it in print it would have been a treat to have heard it first from the lips of its author. My friend Martindale removed the traces of the railway journey more quickly than I did, and hurried off to the meeting, so that when I arrived he was already seated among the elders in the odour of sanctity. When I came in, a paper was being read, but at the next interval I was invited to the front also, and received a most cordial welcome from President Remington, which appeared to be endorsed by the members present. The papers were then resumed, and I heard some of them read and discussed. Printed copies of the papers were handed around the room as soon as the authors commenced to read them, and as it was my first experience of this being the case I should like to tell you how it impressed me. It seemed to take all the interest out of the paper for the majority of the audience, who could go on with their private conversations during the reading, and yet by glancing over the printed paper could keep themselves abreast of the main idea in it. The effect was that the reader, instead of having an alert, attentive audience, appeared to be performing some sepulchral rite, but when he ceased the critics were very much on the alert in the discussion. The American Pharmaceutical Association is carried on in three sections, one is styled the section on Scientific Papers, another the section on Education and Legislation, and the third the section on Commercial Interests. The section on Scientific Papers was carried on until nearly 11 p.m., and as I was not aware that there would be such a late sitting I missed a considerable part of it. The papers were varied and practical in their character, and the discussions were participated in by a number of members with considerable spirit. There were several very interesting papers presented to the section on Education and Legislation, but one thing struck me very forcibly, and that was the volubility with which men read papers and discussed views and practices without the least intention or thought that they would have a practical bearing. It all seemed academical and inconsequential, and for such an intensely practical people as we usually think the Americans to be, it seemed to me a waste of time. Another striking feature was the frequent appointment of "committees of three." The President's address, instead of being made the subject of a vote of thanks immediately after its delivery, as it would be with us, was referred to one of these committees of three. The result was that no piece of business was debated and finished straight away, but there was an endless succession of appointments of committees and receiving of reports. The latter were frequently interpolated between the reading and discussion of some interesting paper, and formed an interruption which was anything but valuable in the elucidation of the particular subject which was at that moment before the meeting. The appointment of these committees was so informal that it sometimes happened that committees were appointed the members of which were entirely unconscious of it until months after. It was no one's special duty to apprise them of their appointment or to summon them to discuss the subject for the purpose for which they were nominated.

The section on Commercial Interests was vastly entertaining, but certainly not profitable. All that can be said is that they met, they discussed, they sometimes passed resolutions, and they adjourned until another year. A considerable degree of heat and temper was manifested during the discussions in this section, but immediately after the adjournment the resources of Chicago provided an efficient antidote, and it was not long, after the evening meeting, before goodwill and friendship again reigned supreme. An attempt is sometimes made to induce this Society and the Pharmaceutical Conference of this country to take up what are called "trade matters" (the regulation of prices and so forth). If the men who are so anxious upon this score, and so sanguine that good could be accomplished thereby, could see how little it does in America, I think they would cease their demands.

The dominant feature of the American Pharmaceutical Association was the publication and presentation of the first copy of the United States Pharmacopœia, which, although it is called the Seventh Decennial Revision and is dated 1890, was not published until August, 1893, and is not to be the official guide until January 1, 1894. You have all seen reviews and notices of this volume, and I have not yet had time to examine it with sufficient minuteness to add to what has been written, so far as the intrinsic merits of the details of the book are concerned, but I think every one who has had an opportunity of even the most cursory examination of it will agree with me that it is a volume of which the Americans may be justly proud. The Historical Introduction, which gives us details of the genesis of this national pharmacopœia, is full of interest, and from it we learn that up to 1840 the Pharmacopœia Committee had been composed entirely of delegates representing medical societies, although "valuable assistance was rendered to the Committee by the colleges of pharmacy." Before the Committee of 1840 separated, however, provision was made for a Convention to meet in 1850, and in this resolution it was decided to invite "incorporated colleges of pharmacy" to send delegates to that general convention. From this time onward the influence of the pharmaceutical element increased in each succeeding decade, until on the Seventh Decennial Convention there were representatives from fifty-six pharmaceutical associations and colleges of pharmacy, and the Committee was composed of about an equal number of members representing medicine and pharmacy. The result, I think, is most manifest for good on every page of the book. It is evidently a practical book, written by men who have used and tested the formulæ for the various preparations included. At page xxv. of the introductory remarks, the general principles to be followed in revising the Pharmacopœia are admirable, and I think they may well be taken as a guide in the production of our own standard work.

During the American Pharmaceutical Association week and the following we made frequent visits to the World's Columbian Exposition, a description of which I shall not attempt here. Our President, in his capacity of a British Commissioner, had many opportunities of becoming closely acquainted with that gigantic exhibition, and I hope he will, on some early day, give us a full account of it. The second week was devoted to the meeting of the International Congress, and in this arrangement I think our friends on the other side made a mistake. We were almost entirely the same set of men; we had had one week pretty fully occupied with matters pharmaceutical; we were largely attracted by the gigantic exhibition on the shores of Lake Michigan, and we were altogether not under the most favourable conditions for the serious discussion of the long list of subjects set down for the consideration of the Congress. There were some features, however, which were unique to this Congress, and I must not omit to mention them. The first, after settling the preliminaries of business, the election of officers, and so forth, was the presentation of the Hanbury medal to the late Professor Maisch. You all know the professor was too ill to be present, and that the formal presentation was made by our President, and the medal was received by Professor Remington, President of the Congress, on behalf of his dear friend and colleague, Maisch. Gentlemen, I have often been proud of Michael Carteighe, but I never felt more pleased with any man than I was with him in presenting that medal. How his speech has read in hard type I do not know, but, delivered as he gave it, it was inimitable and magnetic in its effect. Professor Remington's reply on behalf of his friend was almost equally felicitous, and was touching in its pathetic allusions. Altogether I rejoice that I had the privilege of being present, and I shall never forget the presentation and reception of the Hanbury medal of 1893.

No meeting of the International Congress would be complete without a reference to an International Pharmacopœia, but our American friends, with the laurels of their own successful book fresh upon them, took a practical and bold step, and carried matters further than had ever been done before, by voting a sum of one thousand dollars to be placed in the hands of a commission, which was to "be employed by this Congress to compile and publish an International Pharmacopœia." The resolution of which this formed the basis was referred to a representative committee, of which I happened to be a member, and after a full and most careful discussion it resulted in a permanent committee of three being appointed, to arrange with the Pharmacopœia Committees of the various countries for the appointment of a commission to compile an International Pharmacopœia of potent remedies. This committee, as you will have already seen, is composed of Professor Remington, Mr. Carteighe, and Anton von Waldheim, and as there seems no more valid reason why such potent substances as tincture of aconite, tincture of opium and others should be of different strengths in the various civilised countries, except that there has been no official body to authorise their uniformity, I hope that something like international agreement in these directions may now be accomplished.

The representatives from the continent of Europe who attended the Congress were few in number, but some continental pharmacists wrote and contributed some good papers on Education, Pharmacopœial Nomenclature, etc., which were duly read and discussed, and the publication of which will be valuable.

On the third day of the Congress, an important discussion took place on the relation of pharmacists to public sanitation, and the subject of the adulteration of food, which was taken part in by several Americans, by Mr. Martindale and Dr. Ramlot. Subsequently a committee was appointed, and the following resolution was unanimously adopted: "That in the judgment of the Congress, the educated pharmacist is the natural and proper expert on measures for public tests, not only in the prevention of adulterations, but in the inspection of water supplies, of sewage, etc. The pharmacist is by virtue of his profession the common chemist of the common people." The last sentence reads well, and was received with applause, but before the "licentiate in pharmacy" of America, or the "registered chemist" of our own country will be able to establish any such claim "by virtue of his profession," he must make a much greater effort to become a chemist in reality as well as in name. With regard to the first half of this resolution, so far as it may have any reference to this country, however natural it may be for pharmacists to be the proper experts in the questions of sanitation and adulteration, the duties are already in the hands of persons who are for the most part not connected with pharmacy.

On the broad question of education for pharmacists, the Congress generally approved a four years' apprenticeship, and an enforced curriculum of study, and it was resolved that every delegate should use his influence to bring this about in his own country. An "enforced curriculum"! We have heard of it since education has been talked about; how long is it to remain in the region of talk?

I think I have now in a very cursory way given you an outline of our work and experiences in Chicago; in the further remarks which I intend to make I shall dwell upon some aspects of education, examination, and legislation as they affect pharmacy in the United States. In this I shall make no comparisons between ourselves and our American cousins, but confine myself to giving you an account of things as they exist on the other side. Great Britain has much to do to set her pharmaceutical house in order, and as there is slowly, but surely, approaching an occasion when necessity will be laid upon me, as President of the Conference, to give another address, I hope to have a straight talk on British pharmacy and pharmacists. In the meantime there is no useful lesson to be learned from the United States. So far as my observation goes, I must record the impression I have formed that these three all-important parts of pharmacy, education, examination, and legislation, are in an entirely chaotic condition in the United States, and that there are two factors, viz., the dollar and politics, which exert such a pernicious influence, and are so powerful, that I fear it will be many years before pharmacy will reach the plane to which many of our friends in America rightly aspire, and to which some of their literature which we meet with in this country would lead us to suppose they had attained.

With regard to education, if advertisements and prospectuses were reliable guides, every State and almost every city is provided with most ample facilities, but if we look beneath the surface and examine closely into the machinery for education, we shall find it differs in value—from the college of pharmacy with a seventy years' record of honoured names and honest work, to the college (*sic*) of just as many months or days, with its self-appointed and denominated professors, who have little to commend them as fit for the posts they occupy, except the possession of an ineffable amount of self-assurance, and a fixed determination to be heard and known for their much speaking. There would appear to be no uniform standard of educational attainment even aimed at by many of these bodies, and although several of them have what they are pleased to call junior and senior courses, we find in some cases the latter are a mere repetition of the former, and that no attempt is made to take the student on to any higher plane of education. Most of the colleges, as the compliment of an attendance upon their prescribed course and a more or less serious examination, confer upon their students the title of "graduate in pharmacy," but so little is this title respected in America, and so slight is the confidence reposed in its meaning anything, that at the meeting of the American Pharmaceutical Association in Chicago, the following report was unanimously adopted in the section on Legislation :—

"Regarding the question of registering of graduates of pharmacy without examination by boards of pharmacy, it is the sense of this section that the best interests of pharmacy are secured by the non-recognition of diplomas by the State boards. That there shall be no difference in the treatment of applicants for registration as pharmacists, whether they be graduates or not."

This means that the title of "graduate of pharmacy" is worth so little, forsooth, or is of such variable and uncertain worth, that even the boards of pharmacy (and I shall tell you presently how they are constituted and how they examine) are advised by a national assembly of pharmacists not to accept the diploma in lieu of their own examinations. I quote the following from a report of a State board of pharmacy :—

"It is to be regretted that some colleges of pharmacy, in anxiety to increase their popularity or to enrich themselves financially, have become somewhat lax in their requirements for graduation," and then follow some further remarks, and a copy of a correspondence with a conference of the teaching colleges of pharmacy of the United States, in which are pointed out specific instances of laxity, such as crude and raw students with as little as fifteen months' practical experience of the drug business, and being under age, having been granted diplomas. The Dean (*sic*) of one college claimed that "every American college is doing the same thing." The pharmaceutical journals admitted the existence of the evil, although some of them "hedged," but it was mentioned as a significant fact that those journals were the organs of the colleges complained of. In this connection it will be interesting to record a question and answer in one of the papers presented to the American Pharmaceutical Association. "How can colleges of pharmacy be placed upon a purely educational basis instead of being conducted for the money they can make ?" "By the drug trade of each section giving annually one fourth the sum now expended, for *association entertainment* and commercial interests, to the establishing of an endowment fund for the nearest college of pharmacy, the income to be devoted to practical instruction."

It will be impossible, within any reasonable space, to present to you a synopsis of the teaching in all the colleges of pharmacy in the States, but, broadly, the opinion I have formed is that there is not anything like sufficient time devoted to laboratory practice in any of the subjects taught. Lectures and review quizzes are provided in abundance, and these are frequently given in the evenings. I have before me the time table of one college, in which there are lectures from 7.30 to 8.30 p.m., from 8.45 to 9.45 p.m., and a review "quiz" from 10 to 10.45 p.m. every night in the week except Saturdays, when there are two lectures and a review a little earlier. It almost takes one's breath away, and one naturally asks—When do the young men have time to think, and to assimilate and digest the substance of so many lectures and "quizzes," in such doses at bedtime ? These lectures, and much of the work in many of the colleges, are arranged for the accommodation of men who are expected to be holding situations in some store or pharmacy, and who are spending the balance of their time (the best of their time, I should say) in the occupation of the proprietors of drug stores, where a miscellaneous business of all kinds is carried on, and whatever legitimate pharmaceutical work there is is merely an adjunct to the soda fountain. One college even advertises the fact that students attending it can obtain situations easily and earn enough for board and lodging. With regard to practical work, we find that one of the colleges—which boasts that "the facilities for laboratory instruction are unexcelled in this or any other country," and has a botanical laboratory, a microscopical laboratory, a chemical laboratory, a pharmaceutical laboratory, and a dispensing laboratory—condenses its practical work into two hours twice a week for twenty-five weeks, during which the students are supposed to be so proficient in these various studies that time is found for lectures on "anatomy, physiology, and the application of medicine to diseases, and the application of trusses to hernia." Amongst "elective subjects" we find lectures on the "origin and location of mankind, the origin of trade, botanical gardens, and medical practice," but in order to induce the student to "elect" to follow these he is assured that "the subject is very interesting, and takes up two lecture hours."

I now come to the question of the examinations by which pharmacy is State-controlled in America, and as the result of which the examined man becomes the possessor of a "certificate of qualification and competency," to either become an assistant, or the possessor of a store on his own account. In almost every State of the Union (if not in all) there is now in existence a Pharmacy Act, by which there is created a "board of pharmacy," among the duties of which is the conduct of the State examinations. These boards of pharmacy usually consist of five men (in some cases there are only three), who are appointed by the Governor of the State for a term of years, and whose duties are only loosely defined, while their powers are as plenary and as absolute as the most despotic monarch could desire. In some States no other qualification is necessary than that the persons are, in the opinion of the Governor, competent to perform the duties; whereas, in other States, it is provided that three out of the five shall be graduates in pharmacy. These boards of pharmacy appoint one of their number as president, and another as secretary, after which they make up various committees. In one board of five members there exists a committee on "complaints and grievances," another on "adulterations and poisons," a third on "auditing and finance," and so on, so that it is no fancy picture that in America the ideal committee of "one" must be frequently reached. I have not desired to look for motives in the selection and appointment of the members of these State boards, but when I tell you that the secretary is appointed for a term of years, that in one State he gets a salary of 2,000 dollars, and an allowance of 600 or 700 dollars more per annum for expenses, I think there is room for the suspicion that political services rendered may be at least as powerful as pharmaceutical fitness, in the selection and appointment of one member of the board.

The board does not meet, as we would suppose, in the capital town or the most important centre of the State, but is peripatetic, and travels (as occasion may require, I suppose) from one centre to another; the consequence is there are no specially fitted rooms or laboratories suitable for the conduct of the practical subjects of dispensing and analysis, so we find these are dispensed with, and the examinations are entirely theoretical and almost entirely written ones. With regard to materia medica no further provision is made than that specimens of drugs, such as one member of the board can obtain by a visit to the chemists' shops in the neighbourhood, just before the examination, appear to be handed to the students for identification and written description. The members of the Board on reaching a town take up their quarters and hold their meeting at some hotel, whilst the examination may be held in a room in another hotel. On reaching the hotel where the examination is to be held the secretary calls the roll of students in attendance, and the president proceeds to make a speech, in which he informs the candidates, for the first time, so far as I can make out (there appear to be no printed rules or regulations to guide either the board or the students), of the subjects and scope of the examination, and warns them against the "clandestine use of books," "whispered consultations," and other unfair means of attaining the coveted registration of the board. In one case which I have recorded, thirty-one candidates answered to the roll call, and then two members of the board examined the candidates in "toxicology, prescriptions, and materia medica," from 2 to 5 p.m. A recess was then called, and at 7 the class reassembled and was examined in chemistry by another member of the board until 9.30 p.m. The next morning at 9 a.m. the candidates reassembled, and were examined in pharmacy until 11.15 by a fourth member of the board. This completed the examination so far as the class was concerned, and a recess was taken by the board until 3 p.m., when the full board met again to "consider the answers to the questions," and as the result fifteen candidates were found to have passed a satisfactory examination before the board of pharmacy, and "on motion, were declared licentiates in pharmacy of the State of———" How long this process of examining the papers of thirty-one candidates in five subjects took is not on the minutes, but as a good deal of other work, including administrative and financial business was done, and no "recess" was called, I infer that the decision upon the papers must have been reached with considerable despatch.

On another occasion, and in another town, the same board met when only three members were present, two of whom (so the minutes record) repaired to the ——— hotel, where seventeen candidates were in waiting. The examination was conducted during the afternoon of one day and part of the morning of the next, and as the result four names were added to the list of "licentiates" of that particular State. You will observe the rejections—over 75 per cent.—are very heavy at this examination, and we may infer from it, probably, that the two members of the board, conscious of their responsibility to examine in five subjects, erred, if at all, on the side of the "safety of the public."

By this board toxicology is one of the subjects included in the examination, and I find among the questions a request for the symptoms of poisoning by aconite and nitrate of silver, subjects which we should relegate to the medical man. In another examination I find "physiology" included amongst the subjects, and such a question set as "Name the largest gland in the human body, and give an account of its functions." It is not necessary for me to add specimens of ridiculous answers to questions, a number of which were included in papers presented to the American Pharmaceutical Association, or to remark that some of the candidates are so ignorant and so little accustomed to handle drugs and medicines that a writer of a paper presented to the Association mentions "the possibility of a candidate for registration in pharmacy being poisoned by the examination of samples submitted," but I would ask our American *confrères*, in all seriousness, if examination by a State-Governor appointed board of pharmacy, in the manner and under the conditions I have sketched, can be accepted as anything better than a parody upon pharmaceutical education and knowledge. It is no answer to say that in this State or in that the Governor has made the wisest possible selection, and has appointed five absolutely wise, learned, and conscientious pharmacists, who are capable men, able and willing to devote the time to the work; the system is entirely wrong, and no examination, in the true sense, can be conducted with uniformity and a becoming dignity by three or five men touring from one town to another, without a fixed suite of rooms properly equipped with apparatus and specimens for the work.

Lastly, I come to legislation, and on this point I have not much to say. One of their own writers states "that the laws we have are crude, inconsistent, and therefore without value." I might leave this section of my notes there, but it will perhaps be more interesting to give you a slight sketch of what their laws are like, and I take a copy of the pharmacy law of one of the States, which was passed in 1889. The Act consists of eleven sections. By the first it was enacted that "No person shall conduct or keep a shop of any kind for retailing drugs and medicines, or for dispensing physicians' prescriptions, except he be registered." So far this seems an ideal Pharmacy Act, and the handling for every purpose of drugs and medicines is confined to the educated and examined pharmacist, but unfortunately the second half of the section gives it nearly all away, as it is expressly stated that "it shall be lawful for any person to sell proprietary medicines, or to be the owner of a shop, if he takes no part in conducting or keeping the same." This last condition is evidently overcome sometimes, as we find an advertisement for "a qualified man to take charge of a shop at a distance, or of one who has a *diploma to let.*"

By the second section a commission of three, to be styled the "Commission of Pharmacy and Practical Chemistry," is to be appointed by the Governor, and to hold office for three years.

Third.—The commission shall hold meetings for examination, etc., at least quarterly, "at such time and place as they may see fit."

Fourth.—They shall examine candidates, and if any one is found skilled and learned in pharmacy they shall give him a "certificate stating that he is a skilled pharmacist and authorised to engage in the business of apothecary and druggist."

You will have observed how under such delightfully vague law as this, men are examined in toxicology, physiology, and many other subjects which we do not connect with pharmacy. There is really nothing to prevent the board from requiring a knowledge of astrology and palmistry if this State-Governor appointed board of three thinks these subjects essential to a candidate who is to be called "learned in pharmacy."

Fifth.—They shall examine applicants over 18 with two years' experience, and register them as assistants.

Sixth.—A registry to be kept.

Seventh.—A record of the doings of the Commission is to be filed with the Secretary of State.

Eighth.—"Applicants for pharmacists' (the fourth clause provides for their being registered as "apothecaries and druggists") certificates are to pay five dollars, and of assistants' two dollars, and each commissioner is to receive five dollars a day for each day of actual service not exceeding fifteen days in the year, and all expenses incurred in the discharge of his duties."

This is evidently a very economical State, and unless there is a good deal of elasticity about the last words of the clause, the State must be blessed with some patriotic men, who will travel a long distance and examine men at two dollars and five dollars a head, on the pittance of five dollars a day and expenses.

Nine.—"All pharmacists lawfully registered are authorised to keep spirituous liquors for compounding their medicines.

In one form or another this is a very important clause. We find in one State one of the reasons for a candidate presenting himself as a candidate for examination is that he may as a registered pharmacist procure a "druggist's licence to sell liquors," at the nominal fee of a dollar.

Ten.—"All persons violating this law shall be punished by a fine not exceeding fifty dollars for each week of the said violation."

Prosecutions appear to be among the duties of the Commission, and quite a number of convictions are obtained and penalties recovered.

Eleven.—"This Act shall not apply to physicians."

In most States men who possess medical degrees can claim to be registered as pharmacists without examination, and many practise as medical men at the same time they keep open shop.

Before I finish you may ask me—But what is the actual condition of the drug trade, wholesale and retail, in the States? With regard to the wholesale and manufacturing trade I will say but little, except to record the impression that there is a great disposition to use the power of money and the services and influence of science and scientific men, in fair and unfair attempts to induce medical men to prescribe and use only X. Y. and Co.'s tincture or extract. The result is that a dispensing chemist has to keep perhaps half a dozen different makers' preparations of a pharmacopœial article. As to the retail trade, so large a proportion of their pharmacies have the appearance of bazaars and refreshment saloons that one is forced to the conclusion that these pharmaceutical adjuncts are really the important sources of the incomes of the proprietors, and we cannot but suppose that pharmacy suffers accordingly. It was with a feeling of intense pleasure that I visited on my last day in New York a retail pharmacy where there was no sign of soda fountain or sundries, and a pure prescription and drug business was done. I think it is due to the proprietor of this pharmacy, who has the courage to conduct a pure drug business, to state his name. It is Mr. Fraser, of Fifth Avenue, and I should like to take this opportunity of thanking him, as well as many others whom I met in America, for much courtesy in giving me information.

In conclusion, although in what I have written I may appear to have blamed more than I have praised, I hope it will be received

> "In spite of all, as brother judging brother."

There are men who have been, and are, connected with pharmacy in America whom I respect as highly as I do some of our own most distinguished pharmacists. Procter, Parrish, Bedford, Markoe, Maisch, Squibb, Remington, and a number of others, have been familiar to me in their writings ever since my own connection with pharmacy, and I am indebted to them for much of the information which I possess and value. Bedford, Squibb, and Remington, I count it a happiness to have known, and to know personally. It is with the sincere desire that the pharmacists of the great American nation may be worthy of such men that I have written candidly upon what I have observed, which is hindering, and will hinder, the progress of pharmacy in that country.

[*The discussion on this paper is printed on page* 489].

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, DECEMBER 16, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## ACCIDENTAL POISONING.

THE two fatal cases of poisoning, recently caused by mistakes in the administration of medicine, have been very generally commented upon in the newspapers, either editorially or in letters, and various suggestions have been made as to means of preventing such accidents. In several instances surprise is expressed that bottles of well-marked and unmistakable difference from those in ordinary use are not employed for medicines of such a potent nature as to involve danger of poisoning if they are not administered with proper care. A physician suggests that in addition to the use of coloured or fluted bottles, all medicines of a dangerous nature should be kept in a cupboard under lock and key, and he urges that medical men should insist upon such precautions being observed. Another physician expresses the opinion that such medicines should be supplied in the old fashioned form of draughts. This would no doubt be an effectual way of obviating the danger attending the pouring out of doses of medicine, especially when they are of the concentrated kind now too often used. But no one appears to have sufficiently recognised the fact that the surest safeguard against accident or mistake is the punctilious reading of the label on a bottle of medicine before pouring out a dose. That should be an invariable practice, and it is one which would always be effectual as a safeguard. The coloured or fluted bottle which has been recommended for liniments and other preparations for external use is far less to be trusted, and not long ago a case occurred in which the fluted poison bottle failed to prevent a fatal mistake in the administration of a wrong medicine.

It is a matter of especial importance to chemists—as persons legally authorised to supply poisons, either as medicine or otherwise—that the possibility of mistakes of the kind now referred to should be reduced to the narrowest possible limits, and that the provisions of the Pharmacy Act in regard to poisons should not only be scrupulously observed by them, but that the spirit of those provisions should be still further applied by them in practice. A more general endeavour in that direction would conduce to the prevention of accidents and at the same time tend to convince the public that the properly qualified chemist is the proper person to be trusted with the preparation and supply of medicine. It is with regret, therefore, that we notice a communication from a "country chemist" in the *Daily News*, which is rather calculated to throw ridicule upon the Pharmacy Act than otherwise. A comparison is made between the sale of syrup of chloral in the ordinary course of business and the supply of the same preparation ordered in a physician's prescription, and it is then stated that from the necessity of using the "poison" label in the one case but not in the other, it may be inferred that "syrup of chloral is 'poison' if you buy it direct from your chemist, but not poison if your doctor orders it." This is a misrepresentation of the Act which almost deserves to be called perverse. It overlooks the fact that, in regard to labelling, the Act deals only with the sale of poisons, and the equally important fact that the exemption of medicines prescribed by medical men rests upon the same basis as the restriction of the sale and dispensing of poisons to qualified chemists. The medical practitioner's medicine is outside the operation of the Act because of his proved competence to direct its use for the treatment of disease, and the medicine dispensed by the chemist according to those directions is outside the Act because of the proved competence of the chemist to prepare it and to provide for its being properly administered. It is unfortunate that such an important distinction should be overlooked, and that a mistaken reading of the Act should have given rise to adverse comments in the lay press.

A similar mistake is frequently made in regard to the meaning of the word poison in the Pharmacy Act, and by neglecting to consider the special application the term has in the Act it has been contended that a quantity of a scheduled article too small to kill is not a poison. This is a sort of argument akin to that by which a horse chesnut is made out to be the same as a chesnut horse, and it has no rational relation to the fact that by the definition of a poison in the Pharmacy Act any article included in the Schedule is technically, for the purposes of the Act, a poison. That would be the case if the article were not poisonous—a character which is determined not by being included in the Schedule, but by circumstances of quantity, etc., which are not taken cognisance of in the Act at all. Bearing in mind, therefore, the specially limited application of the word "poison" in the Pharmacy Act, it follows that an article in the Schedule is, for the purposes of the Act, a poison, however small the quantity of it may be. Anything short of that view of the matter would have the effect of minimising the value of the Act as a measure to provide for public safety, and would open the way to evasions which might, in some instances, be harmless, but would render the whole operation of the Act uncertain.

## ROYAL COLLEGE OF PHYSICIANS.

At a meeting of the College on Thursday, December 7, Dr. J. Russell Reynolds, F.R.S., was elected President in the place of the late Sir Andrew Clark. According to the *Times*, Dr. Reynolds became a member of the Royal College of Surgeons in 1850; took his M.D. Lond. degree in 1852; became a Member of the Royal College of Physicians in 1854, and a Fellow in 1859. He is a member of various learned societies, British and foreign; Physician in Ordinary to Her Majesty's Household; and connected with University College, St. George's, and Westminster Hospitals, besides being physician to the National Hospital for Paralysis and Epilepsy.

## THE METRIC SYSTEM IN RUSSIA.

It is announced that, on January 13 next, being the beginning of the year according to the old style calendar, the chemists in Russia will begin, by order of the Tsar, to use decimal weights and measures.

## EDINBURGH PHARMACY STUDENTS' SUPPER.

The sixth annual supper was held at the Grand Restaurant on Friday, December 8, when the chair was taken by Mr. William Duncan, who was supported by Messrs. J. Laidlaw Ewing (Chairman of the Executive of the North British Branch), J. B. Stephenson, Peter Boa, and J. Rutherford Hill. There was an attendance of about sixty. The toast of the Pharmaceutical Society was responded to by Mr. Laidlaw Ewing, who referred to the present prosperous condition of the Society in Scotland, and urged the young men present to maintain their interest in its work. Other toasts were "The Board of Examiners," acknowledged by Mr. Stephenson; "The Pharmacy Students," and "The Ladies." The addition of vocal and instrumental music, recitations, and a display of conjuring feats by Mr. L. V. Jacques, rendered the meeting a very pleasant one.

## PHARMACEUTICAL FOOTBALL CLUB.

The second annual smoking concert in connection with this club was held at the Freemasons' Tavern on Tuesday evening last, when the chair was taken by Mr. M. Carteighe, President of the Pharmaceutical Society, who was supported by Mr. Alexander Bottle, of Dover, Mr. E. N. Butt, Mr. Richard Bremridge, Professor Greenish, and other visitors. A long and pleasantly varied programme was gone through in a successful manner, the different items being rendered very efficiently, and Messrs. E. J. Eastes, A. W. Wolstenholme, and H. Jenner acting as accompanists.

## THE "COMPETITION" DIFFICULTY IN CANADA.

According to the *Canadian Pharmaceutical Journal* the drug trade in Toronto, Ontario, is in an "utterly wretched condition." The result of extensive inquiries in the city "shows a most deplorable state of things, with absolute hopelessness as to the future. The volume of business has contracted to such limits, that difficulty is realised in even paying expenses; while the prices of some classes of goods are so low as to preclude all ideas of profit. Even in the dispensing department, in which some return for skill and labour might be expected, the receipts have to be shared with the prescriber, or the trade has to be sacrificed." The causes which have brought about this condition of affairs are stated to have been partly beyond the control of the druggists, but in great measure brought about by themselves, in the voluntary relinquishment or neglect of certain branches of trade. Growing competition, however, appears to have been the main factor, and this, it is pointed out, can only be met by business methods. In certain branches of his business "the druggist is no more than a tradesman, and he must do as other tradesmen do. . . . People must remember that, during the past twenty-five years, business methods have been almost altogether revolutionised. At that time the family druggist was a recognised institution, and people seldom wandered from those in whom they had confidence. The family druggist purchased, in return, the greater part of his wares from one wholesale druggist. Prices were not closely scrutinised and seldom needed it. This happy and contented state of things no longer exists. The public is possessed with a rage for cheap goods, and people will put themselves out of the way to secure bargains." It is pointed out that the same conditions obtain in the druggist's dealings with the wholesale trade: druggists do not complain on account of having low prices thrust upon them any more than retail purchasers do. Though pharmacy in this country is certainly far from being at such a low ebb as it is, according to our contemporary, in Ontario, a statement of the facts given above may serve a useful purpose as indicating probable results if business necessities be persistently overlooked. Business aptitude is as essential to the loftiest professional career as in the lowliest trades, and the chemist and druggist who refuses to perform all his duties in a business-like manner cannot look for ultimate success, whilst the more business-like he is the greater that success is bound to be. Several of the evils referred to, moreover, exist to a limited extent on this side the Atlantic, and in order to extirpate them, and so effectually hinder their further development, personal improvement from an educational point of view and increased self-respect must be superadded to association and sympathy with fellow-craftsmen.

## INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

In connection with this congress, to be held at Budapest next year, it is proposed to consider, as part of the proceedings of Section XIX.—Pharmacy, the systems under which druggists' shops are licensed, established, and controlled in different countries.

# Transactions of the Pharmaceutical Society.

## BENEVOLENT FUND GENERAL MEETING.

### ELECTION OF ANNUITANTS.

A General Meeting of the Members and Associates of the Pharmaceutical Society and Donors to the Benevolent Fund was held at the house of the Society, 17, Bloomsbury Square, on Tuesday, December 12, at 12 o'clock, for the election of Four Annuitants.

Mr. Michael Carteighe, President, in the chair.

The notice convening the meeting was read by the Secretary.

Scrutineers were appointed, who examined the voting papers.

On bringing up the report the Chairman said the Scrutineers who were duly appointed at the meeting for the election of four annuitants on the Benevolent Fund of the Pharmaceutical Society had examined all the voting papers which had been placed before them, and had unanimously agreed to submit the following report:—

*Scrutineers' Report.*

We, the undersigned Scrutineers, appointed at the twenty-ninth election of Annuitants on the Benevolent Fund of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following result:—

| | |
|---|---|
| Baker, William S. | 7617 |
| Bromfield, Charles | 1940 |
| Ellis, Elizabeth | 1563 |
| Haworth, James King | 3256 |
| Kent, Alfred | 3129 |
| Kershaw, Ellen | 2397 |
| Watson, James B. | 2503 |
| Wavell, Mary A. | 2797 |

3532* voting papers were received, of which number 90 were informal (59 unsigned and 31 incorrectly filled up), representing a total of 278 invalid votes, and were disallowed.

Edward N. Butt, *Chairman.*

Percy J. Robbins.
John Holding.
George Wylde.
Wm. Harvey.
Albert Pellew.
John T. Wallis.
W. Toogood Frost.
Charles J. Miles.
W. Murton Holmes.
Wm. Arkinstall.
H. H. Millhouse.

Alfred Williams.
Henry C. Birch.
Thos. Henry Powell.
Edwd. B. Stamp.
R. Fisher Young.
Edmund White.
John Humphrey.
Alexr. Bottle.
R. S. Dampney.
C. E. Turner.
J. H. Shacklock.

*December* 12, 1893.

The President then declared the following duly elected Annuitants:—

**Baker, William S.**
**Haworth, James King.**
**Kent, Alfred.**
**Wavell, Mary A.**

The President moved a vote of thanks to the Scrutineers for their services, which was duly carried, and suitably acknowledged by the Chairman—Mr. E. N. Butt.

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* 6874 voting papers issued.

## EVENING MEETING IN LONDON.

*Wednesday, December* 13.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The second evening meeting of the session was held on Wednesday evening, the chair being taken by the President, at 8 o'clock.

The President, in calling upon Mr. N. H. Martin to read a paper upon the recent international pharmaceutical meetings in Chicago, said that it would be recollected that Mr. Martin and Mr. Martindale were appointed with him (the President) as delegates to the meeting of the Chicago Congress. That meeting would be historical through a distinguished honour having been conferred by the Pharmaceutical Society of Great Britain upon an American pharmaceutist, the presentation of the Hanbury Medal having been made to Professor Maisch shortly before he died.

A paper was then read by Mr. N. H. Martin, F.L.S., F.R.M.S., President of the British Pharmaceutical Conference, on—

The Pharmaceutical Meetings at Chicago in 1893, with Some Notes on American Pharmacy,

which is printed at page 481.

Mr. Martindale, speaking at the invitation of the President, said that he had come to listen rather than to speak, as he had had the honour on another occasion and in another place to give some account of his short visit to America. In many respects he agreed with Mr. Martin's paper, but there were some points as to which he should be critical. He thought that railway travelling in America was not as bad as Mr. Martin had represented, and some of the scenery on the railroads was the best to be met with anywhere. He agreed with Mr. Martin with regard to the discussions which took place at the American Pharmaceutical Association, and especially with regard to the discussion on commercial interests. That debate was carried on from 7 till 11, and very little in the way of conclusion was arrived at. He was inclined to describe the Congress as a pan-Anglican rather than an International one, as there were only one or two persons present who were not English-speaking people. With regard to an enforced curriculum, of which Mr. Martin had spoken, the great difficulty of the system of training was the want of apprenticeship. In many cases the young men entered the drug stores in little better condition than that of mere errand boys. After two or three years they were, perhaps, promoted to the position of clerks, and if they showed the adaptability and sharpness which most American youths possessed, they stepped forward and wished to enter the drug trade and to pass the examinations. In doing this they managed to get through a kind of curriculum, but one which was in no sense worthy of the name. While they were in attendance at the colleges of pharmacy they were obliged to be employed during the whole day in some drug store. They took their course of instruction in the evening. The instruction in chemistry mostly consisted in all the members of the class, each at his own individual desk, following the professor through various experiments. There was no system of laboratory instruction in chemistry worthy of the name. The greatest part of the instruction seemed to be in the direction of practical pharmacy. In two or three colleges he had seen the appliances and apparatus for conducting and explaining the processes of pharmacy, and they were most elaborate, and would give the pupils who attended the instruction a very good idea of pharmaceutical processes and practical pharmacy. He thought that the students were taught pharmacy fairly well. The teachers left out botany for the most part, as they regarded that subject as very unprofitable. A little materia medica and a little chemistry were taught. A point which they were very strict upon, and dealt with in the discussions, both of the American Pharmaceutical Association and the International Congress, was the subject of adulteration. Many of the teachers at the different colleges were men who were appointed by the governors of the various states as the public analysts. It appeared to him that the Adulteration Acts were carried out very efficiently and very fairly. The analysts seemed to judge very fairly between what were evidently adulterations and what were mere accidental impurities. He was highly amused at the mode in which the election of examining boards was carried on in some of the states. A few weeks before the election a postcard was sent to every pharmacist, for him to write upon it the names of men whom he would recommend as members of the examining boards, and the postcard with the selections upon it was sent to the governor of the State. One great difficulty in the United States with regard to the examinations was that each state was independent of all the others. It seemed to be a great desideratum in this matter that the States should centralise, and have their boards constituted by the central government of the country. The various competing boards and competing schools seemed to be outbidding one another as to which should teach the most subjects and give the most certificates. As far as he could ascertain, some of the states allowed the holders of certificates from adjoining states to practice in them and others would not. With regard to the wholesale trade, he went over an immense store in Chicago. The number of special preparations which they held in stock was marvellous. He had no conception that such a number of nostrums, gathered from the ends of the earth, could be brought together. The wholesale stores which he visited had a fair stock of drugs, both in their crude condition and in their various states of manufacture. Two or three of the large houses in the city of New York had immense stores of pure drugs, with very little of that admixture of nostrums which he found in the large store in Chicago to which he had alluded.

Mr. **Umney** said that the meeting would be very glad to hear the other member of the trio of delegates. It was evident that there were pharmacists in America who knew their business, or they would not have been able to produce that marvellous production which had lately been put into the hands of English pharmacists, the new United States Pharmacopœia. That was a work of which Americans were very justly proud.

Mr. **Lomas** said that he quite agreed with that portion of Mr. Martin's paper which said that the chemists' shops in America had the appearance of refreshment bars. Most of their business seemed to be the sale of effervescing drinks. This was the case in San Francisco and several large towns. As to the railways, he preferred the English railways to the American. In England if a passenger paid first-class he got first-class. In America the passenger might pay first-class and go into the first-class carriages, but those carriages would be invaded by third-class passengers. The passengers who used the dining cars were told that they would be supplied with such fruit as was in season. In his case the "fruit in season" consisted of a single orange. There were many inconveniences on the American railways. The trains did not travel; they just crawled along. If a traveller had a long purse, the Americans would take advantage of that fact. He had had a first-class ticket taken out of his travelling cap, where he had placed it, and a third-class ticket substituted for it.

Mr. **Hills** said that he thought the Society was indebted to Mr. Martin for his admirable paper. The author had touched upon many points which might lead to very useful discussion. The paper had recorded the state of education and examination in what might, perhaps, be regarded as the latest addition to the civilised countries of the world. It appeared to him (Mr. Hills) that England held a somewhat intermediate position in regard to education, between the continental countries of Europe and the American continent. He hoped that any changes which England might make in the system of education and examination would tend rather towards the methods adopted in Germany and France, and other nations of Europe, than to those which had been admirably described in the paper as existing in America.

Mr. **Fitch** said that he had spent a considerable time in the United States, which he left about twenty-eight years ago. His conviction was that pharmacy must have advanced materially during the last thirty years, as the crudest pharmacy existed in the small country towns when he was in the States. A man who knew nothing about the subject could take a drug store. At a town in Virginia, on the Ohio River, he was amused to see gin put up as a specific for urinary complaints. In the large stores in the cities they seemed to deal principally in aerated waters, but it was not so in the outlying towns. No diploma was required, and a man could practice as a doctor or a pharmacist without let or hindrance. He (Mr. Fitch) could not quite understand the statement in the paper about the trains. Perhaps they had altered since he left America. The last cars in the trains were then used for ladies, and if a gentleman travelled with a lady he could ride with her in the ladies' cars. Dickens gave an unfavourable account of the accommodation on the trains, but Dickens did not travel with a lady. The rest of the train was third class. Pharmacy in America was conducted on a very rough and ready system twenty-eight years ago, compared with the state of things which Mr. Martin had met with. Great advances had been made during the interval, and if American pharmacy progressed at the same rate during the next twenty-eight years, it would come into line with the pharmacy of this country.

Mr. **Butt** said that the extent of his pharmaceutical experiences in America was that he had seen a little pharmacy in Brooklyn, and he had gone over Squibb's laboratory. He observed at one of the chemists' shops in the west that five customers went in in succession, and that they all suffered from the same complaint, and had the same kind of draught—whisky.

Mr. **McEwan** said that he had heard, by correspondence and otherwise, that if it had not been for the delegation sent by this Society to Chicago, the International Pharmaceutical Congress would not have been much of a success. It was right that the Society should acknowledge the services of the delegates in this respect. Mr. Martin's description of the colleges of pharmacy in the United States was accurate, but there were unquestionably some three or four colleges which were striving to put pharmaceutical education on a thoroughly high platform. There were some highly clever pharmacists in the United States. The United States Pharmacopœia was an evidence of that fact. Many of those men were connected with educational establishments. In some of these places, especially the colleges which were connected with the Universities, they were endeavouring to have a sound curriculum—a curriculum in the daylight, and not one under lamplight. It was one of the great drawbacks to the oldest Anglo-Saxon college of pharmacy in the world that its education was administered to the students at night, after they had done a hard day's work. It was a matter of regret to the teachers in America that they could not alter that. He believed that, in the course of time, when the western and central states developed and became more consolidated in matters of business, they would be able to turn their attention to education, and the new form of education would be ahead of anything which could be adopted in England, where there were old institutions to be got rid of. Unfortunately it was true that there was much that was extremely regrettable about the practice of pharmacy in the United States. This was to be attributed to a large extent to the fact that America was a young country. The pharmacy which Mr. Martin had referred to was the Bell's, of New York, and it might be almost called a typical English pharmacy. There was a tendency now to get rid of the soda-water fountain. One pharmacist had got away from that sort of business by going up to the eleventh story. There were many others like him. They were beginning to see that, in order to keep up the tone of the profession, they must get rid of the purely bazaar element to which Mr. Martin had referred. Mr. Martin had done the Society service and done American pharmacy a service by reading the paper. He impressed all that he met in the United States as being a man who said what he meant, and no doubt the dose which he had given the American pharmacists was a dose which they required, and one which they would receive from his hands while they would not receive it from one among themselves.

Mr. **Collier** asked whether Mr. Martin could give any information regarding hospital pharmacy, and the arrangements for teaching pharmacy to medical students in the United States?

Mr. **Martindale** said that with regard to the hospitals, a curious system prevailed in New York. Mr. Charles Rice, of the Belle Vue Hospital, New York, had control over the whole supply of drugs to the different hospitals in New York. He was a very first-class man, and acted as a sort of buyer and investigator on behalf of the hospitals. He tested and checked the drugs, and had a great deal of account keeping with regard to them.

The **President** said that, in considering Mr. Martin's paper, they ought to remember that pharmacists on this side of the Atlantic had been for many years under the impression that a very large number of their American brethren were up to the standard of some of the historical American pharmacists whom English pharmacists had known or read of. Perhaps Mr. Martin and Mr. Martindale were a little bit prejudiced at first by finding that every pharmacist in the States was not a Parrish, or a Remington, or a Procter. In rushing straight through to Chicago, in the first instance, without stopping on the way, he (the President) very soon began to feel the influence of western training, of western air, and of western civilisation. Of course it soon dawned upon the delegates that America was a conglomeration of states. On the one hand there was a state which would correspond with Glasgow, and on the other hand there would be one which would correspond to Belgravia. There was a state corresponding to the eastern coast of England, and there was one almost corresponding to Skye in some respects. Then they were soon confronted with the fact that the newest states had hardly had time to get their cities in order. Pharmacy would be one of the last things that any state would attend to. He did not think that Mr. Martin wished to imply in his paper that he expected to find in every state of the Union the typical pharmacist, such as might be found in Philadelphia, Boston, New York, or Baltimore. What surprised Mr. Martin was that among an eminently practical people like the Americans the process of preparing men for pharmaceutical work was so defective. In this respect he (the President) agreed with Mr. Martin. This state of things seemed to him to be so unlike what one would expect of an American. Professional propriety in America was very much affected by the dollar, and he did not wonder at it. If there was anything of which he could speak with unbounded admiration in the States, it was the fact that everybody worked, and that everybody who worked was respected. The pharmacist who worked was respected, the lawyer who worked was respected, and the judge who worked was respected; and the judge, and the lawyer, and the pharmacist possessed mutual respect for each other. The defect in the training of the pharmacist in the United States was graphically described in the paper. It was that whilst there was an attempt at training, the time allowed for it was too small, and for all practical purposes there was no training at all in many places. Even at the old college, which was founded by and associated with the successors of the Pilgrim Fathers, there was no opportunity allowed for acquiring pharmaceutical knowledge, and he was bound to say that this fact was not to the credit of the college. The man who was going to be a pharmacist was deprived of the opportunity of being trained. An outsider about eighteen or nineteen years of age, who formed the idea that the sale of pharmaceutical preparations might be a useful sphere of trade, would proceed to a college of pharmacy and there become master of pharmaceutical processes. He would understand the way in which apparatus was used, and he would learn pharmacy without a particle of knowledge of the elements of chemistry or mechanics, on which the whole thing was based. He learned by rule of thumb, but he acquired the practical way of making pharmaceutical preparations. At the end of this kind of training, having no fear of any examination whatever, he would associate himself with a man of capital, and when he had had two years, or even less, of work of this kind, he would become a manufacturer of pharmaceutical preparations, although not himself a qualified pharmacist. He had not had an opportunity of acquiring experience, although he might have got a certificate and licence from an examining body. This was the effect of the process of examination which existed in the various States, and he (the President) agreed very largely with Mr. Martin that English pharmacists had no reason to be alarmed on their own account at what they saw in the United States, and that they might feel a little touch of pride that, notwithstanding their antiquated notions of things, they had come much more nearly to the idea of a typical pharmacist than their American brethren in the eastern states of the Union. The fact that the Americans could allow an outsider to come in, in the way which had been described, and become a registered pharmacist was one of those things "which no fellow could understand." The result was one more confirmation of the old sermon, which he had often had to preach from the presidential chair, which was, that if a man was well trained, whatever examination he passed, he would get more money out of his knowledge than a man who had passed the best examination without having had the training. He was sure that Mr. Martin's criticisms would be of value to their American friends. It happened that the delegates were called upon at the Congress to speak on the subject of education, and it chanced that he (the President) had to speak on the subject of education in England and of education in the United States, as far as he then knew it. At that time he had only been a week in Chicago, and knew very little of the latter, but it appeared that what he said was regarded by the Americans as of great value. They felt that he had no particular prejudices. He did not represent either an eastern state or a western state, and he had no private reason for recommending one form of education more than another. He appeared to have hit upon certain blots in their system, without knowing at the time he was speaking that those blot existed. The primary defect was that there was no such thing as training, and he was afraid that, speaking broadly, there was no sympathy between the keeper of the drug store and the clerks who worked for him and were aiming at becoming pharmacists themselves. What the keeper of the store aimed at was to get as many dollars as possible out of his clerks' work during the twenty-four hours, and he did not consider that it was part of his duty to remember that the clerks would one day be keepers of drug stores themselves. Of course in new states it was not to be wondered at that such a state of things existed. Even in the eastern states, where there was a truly professional feeling, there was no opportunity for proper training, with the exception of the three or four colleges, some of which, as Mr. McEwan had said, were associated with the universities. In some of these colleges the curriculum was perfect, and the colleges had made themselves practically independent of the state boards. In a sense, that independence was an advantage, but in another respect it was a disadvantage. Young men of seventeen or eighteen could come to the colleges to acquire pharmaceutical knowledge without having had any experience in a store, and in two or three years they could get the qualification of graduates in pharmacy. He (the President) was bound to say that amongst the advanced educational members of the pharmaceutical body, and among the teachers, there was a strong difference of opinion as to whether a man who had graduated at a college, without having had a practical training, was not, on the whole, more valuable than a man who had got the average training in a drug store and then went to the college. This was an indication of the minute amount of real pharmaceutical knowledge which an average lad got in a pharmacy store in the ordinary way. The question of the constitution of the state board was one which very materially affected the arrangements with regard to pharmacy in the United States. The boards were appointed under conditions which were characteristic of the laws of those states. In many respects independent self-government among the states worked extremely well. But the examining boards in different states were not in touch with one another. He believed that the American Pharmaceutical Association was a body which ought to assist the governors of the different states with regard to the composition of their boards of examiners. Those who knew his (the President's) views were aware that he thought that no board of examiners was complete unless it included the representatives of those persons who had to teach. As men got older they learned how difficult it was to realise how much knowledge was to be expected of a young man of twenty-one, who had even had a definite curriculum or schedule of studies put before him. Only those persons who had been associated with him daily in the teaching could be said to be quite *en rapport* with him, and quite competent to ascertain whether he had what might be called a fair elementary knowledge of chemistry and botany. The Americans felt this very much. The examiners who were appointed by the governors were very often very worthy and respectable people, but the respect with which they were regarded was very often proportional to their age. He would leave the meeting to judge of the effect of this state of things upon the boards of examiners. The means by which they gauged the knowledge of the men who were examined was absolutely incomplete. The boards had no curriculum and no evidence of practical laboratory work put before them, and in the way in which the examinations were conducted it was impossible to secure a thorough examination. The paper had described the way in which the examinations were conducted. The Americans had, in fact, long recognised that the time had gone by when competence in pharmacy and safety to the public should depend upon an elderly gentleman putting a few questions to the student. The public now required that the pharmacist should be a trained and educated man, and that fact was recognised in the efforts which were being made; but he was sorry to have to agree with Mr. Martin in the statement that the efforts were not as successful as American pharmacists desired them to be. At the same time, American pharmacists persisted in the right direction, in spite of many difficulties. Englishmen would realise the situation if they could only understand how "the almighty dollar" prevailed at every turn. An American drug store was a place where one could always find somebody about, day and night. It was the call-station of the telephone. The American pharmacists deserved some encouragement under their difficulties. No examination such as they had was competent, *per se*, to produce even a tolerable pharmacist, but he did not mean to say that there were no competent pharmacists in the States. In this country, before the time of examinations, we had brilliant pharmacists, the like of whom we might never see again.

Mr. MARTIN, in replying, said that a paper which dealt with such a wide subject as his had done must necessarily have conspicuous omissions. He could have amplified his paper easily, by adducing evidence of the facts which he had had to state so boldly. Though he agreed in the main with the additions which Mr. Martindale had made, as to the election of the examining board of the state, the Act of Congress showed distinctly that the members should be appointed by the Governor of the state. Like all other appointments in the United States, from the Postmaster to the President, the appointments were generally given as a reward for political services. It was a sad revelation to him in Pennsylvania that the College of Pharmacy in Philadelphia had no part or lot in the examinations at all. But the professors of the college told him that the five state examiners were very good men. He thanked Mr. Umney for emphasising the fact that there were good pharmacists in America. That was a fact which the paper had not omitted. Mr. Fitch's experiences of America were very interesting; but the conditions of railroad travelling had changed during the last twenty-five years. Mr. McEwan had contributed very valuable observations to the discussion. He (the author) gladly acknowledged that there were two or three colleges where extremely good work was done, but the institutions where there was a curriculum for day work, and where there was really practical instruction spread over sixty hours a week, were not favoured by the public sentiment of the pharmacists. That was very significant. Many of the colleges tried to outbid one another in offering the most subjects for the money. This method was undignified, and it failed to give the proper education. The College of Pharmacy in Philadelphia had three lecture rooms capable of accommodating about 370 students each, while the practical laboratory would scarcely accommodate 200. From this, one could imagine the proportion in which talking stood in comparison with practical work. He inspected Professor Maisch's arrangements for teaching and demonstration, and found them most complete. Professor Remington also had a pharmaceutical laboratory, which was thoroughly equipped. This, Mr. Martindale had referred to. His paper was intended to show the way in which pharmaceutical education and examination were controlled by the State. It did not allude to the question of whether a man might become a good pharmacist or an educated man. There was no preliminary examination, and a young man would be examined by the state board after having been a nominal student for three or four years.

The PRESIDENT proposed a vote of thanks to Mr

Martin for his extremely valuable paper. The paper represented what they always desired that a paper should represent, namely, the individual views of the writer. He was quite certain that their American friends, who were advanced in educational matters, and who had come in contact with English pharmacists, would welcome the paper and the discussion which had followed it as levers by which they might move forward. In the Pharmaceutical Association of America, which represented all the states, there was very little discussion with regard to the pharmacy laws. It was desirable that the different states should be in touch with one another with regard to the system of their examinations. He (the President) would gladly go to America to-morrow if he could forward that object. He did not mean that the standard by which men could obtain their diplomas should be the same in the oldest state as in the newest. The Americans believe in congresses and in federal representation in the widest sense, and he could not understand why they had not moved in the direction of uniformity with regard to examinations, unless the reason was that each state was somewhat jealous or somewhat frightened of the other. English pharmacists who were outside that state of things could not help feeling that some arrangement between the boards of examiners in the various states was called for, and ought to be urgently pushed forward by the American Pharmaceutical Association in the interests of the progress of pharmacy. He had met with some ladies who were engaged in pharmacy in America, and he was bound to say that, like the ladies in every walk of American life, they showed themselves to be far superior to the boys. He did not say this to the discredit of the boys, but he said it regretfully on account of the fact that, while the boys were put to work as early as possible, that they might earn dollars for the family, the means of the parents were expended on the daughters, and the young ladies were kept at school and educated further and further, until the point came that they were able to "lick creation."

The vote of thanks having been unanimously accorded,

Mr. MARTIN thanked the meeting for the cordial way in which it had been received. He could endorse what the President had said about the American ladies. With regard to the statements which he had made in his paper, he had not the least fear that his American friends would be in the smallest degree annoyed at what he had written.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 13th inst., the Librarian presented the following report of donations to the Society's Libraries:—

*To the Library in London.*

**School of Pharmacy Students' Association:**
Papers read, 1892-93, vol. 18.
**Chemists' Assistants' Association:**
Proceedings, 1892-93, no. 9, 2 copies.
**British Pharmaceutical Conference:**
Year-Book of Pharmacy, 1893, 2 copies.
**Mr. John Gower, publisher, Ealing:**
Stirling's Table of organic materia medica, 2nd ed.
**University College, Nottingham:**
Calendar, 1893-94.
**Geological Survey of Canada:**
Catalogue of a stratigraphical collection of Canadian rocks, 1893.
**Professor P. C. Plugge, University of Groningen:**
Untersuchung einiger niederländisch-ostindischen Pflanzenstoffe.
**Farmaceutiska Föreningen, Stockholm:**
Carl Wilhelm Scheele, ett minnesblad, 1892.

*To the Library in Edinburgh.*

**Mr. J. Laidlaw Ewing, 52, North Bridge, Edinburgh:**
Year-Book of Pharmacy, 1891, 1892, 1893.
**British Pharmaceutical Conference:**
Year-Book of Pharmacy, 1893.
**Mr. J. Gower, publisher, Ealing:**
Stirling's Table of organic materia medica, 2nd ed.

# Proceedings of Societies in London.

## BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 16, Bloomsbury Square, on Wednesday, December 6, at 4.30 p.m. Present:—Mr. N. H. Martin (President), in the chair; Messrs. Atkins, Carteighe, and Martindale (Vice-Presidents), Mr. John Moss (Treasurer), Messrs. Gerrard and Farr, Messrs. Naylor and Ransom (Hon. Gen. Secs.), and Mr. J. C. Nightingale (Assistant-Secretary).

The minutes of the previous meeting were read and confirmed.

The President took this, the first, opportunity of thanking the Committee for submitting him for election to the Presidency at the last general meeting, and promised to do all in his power to promote the interests of the Conference.

Mr. Atkins referred to the loss that had been sustained in the death of Mr. R. H. Davies, Vice-President and formerly Treasurer of the Conference, and moved that the secretaries be requested to send a letter of condolence to Mrs. Davies in her bereavement. The motion was seconded by Mr. Carteighe, supported by Mr. Moss, and carried unanimously.

Reference was also made to the death of Professor Maisch, of Philadelphia, an honorary member of the Conference, and on the motion of Mr. Carteighe, seconded by the President, it was resolved to send a letter of condolence to Mrs. Maisch.

A letter was read from Mr. H. Matthews, the Hon. Local Secretary, suggesting the middle of July as a convenient time for the meeting of the Conference in Oxford in 1894. Considerable discussion ensued, and it was finally decided that July 31 was the earliest date that the Committee could recommend for the commencement of the sittings of the Conference.

By a unanimous vote, Mr. J. H. Matthews was elected a Vice-President in the place of Mr. Davies, deceased.

An application from the editor of the *British and Colonial Druggist* to receive a copy of the 'Year-Book of Pharmacy' annually in exchange for his journal was agreed to.

It was also resolved to elect the following gentlemen as honorary members of the Conference:—

Joseph P. Remington, Ph.M., F.C.S., Professor of Theory and Practice of Pharmacy in the Philadelphia College of Pharmacy, First Vice-Chairman of the Committee of Revision and Publication of the Pharmacopœia of the United States of America.

Herr Dr. Anton von Waldheim, President of the Gremium of Pharmacists of Vienna, Vice-President of the Austrian Pharmaceutical Society, Chairman of the International Pharmacopœia Commission of Vienna.

Several gentlemen, having been duly nominated, were elected to membership.

# Provincial Transactions.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The third meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York

Place, on Wednesday, 6th inst., at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, the following papers were read:—

### ANIMAL EXTRACTS.

BY J. W. SIMPSON.

The author gave an interesting *résumé* of the work already done on the various glandular and other animal extracts, recently introduced as articles of the materia medica. He sketched the history of the new method of treatment, beginning with the lectures of Dr. Brown-Séquard in 1869, showing that all glands with or without excretory ducts give to the blood secretions which are of great importance if not absolutely essential, and illustrating his point by reference to the kidneys, suprarenal capsules, and sexual glands. This was confirmed in 1875, and subsequently Dr. Horsley showed that the transplantation of the thyroid gland of animals to the human subject is followed by improvement. This suggested to Dr. Murray, of Newcastle, the idea of using a fluid extract of thyroid gland in cases of myxœdema, and the success achieved by this means had brought the whole subject prominently before the medical profession. He then showed specimens of fluid extracts of pancreas, brain, spleen, pituitary body, sexual glands, and thyroid gland, and also specimens of the various glands, etc., from which they were prepared, and explained the methods of preparation.

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The next paper was on

### THE DOCTOR'S SHOP.

BY JAMES MCBAIN.

The author strongly condemned the practice of doctors keeping open shop, and said it was a great mistake for any youth to go to such a place in the hope that he would learn his business. He quoted several instances of the rough and ready kind of dispensing that usually prevails in such places, and attributed the presence in the ranks of pharmacy of a number of badly-trained and inferior men to the fact that, after serving a so-called apprenticeship in a doctor's shop, a youth is let loose upon the regular chemist, who soon discovers that he will have many an anxious hour before he gets him into anything like shape for his duties. He strongly advised all apprentices and assistants to avoid the doctor's shop, and expressed a hope that the recent action of the Pharmaceutical Society in Glasgow would have the effect of putting a stop to such a state of things.

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The reading of the papers was followed by a discussion, taken part in by Messrs. Dey, Hill, Lothian, McBain, McEwan, Simpson, and Sutherland, and on the motion of the chairman a cordial vote of thanks was awarded to the authors.

The chairman directed attention to the new syllabus the prize schemes, and urged apprentices to enter competitions.

The meeting then closed.

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## NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

### ANNUAL DINNER.

The twenty-sixth annual dinner of the members of the Nottingham and Notts Chemists' Association was held in the Masonic Hall, on Wednesday evening, December 6, the President, Councillor R. Fitzhugh, J.P., occupying the chair. Among the guests were Lord Henry Bentinck, the Mayor of Nottingham (Mr. R. Pullman), Professor Clowes, Councillors Brittle and White, Dr. Collins, the Chief Constable (Mr. P. S. Clay), Messrs. Parr, Rogerson, Mason, Beilby, Eberlin, Rayson, Savage, J. F. Dennis, G. A. Dennis, Middleton, W. H. Des Foyes, R. Widdowson, H. Manfull, W. Gill, J. Wilford, W. Ashby, G. Shepperson, Wilford, jun., R. Jackson, J. Boyle, Norwebb, Turton, Gaskin, Beverley, Calvert, Haywood, Pendleton, Lister, and Parker.

At the conclusion of an excellent repast,

The Chairman proposed the loyal toast, which was duly honoured, and

Lord Henry Bentinck then submitted the toast of "The Mayor, Magistrates, and Corporation." This was responded to by the Mayor; Councillor Brittle also replied.

The Chairman said that the next toast related to what he might call their profession. It was "Success to the Pharmaceutical Society of Great Britain." That Society, as they knew, was the parent society of all the societies in the kingdom. They looked to that society for help and assistance in their business transactions, and he thought they would agree with him that of late years that society had been more in accord with their views than it was in years gone by. He now felt that it would do everything it possibly could for the advancement and prosperity of the chemists and druggists of the country. In conclusion the Chairman referred with regret to the absence of Mr. Parker, the local secretary of the Pharmaceutical Society for Nottingham.

Mr. Wilford, in responding, said that as the Chairman had said, the Pharmaceutical Society had not always done what the chemists thought the best for the interests of the trade; but latterly they seemed to have taken a better view of their requirements, and had done something more for them. As Mr. Parker had told them, they had the matter in their own hands, for if they joined the Society they could give expression to their views through their representatives on the Council.

Mr. Rogerson, in submitting the toast of the evening, "Success to the Nottingham and Notts Chemists' Association," said that he was sorry to see so few members present. He was, however, convinced that it was through no want of interest in the Association, which had much to be proud of. When the Association was started twenty-six years ago it was to unite in good fellowship the members of their trade, but the Association did not stop at that. It formed classes for the better education of their apprentices, and in that way had really done a good work.

The Chairman, replying to the toast, explained that many members had been kept away through illness. He had no fault to find with the members of that Association. They always responded heartily to the calls of the treasurer, and so long as they subscribed to the funds in that way, and took an interest in the welfare of their apprentices and the younger members of the Association, he was well content. They had a great deal to be thankful for as an association. He had been President for the last seventeen or eighteen years, and he took as great an interest in it that day as he did at the commencement. Their alliance with the University College had been of vast importance to them, and he hoped that before long Nottingham would become a centre for examinations, instead of the whole of the provincial apprentices having to go to London.

Mr. Wilford also responded, and said that for the first time for many years he should have to report a balance on the right side at the next meeting, due to an alteration in the scale of fees for students at the classes.

Mr. Eberlin, in proposing the health of "The Teachers," paid a high tribute to the excellent qualities of Professor Clowes and his fellow-teachers.

Professor Clowes, in acknowledging the toas id that he felt the deepest interest in the classes given in connection with that Society, and he felt strongly that they ought to be continued. He had thirty students at the present time, working extremely well, and Mr. White, he knew, was well satisfied with his class. If difficulties should arise he hoped they would meet them in the best spirit possible and endeavour to come to some agreeable arrangement by which that useful work should not be impeded.

Other toasts followed, and during the evening an enjoyable programme of vocal and instrumental music was contributed to by Messrs. P. S. Clay, P. W. Pendleton, R. Hodges, W. W. Lester, J. Sanders, W. Townley, Wilford, jun., Mr. H. Woodhouse being the accompanist.

## MANCHESTER PHARMACEUTICAL ASSOCIATION.

The second ordinary meeting was held at the Victoria Hotel on Wednesday, November 13.

The chair was taken by the President, Mr. G. S. Woolley.

A paper on "Hydroxyl and its Compounds—especially with Carbon," was read by Mr. Charles Turner, F.C.S.

At the close of this paper a discussion took place, in which the President and several members took part.

Mr. Kemp, in proposing a vote of thanks to Mr. Turner, remarked upon the very lucid manner in which the subject had been placed before them, which had greatly assisted them to follow him and understand the diagrams.

The vote of thanks was seconded by Mr. Holt and supported by Mr. Walter Gibbons. At the close of the discussion Mr. Turner presented to the Association a collection of microscopic slides, illustrating the structure of cinchona barks and lichens. These were accepted by the President on behalf of the Association, and thanks were tendered to Mr. Turner for his gift.

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The Association met on Thursday, December 7, Mr. W. L. Currie presiding, when Dr. G. Bell Todd gave a lecture on "Parasites and their Hosts," illustrated by means of a series of slides with oxyhydrogen light. The views were remarkably clear, and showed the minutest details in the structures represented. These comprised several species of tapeworm, fluke, guinea and hair worms, and parasites affecting the skin. A hearty vote of thanks was accorded on the motion of Mr. Boyd, seconded by Mr. Adam, and the President also expressed his enjoyment of the lecture and the obligation the Association was under to the lecturer. This concluded the business.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

The members of this Association held a very successful social and musical evening on Thursday, December 7, when a good programme of violin and piano solos, banjo duets, and songs, arranged by Mr. E. H. Church, was gone through, and thoroughly enjoyed by the party present, which numbered thirty-four.

# Parliamentary and Law Proceedings.

### PROSECUTION UNDER THE PHARMACY ACT.

On Monday last, before His Honour Judge Austin, at the Weston-super-Mare County Court, the Council of the Pharmaceutical Society of Great Britain (by Richard Bremridge, the Registrar of the said Society, by the authority of the said Council) sued Wyndham R. Burston, of the West of England Supply Stores, High Street, Weston-super-Mare. Plaintiffs claimed £5 for amount of penalty incurred by the defendant on May 10, 1893, in keeping open shop for the retailing, dispensing, or compounding of poisons, to wit, a preparation of aconite called "Henry's Nervine," contrary to the provisions of the Pharmacy Act, 1868 (31 and 32 Vic. Cap. 12). Plaintiffs also claimed £5 penalty in respect of an alleged offence on June 22, 1893.

Mr. T. R. Grey, barrister-at-law, instructed by Messrs. Flux, Son and Co., of 3, East India Avenue, London, E.C., appeared for the plaintiff Society, and the defendant was represented by Mr. Bonsey, barrister-at-law, instructed by Messrs. Neve and Beck, 21, Lime Street, London, E.C., on behalf of the Patent Medicine Vendors' Defence Association, Limited.

Mr. Grey pointed out that the Act under which proceedings were taken was an amendment of the Pharmacy Act, 1852, and regulated the sale of poisons. The preamble of the Act stated that it was expedient for the safety of the public that people keeping open shop for the retailing, dispensing, or compounding of poisons should have a practical knowledge of their business; that they should be duly examined and their names entered on a register. The first section provided that it should be unlawful for any person to sell or keep open shop for the retailing or compounding, etc., of poisons, unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of the Act, and registered under the Act. Section 2 enacted that the several articles enumerated in Schedule A should be deemed poisons, and his Honour would notice that the fifth on such schedule was aconite and its preparations. That would be the poison involved in the present case. Having pointed out the absence of the defendant's name from the printed register of the Pharmaceutical Society, Mr. Grey read section 15, which provides that any person who shall retail or compound any poison without being qualified to do so should be liable to a fine of £5 for each offence. In this case, on May 10 and June 22 purchases were made at defendant's shop of a preparation called "Henry's Nervine." (The learned gentleman here put in the two bottles, the labels of which bore the words, "for outward application only," one of them being also marked "poison"). What they had to deal with was whether the mixtures in the bottles contained a poison named in the schedule of the Act. He would be able to prove, through the evidence of two analysts—most experienced in their profession—that each bottle undoubtedly contained a most powerful alkaloid of aconite. If this mixture was administered internally it would be most injurious to health or prove fatal. In one of the small bottles produced there would be enough poison to kill six men. Mr. Grey then quoted from the case, Pharmaceutical Society *v.* Piper, in which it was held that under the Act the prohibited sale of poison was not only confined to poisons in a simple state, but extended to the sale of compounds containing poisons mentioned in the schedule of the Act.

Harry Moon, clerk in the offices of the Pharmaceutical Society, stated that on May 10 he went to defendant's shop and purchased the bottle of "Henry's Nervine," produced, afterwards handing the same to Mr. Eastes, an analyst. Subsequently a Mr. Garrett handed him another bottle of the same mixture, which he likewise handed to the analyst.

Daniel Garrett, of Bristol, deposed that on June 22 he purchased a bottle of Henry's nervine at defendant's shop, handing the same subsequently to Mr. Moon, the previous witness.

Cross-examined by Mr. Bonsey: He was instructed by Mr. Moon to make the purchase.

Arthur Pearson Luff, Doctor of Medicine, Bachelor of Science, etc., and official analyst to the Home Office, examined by Mr. Grey, stated that he had considerable experience in the practice of chemistry, extending over several years. He had subjected the contents of the bottle No. 1 to a careful analysis. The bottle contained a liquid of a brownish colour, and slightly acid. He was decidedly of opinion that it contained the poison aconitine, which was an alkaloid extracted from a plant called aconite, and popularly known as "monk's hood:" it was one of the most poisonous substances known. He had taken from the bottle 25 drops of the mixture, from which he extracted one-fifth of a grain of the alkaloidal residuum. As regards the result of the test, negatively he found an absence of all other alkaloidal poisons. There was no chemical test for aconitine itself; the only result of such a test would be that the presence of an alkaloid might be detected. There were two other tests, however, and these were physiological tests, both of which he had employed with positive results. The first test was upon himself. He placed a small quantity of the residuum, in solution, upon his tongue, when he experienced a peculiar tingling, followed afterwards by numbness of the tongue, and a soreness at the back of the throat. The sensations lasted from three to four hours, and, taken altogether, he regarded them as characteristic of aconitine. The whole of the sensations would not be characteristic of any other alkaloid, and this was borne out by many authorities of long experience. He had devoted two years exclusively to a study of aconitine and other alkaloidal poisons. The tests he had made in the present instance were precisely similar to those used by Dr. Stevenson, in connection with the Lamson case. The other physiological test he had alluded to was upon a mouse. A minute quantity of the alkaloidal residue from the 25 drops was injected under the skin of the mouse, which died in fifteen seconds with every symptom of aconite poisoning.

Cross-examined by Mr. Bonsey: He had applied the colour test to the residuum incidentally in connection with the other tests, but not for aconitine, as no colour test would be of the least avail. There was a colour test for impure aconitine, but not for pure. His opinion was based entirely on the physiological tests, and the proved absence of other alkaloidal poisons. There were other alkaloidal poisons which could be discovered by the colour test, and these he had endeavoured to find, but failed. The witness was then cross-examined at some length by Mr. Bonsey as to the tongue test of veratrine, the witness expressing his non-agreement with some of the dictums laid down in "Guy and Ferrier" on this point. He did not consider the book was quite up to date, and it did not include a series of researches which were made by himself in conjunction with Dr. Wright. The results from veratrine and aconitine being placed on the tongue were different. There was a numbness from veratrine, but the tingling sensation was not at all similar. When he made the test he was not testing for veratrine, and that question was not in his mind. He had not compared the symptoms from the application of aconitine and veratrine within a short period of each other. He had proved the absence of veratrine, however, by a chemical test—by hydrochloric acid.

Mr. Bonsey inquired how Dr. Luff defined poison: there were many lotions and medicines in which the ingredients were poison; so how could he define between medicine and poison?

Witness: A poison may be a medicine if used in non-poisonous doses; then it is not a poison at all.

Mr. Bonsey: Supposing I had a tonic with strychnine as one of the ingredients, would that be a poison?

Witness: That depends upon the quantity and the size of the bottle.

His Honour: Perhaps Mr. Bonsey would have it in by the cask.

Ernest John Eastes, analyst, and a Fellow of the Institute of Chemistry, in answer to Mr. Grey, stated that he had analysed the contents of bottle No. 2, and found aconite in the same. He quite agreed with the previous witness's remarks, and had made similar tests, with the exception of the experiment on the mice. The solution from the bottle he had compared with two specimens of the tincture of aconite of the British Pharmacopœia, and found it to be much stronger than the latter.

Cross-examined by Mr. Bonsey: He had tested veratrine. As to the sensations from the two drugs being similar when placed upon the tongue, he admitted that the feeling at the back of the throat was somewhat similar, but the numbness of the tongue and inside the lower lip was very different. There would be scarcely any tingling sensation in the case of veratrine. He was confident as to the symptoms of the veratrine test; in fact, he had made such a test within a few days of the one for aconite.

His Honour: It is a pity there is not a jury in this case, because then they would be able to taste the samples—perhaps the Registrar would like to do so?

Witness was of opinion the symptoms could not possibly be mistaken. He had applied the colour test by the action of sulphuric acid, with the result that a yellow colour appeared, gradually changing to red. The colour, however, was obtained from impure aconitine; pure aconitine gave no colour.

Mr. Bonsey: If you had impure aconitine, and also veratrine, and applied sulphuric acid to each, do you say that the colour of the reaction is similar in the two cases?

Witness: It is very similar, and not easy to distinguish. He considered the only reliable test was the physiological, and placed very little reliance on the sulphuric acid test.

Dr. Luff, recalled, in answer to his Honour, stated that veratrine was similar to aconitine, in so far as it was an alkaloid, and that it was a poison. He had made the test with hydrochloric acid, but there was no result as regards colours.

Cross-examined by Mr. Bonsey: His tests would have disclosed any veratrine had there been any in the mixture. Veratrine was a powerful irritant to the membranes of the nose, but there was an absence of any inclination to sneeze, when he applied the residuum to his nose. Had he been told that veratrine had existed in the mixture he should have used precisely the same tests as in the present case.

Mr. Bonsey, in opening the case for the defence, said if he could satisfy his Honour that the mixture did not contain aconitine, his client was of course entitled to succeed in his case. Referring to the case of the Pharmaceutical Society *v.* Piper, the learned counsel said, firstly, the Act did not apply to a poison when it was merely an ingredient in a compound; and, secondly, there was no evidence to show that the preparation in question was a poison, but only that one of the ingredients was in the case alluded to, and the judges had some doubt as to whether they were really right in their decision. He should take the same points as Piper's case covered; and these were not altogether frivolous points. It was a difficult Act to construe, and except incidentally and indirectly—as the judges admitted—the Act did not apply to the ingredients at all; they were only referred to in the 17th section. [His Honour: I consider myself bound by the Piper decision.] From the evidence which he proposed to call, he thought he would be able to prove that the mixture did not contain any aconitine, and he was sure his Honour, from the evidence already heard, had come to the conclusion that there was a great deal of similarity between the results of veratrine and aconitine tests. Having touched upon the facts that Dr. Luff had not had veratrine in his mind when the tests were made, and that the symptoms of the two drugs were very similar, Mr. Bonsey contended that immediately after the two analysts had completed their tests with aconitine they should have also made tests with veratrine, and then compared the two sets of symptoms. There was a great similarity between the two drugs, which might lead persons to make mistakes, unless at the time their minds were drawn to the question as to whether the mixture contained veratrine.

Page Woodcock, examined by Mr. Bonsey, deposed that he was a patent medicine manufacturer carrying on business at Lincoln. The contents of the bottles produced were manufactured by him. The mixture did not contain any aconite or aconitine, but it contained veratrine.

Cross-examined by Mr. Grey: He was not a chemist. The mixture had been manufactured under his personal supervision for the last twenty-five years; he had succeeded his father in the business four years ago. He knew the nature of aconitine and had had something to do with it when preparing for the Minor examination. The veratrine had been supplied to him by a most respectable London firm of wholesale druggists. He obtained the veratrine in packets of four ounces at a time, and that quantity lasted him three or four months. Judging from the labels on the bottles produced, he thought the contents might have been manufactured about fourteen years since.

William James Leggett, storekeeper, of Liverpool, deposed receiving the bottle of "Nervine" (produced) from defendant, and forwarding the same to Mr. Davis.

Wyndham R. Burston, the defendant, proved sending the bottle taken from his stock to the previous witness.

Edward Davis deposed that he was an analytical consulting chemist of Liverpool. He had had forty years' experience, and had appeared as witness in many poisoning cases, the Maybrick case amongst the number, he then appearing for the prosecution. He had made an analysis of the mixture handed to him by the witness Leggett, and he was quite sure that it did not contain aconitine. He had applied both physiological and chemical tests, both to the mixture and to veratrine, with precisely similar results. Having adduced other evidence in support of his contention that the solution was veratrine, more particularly with regard to the colour tests, the witness said the colours resultant from the application of hydrochloric acid were those which would be yielded by veratrine. After some further examination, at the request of his Honour, the witness produced the residuum extracted from the mixture forwarded to him by Leggett, and proceeded to demonstrate the chemical test with sulphuric acid, when the results were such as he had stated in evidence.

Mr. Grey cross-examined at considerable length.

Witness stated that he was unable to make any physiological tests on mice, as he had no licence to perform such experiments.

Dr. Luff, recalled, remarked that Mr. Davis had conducted the experiments in the most fair manner, but he wished to point out that as a test the proceeding had been valueless. He (Dr. Luff) had been given no opportunity of showing by counter experiments contrary reaction, and the colour which Mr. Davis had obtained from the residuum of the "Nervine" was precisely the colour which might have been obtained from impure aconitine; and such residuum he believed to have been impure aconitine.

His Honour: On the other hand, I have no proof it is other than the veratrine of commerce.

Mr. Grey, in an able rejoinder, pointed out the high qualifications of the two analysts called for the plaintiffs, and referred to the reliability of physiological tests as compared with chemical tests, which he maintained were almost worthless in this particular case.

His Honour, in summing up, remarked that plaintiffs held that the "Nervine" was a poison, to wit, a preparation of aconite, and, therefore, were bound by their principles to prosecute. Even if he considered the preparation was not proved to contain aconitine, but veratrine, he should certainly not allow any amendment of particulars of claim, because—though these prosecutions were of the greatest value, and the Act should be stringently enforced by all who had any power to do so—they could not close their eyes to the fact that the proceedings savoured of a criminal character. He had had before him some extremely interesting evidence from Dr. Luff and Mr. Eastes, both of whom had examined the preparation; from Mr. Davis, the analytical chemist; and also evidence of great importance from the manufacturer, who probably derived considerable profit from the sale of that particular drug. The reason why he considered Mr. Woodcock's evidence of such value was because, when one's mind was in the balance between the *ex parte* evidence of one side and the *ex parte* evidence of the other, the fact that the manufacturer came forward and testified that for twenty-five years past he had personally superintended the manufacture of the preparation, and that he had used veratrine—obtained from a respectable firm—as an ingredient, and also knew the difference between the two drugs, he could hardly help being influenced by such evidence. When he had the evidence—which he saw no reason to doubt—before him, it threw a light upon the serious question as to whether the plaintiffs had made out their case by the evidence they had called. He was bound to say all the experts had given their evidence, as one would expect persons of such distinction as Dr. Luff, or the experience of Mr. Davis and Mr. Eastes, to give, with the greatest fairness, and without any reserve or desire to exaggerate either one way or the other. At the same time, one had to look at their evidence with this reservation, viz., that Dr. Luff at the time of starting his analysis was not hunting for veratrine, and very early in the course of his inquiry felt satisfied there was none in the preparation; and on the other hand that Mr. Davis started on the scent of veratrine, because it had been suggested to him; and he proceeded, more or less, with the intention of finding it—not as a matter of dishonesty by any means, of course. It appeared from Dr. Luff's evidence that three things had impressed his mind as to the presence of aconitine, first, the negative results of the chemical tests as to other alkaloids being contained in the preparation; and secondly, the two results of his physiological tests. Apart from the remarkable fact which had been weighing his mind, that by the hydrochloric acid test Dr. Luff obtained no reaction for veratrine—and that was a difficulty which he felt—he thought the evidence of Dr. Luff must be read subject to the fact that that gentleman was not looking for veratrine, and the fact that the results of physiological tests, both as regards the finding of aconitine and veratrine, were somewhat similar. It only showed how experience might differ on a matter so difficult as a physiological test case. He should not, in fairness, be influenced by the experiments shown in the court, on account of the difficulty of deciding as to the exact nature and purity of the solution obtained from the sample of "Nervine." If Dr. Luff had been able to tell him that he had also experimented on mice with veratrine, and that the results were different in degree to the experiments made with aconitine, it would have had a great deal of weight with him; but Dr. Luff admitted that he had not done so, but had only injected mice with aconitine. In view of the similarity between these drugs, as shown by the evidence, and the statement by the manufacturer that the ingredient used by him was veratrine, he was obliged to come to the conclusion—subject to any very marked failing on the part of Mr. Davis to support the case—that the plaintiffs had failed to make out their case. The drug might be veratrine or it might be aconitine; he was not satisfied which of the two it was; and this it was the duty of the plaintiffs to prove in order to succeed with their action. It might be that veratrine was a poison, so that proceedings could be taken under the Act, and possibly when Mr. Bonsey next came before the court, in an action brought against Mr. Woodcock for selling veratrine, he would maintain that it was aconitine. In his verdict for the defendant his Honour granted costs, and also leave to appeal if desired, but he was of opinion that the matter was one of fact and not of law.

### PROSECUTIONS UNDER THE SALE OF FOOD AND DRUGS ACT.

On Monday, December 4, at the Bishop Auckland Police Court, before Mr. G. Pears and other magistrates, two summonses were heard against Mr. John Shaw,* chemist, of Newgate Street, under the Food and Drugs Act. In the first Mr. Shaw was charged with selling tincture of rhubarb that was deficient in proof spirit. Mr. T. Dunn, inspector, prosecuted, and Mr. Shaw was represented by Mr. Booth.

William A. Suddes, assistant to Mr. Dunn, said on November 14 he visited Mr. Shaw's shop, and was supplied by the defendant with six ounces of tincture of rhubarb. He divided it in accordance with the Act, giving the defendant one part and the other two he handed to Mr. Dunn.

Mr. Dunn said he forwarded one part handed to him by Suddes to the county analyst, who had reported that it was deficient in proof spirit to the extent of 14 per cent. In other words 14 per cent. of extraneous water was present. He was of opinion that such sample was not a sample of genuine tincture of rhubarb.

Mr. Shaw, the defendant, then went into the witness box, and said he purchased the tincture of rhubarb some time ago from a good wholesale house as of the strength recognised by the British Pharmacopœia, and received a document along with it. The label was printed, and the letters B.P. were also indicated on the invoice. The tincture came to hand three weeks or a month before the visit of Mr. Dunn's assistant, and he was the first served out of it to the best of his recollection. The day was a cold one on which he was served, and no doubt that caused the strength of the proof spirit to deteriorate. A cold day would be more likely to cause the spirit to evaporate, and he could not account for it losing strength except through the evaporation. There had been nothing added; it was sold just as he received it. He had been in business sixteen years, and that was the first case of the kind brought against him. He took every precaution to have his drugs pure and of the best strength. Cross-examined: He kept no tincture of rhubarb except B.P.

The Chairman (Mr. Pears) said that the Bench found as a fact that the invoice did not constitute a warranty. The case was not a very serious one, and they thought it would be met by a fine of 2*s*. 6*d*. and costs.

Mr. Shaw was next summoned for selling sweet nitre that was deficient in nitrous ether.

Mr. Booth said practically the same state of facts applied in this case as in the last.

Mr. Suddes proved the purchase of six ounces of sweet nitre, one part of which he handed to Mr. Dunn, and that gentleman said he had forwarded it to the county analyst, who had reported that it was deficient in nitrous ether to the extent of 60 per cent., after making due allowance for trade contingencies. It was not, he added, a sample of sweet nitre B.P., and was useless for the purposes intended.

Mr. Booth said the facts were the same. The nitre had been in stock all the summer, and during that time the evaporation had gone on, and so reduced the strength. Mr. Shaw gave the best price and received the same warranty as in the other case.

The Chairman: He will be fined 2*s*. 6*d*. and costs in this case.—*Auckland Times and Herald.*

### ACCIDENTAL POISONING BY CHLORAL.

The inquiry into the circumstances attending the death of the late Professor Tyndall was held on Thursday, December 7, at Hindhead House, Haslemere, before Mr. Roumieu, the Coroner for West Surrey.

Mrs. Tyndall, on being sworn, said her husband had been in ill health, wrestling with death, for three years. He took a small dose of chloral every night, and on alternate mornings he took sulphate of magnesia. Two bottles were kept side by side and labelled. On Monday she gave him what she believed to be sulphate of magnesia, and he afterwards drank a little ginger ale. He remarked subsequently that his draught had a curious sweet taste. Witness then tasted the drops remaining in the glass, and found that it was chloral. She then looked upon the table, and saw there were two chloral bottles, and that the sulphate of magnesia bottle stood behind one of them. She had taken two tablespoonfuls from one of the chloral bottles. Deceased jumped out of bed, and, assistance having been summoned, they took steps to rouse him. Dr. Winstanley was sent for, and she meanwhile administered an emetic. Drs. Winstanley and Hutchinson afterwards arrived, and everything possible was done to save her husband, but he died in the evening.

Dr. Winstanley deposed that he used the stomach pump, and deceased rallied somewhat and regained a certain amount of consciousness. He relapsed, however, and when Dr. Buszard arrived the professor was moribund and gradually sank.

Dr. Buszard said he arrived at Haslemere from London about five o'clock on Monday. Professor Tyndall's condition was then hopeless. Had he been tolerably strong he would have recovered. Dr. Buszard added that he had known Mr. and Mrs. Tyndall for four years. They were on most affectionate terms, and he had no doubt the mistake was unintentional. He had never seen Mrs. Tyndall's devotion to her husband surpassed, and he did not think equalled.

The jury found that he died from an overdose of chloral accidentally administered for sulphate of magnesia by Mrs. Tyndall.

The coroner, in summing up, said that Mrs. Tyndall had done everything that a woman could do under the circumstances.—*Star.*

### POISONING BY SALTS OF LEMON.

Mr. S. Hacker on Monday, December 11, at Kingsbridge, investigated the circumstances attending the death of Caroline Jane Wingate, widow of the late Samuel Wingate, master mason. Ever since the sudden death of her husband in July last she had been in a low, desponding condition. On the previous Monday she took some salts of lemon and precipitate powder. Both were marked "poison" in accordance with the Pharmacy Act.—The jury returned a verdict of "Suicide while temporarily insane."—*Western Morning News.*

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* This name does not appear on the Register of Chemists and Druggists for 1893.

### POISONING BY PRUSSIC ACID.

Mr. D. Wightman, Coroner, held an inquest on Saturday, December 9, at the Bay Horse Hotel, Westbar, Sheffield, on the body of Joseph Edward Dyson, 63, chemist, who carried on business at Westbar Green, and died on Thursday. He was a heavy drinker, and had been for the past twenty years. He was also in the habit of taking laudanum. He had never threatened to commit suicide. On Thursday he remained in bed until two o'clock in the afternoon, and then went downstairs, and passed through the sitting-room into the shop. He sent a boy out for some spirits, and in a few minutes returned to the room. He sat on the sofa and commenced to untie the handkerchief which was round his neck. His son, William Henry Dyson, asked him what he had taken, but the deceased made no reply. Shortly afterwards his breathing became heavy, and Mr. Ryves, surgeon, was sent for. He expressed the opinion that the deceased was in a fit, and as it was known that he had mixed a draught for himself in the shop, the stomach pump was applied, but without any result. In about a quarter of an hour he died. The errand boy, Frank Clark, who bought whisky for the deceased on Thursday, said he fetched some of that spirit every day, which the deceased mixed with sweet nitre and laudanum, and drank. This he did on Thursday. The boy found the bottle which contained the prussic acid had been moved and the bottles round about disturbed. The deceased's son could not say whether his father had taken prussic acid, as there was not much in the bottle, and he could not see any difference in the quantity after his father's death. He said his father had taken prussic acid on previous occasions.

The Coroner said there was no doubt that the deceased had died from a dose of prussic acid, but for what reason it was taken was for the jury to decide.

A verdict was returned that the deceased died from a dose of prussic acid, but with what intention it was taken there was not sufficient evidence to show.—*Sheffield Independent.*

### POISONING BY STRYCHNINE.

At an inquest held on Wednesday, December 6, the death of Catherine Houghton, the wife of a draper, of 10, Selwood Place, South Kensington, was shown to have been caused by strychnine. She had left a letter, which read as follows:—"I, Catherine Houghton, take poison of my own free will. It is no fault of my husband, who is too good and kind to me." She was said to be a very sensitive woman and highly strung, but her husband had no reason to think her mind was deranged.

Dr. Edward Gregory, of 168, Fulham Road, said death was due to strychnine poisoning, and the jury returned a verdict of "Suicide whilst temporarily insane."—*Morning Leader.*

### POISONING BY OPIUM.

The Liverpool City Coroner, Mr. T. E. Sampson, held an inquest on Tuesday, December 5, respecting the death of Sarah Amelia Holden, 49, widow of a Customs officer. The deceased, who lived at 28, Kingsley Road, had for some years suffered from insomnia and pains in her side, and she had been accustomed to take narcotic powders containing an amount of opium. On Friday last she became ill, and said she would have to take some sleeping powders. Afterwards she became unconscious, and she died the same day. Dr. Telford stated that the deceased was a woman of delicate constitution. He did not know that she had been taking the powders referred to. A small quantity of opium would have overcome her. Death was due to opium poisoning. A verdict of "Death from misadventure" was returned.—*Liverpool Daily Courier.*

### ACCIDENTAL POISONING BY CARBOLIC ACID.

On Thursday, December 7, Dr. G. Danford Thomas, Coroner for Central London, held an inquest at the Hampstead Provident Dispensary Hall, New End, on the body of William Townsend, aged 65, a gardener, of 72, Fleet Road, Hampstead, who died under the following circumstances: Deceased was ill and was confined to bed. He was attended by Dr. Baskett, of Crossfield Road, South Hampstead, who had known the deceased and his wife for very many years, and took a kindly interest in them. The doctor used carbolic acid dressings, and had been in the habit of carrying the carbolic acid to and from the house himself until he asked Mrs. Townsend to let him leave it there in a little box with the other materials for the dressings. Mrs. Townsend was at the doctor's house on Monday evening, and he gave her some diluted carbolic acid lotion to take back with her for him to use on his visit in the morning. Instead of placing it, as usual, in the little box in the sitting-room, Mrs. Townsend, being tired on her return home, put the bottle containing it on the washstand in the bedroom, near the bottle containing the medicine which her husband had to take. Soon afterwards her husband asked for his medicine, and she inadvertently gave him a dose of the carbolic acid lotion. After drinking most of it he said to her, "I think you have made a mistake and given me the wrong medicine." She then saw what she had done, and immediately summoned medical aid, but her husband died in a quarter of an hour. The two bottles were produced in court. Both were ordinary medicine bottles of similar make, each bearing a label as to how much was to be taken, and neither marked "Poison." The medicine glass was a coloured one. The jury returned a verdict of death by misadventure, exonerating the widow from blame, and expressed their opinion that for such lotions blue fluted glass bottles should be used.—*Daily News.*

### POISONING BY OPIUM.

Mr. G. P. Wyatt, coroner, held an inquiry at Brixton on Monday, December 11, respecting the death of John Tucker, aged 73 years, a chiropodist. The deceased, who had failed in business, had frequently written poems, in which he intimated his intention of committing suicide, and on Thursday last he was found on his bed in a state of collapse. The usual methods to restore consciousness were resorted to, but without effect. Death was due to opium poisoning. The jury concluded that he had committed suicide while insane.—*Morning.*

### EXCISE PROSECUTION AT NEWRY.

#### THE USE OF METHYLATED SPIRIT.

At the Petty Session held at Newry, on Wednesday, December 6, before Mr. Henry Turner, R.M. (presiding), and seven other magistrates, an important case was heard in which Dr. Samuel Connor, J.P., chemist and druggist, Hill Street, Newry, was prosecuted by the Inland Revenue for having sold methylated spirit in tincture of croton and tincture of iodine, contrary to Act of Parliament. The offence having been proved, the magistrates fined the defendant £25, with a recommendation that the fine should be reduced to one shilling.—*Northern Whig.*

## Obituary.

Notice has been received of the death of the following:—

On December 5, at Pemberton, Lancs, Henry Widdows, Chemist and Druggist. (Aged 77 years.)

On December 6, Frederic Blades, Chemist and Druggist, formerly of Moseley Road, Birmingham. (Aged 51 years.)

On December 6, Robert Brown, Chemist and Druggist, of Bernard Street, Leith. Mr. Brown was formerly in business in Edinburgh, and for many years was an associate in business of the Society.

On December 7, Joseph Edward Dyson, Chemist and Druggist, of Sheffield. (Aged 63 years.)

On December 7, William Howell, Chemist and Druggist, of Bristol. (Aged 81 years.)

On December 8, Peter Holland Jackson, of the firm of P. H. and W. Jackson, Chemists and Druggists, of Altrincham. (Aged 59 years.) Mr. Jackson was a member of the Society, which he joined in 1869.

On December 9, Rhodes Bramwell, Chemist and Druggist, late of Windsor Street, Liverpool.

## Correspondence.

### Podophyllin Resin.

Sir,—May I be allowed a few remarks upon the above subject, which appeared in the Journal of November 25, in which Messrs. Gravill and Sage suggest the probable cause of difference in colour of various samples of resin to be the temperature at which it is dried. Some year or two back I operated upon 7 lbs. of good rhizome obtained from a house of standing, and was astonished to find the resin of a yellow colour, almost as bright as good powdered rhubarb; the temperature I dried at was 70° to 75° F. I therefore procured two other small parcels from different houses, and found the same coloured resin in each sample, which I may state were totally soluble in rectified spirit. I notice the Pharmacopœia says it should be dried in a stove, but mentions no temperature, so I precipitated some more resin and dried at 150° F.; the result was about the usual colour, and I further noticed that the higher the temperature the darker the resin. It is to be hoped that in the future editions of the Pharmacopœia the temperature of drying the resin will receive adequate attention, because one sample dried at 75° F. will give the B.P. tincture the colour of sherry, while that of the commercial samples is frequently as dark as port; so I agree with the authors of the paper in that "colour is not a material characteristic of its genuineness."

*Birkenhead.* A. F. Brookes.

### The Application of Electrolysis to Qualitative Analysis.

Sir,—In the useful paper by Mr. C. A. Kohn on the above subject, recently reprinted by you in the *Pharmaceutical Journal*, the author urges the suitability of the methods described for the detection of poisonous metals in urine. The paragraphs on the separation of mercury give the outline of the general mode of procedure, and I would draw attention to a detail which is essential for the deposition of mercury from urines containing iodides. It is the complete removal of the iodine before commencing the electrolysis. This elimination, which can be effected by treating the urine with fuming nitric acid after the destruction of the organic matter in the usual way by means of hydrochloric acid and potassium chlorate, should not be omitted. If this precaution is neglected, the iodine liberated from its compounds collects in black masses round the electrode, and prevents any deposit of mercury thereon. Drs. Neubauer and Vogel, in their excellent work on the analysis of urine, note this point, and as iodine in various combinations is frequently prescribed in connection with a treatment with mercury, it is one that should not be lost sight of.

*Bow, E.* Arab.

### Dispensing Difficulty.

Sir,—The question when and how far a dispenser is justified in departing from the strict letter of a prescription may be viewed from other standpoints than those taken up by your two correspondents of November 25. These gentlemen settle the matter to their own satisfaction from the literalist and authoritative point of view. May I be allowed to state a case for the opposition? The whole question of the relationship of the pharmacist to the physician is involved in this dispute and the *locus standi* they severally occupy. Is the doctor a paragon of pharmaceutical wisdom and a master of pharmacopœial synonyms? Would that he were! But one's experience goes to prove that it takes the average medical man all his time to know the ordinary names correctly, to say nothing of their synonyms. Dispensing would be a much simpler business than it is if prescribers were perfect either as regards caligraphy, compatibility, posology, or nomenclature, and "dispensing queries" would vanish from your columns. And the chemist—what is he educated for if not to be the physician's right hand man? To what purpose his training and experience and his common sense, if not to correctly interpret the prescriber's intentions and act as a check on errors, whether of ignorance or inadvertence? Surely the pharmacist is something more than a mere machine for turning out prescriptions as written, with "authority" to fall back upon if the medicine miss its mark! The comfort—nay, the health, and may be even the life, of a patient is often at stake in these cases, and just as a chemist would hesitate to dispense an evident overdose, so should he be equally careful to ensure that his customer does not get a palpable underdose, through the inadvertent use by the prescriber of a synonym of whose existence he was unaware. It does not require much imagination to realise what a loss it would be to an agonised or sleepless patient to have administered to him a twelfth instead of half a grain of opium. But it may be prudent to draw a veil over the feelings (and the language) of the medical man on discovering that his wishes had been so misinterpreted. I maintain, therefore, that more insistence must be laid on the spirit than on the letter. The intention of the prescriber and the interest of the patient are the paramount considerations which should guide the pharmacist in the responsible and ofttimes difficult part he has to play.

*Brighton.* C. S. Ashton.

*R. Payne.*—Your letter has been handed to the advertisement agents, to whom it should have been addressed.

## NOTICES OF MEETINGS NEXT WEEK.

### Wednesday, December 20.

*Royal Microscopical Society*, at 8 p.m.
"On the Ultimate Structure of *Pleurosigma angulatum*," by T. F. Smith.
"A New Screen for Monochromatic Light," by J. W. Gifford.

*Edinburgh Chemists' Assistants' and Apprentices' Association*, at 9.15 p.m.
"Notes and Queries," conducted by Wm. Duncan.

*Western Chemists' Association (of London)*, at 9 p.m.
"*Résumé* of the Work of the Association," by F. Andrews (President).

### Thursday, December 21.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
Debate on "Pharmaceutical Ethics" and "Retail Prices."

*Chemists' Assistants' Association*, at 8.30 p.m.
Musical and Social Evening, under the direction of the Honorary Secretaries.

*School of Pharmacy Students' Association*, at 7 p.m.
"A Rubiaceous 'Cascarilla,'" by A. W. Southall.
"Boron and its Compounds," by T. A. Henry.

*Chemical Society*, at 8 p.m.
"The Oxidation Products of Corydaline," by Professor Dobbie and A. Lauder.

*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
Members' Meeting.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Discussion on Retail Prices," introduced by R. H. Mitchell.

## BOOKS, ETC., RECEIVED.

The Chemists' and Druggists' Diary, 1894. From the Publishers.

Communications, Letters, etc., received from Messrs. Blackburn, Cracknell, Giles, Hill, Mitchell, Woodhouse.

## COMPULSORY PHARMACEUTICAL EDUCATION IN AMERICA.*

BY DR. OSCAR OLDBERG.

*Dean of the Illinois College of Pharmacy.*

About two hundred and fifty American pharmacists—who sat in the Seventh International Pharmaceutical Congress as the representatives of the American Pharmaceutical Association, the State Pharmaceutical Associations, the State Boards of Pharmacy, the Pharmaceutical Schools and Colleges, the Pharmacopœial Committee of the United States, and the pharmaceutical profession at large—unanimously voted with the foreign delegates in the Congress, that compulsory pharmaceutical education is necessary in all countries. This is most significant and gratifying, and justifies the hope that substantial measures of reform may now receive such support in our country that they can be carried through our legislatures.

### *Object of Pharmacy Laws.*

The justification for governmental regulation of the practice of pharmacy is the public good. The restriction or regulation of the business of preparing and vending medicines is necessary because the unrestricted traffic in drugs and poisons, and the practice of pharmacy by unqualified persons, would involve serious menace to the health and lives of the people. Pharmacy laws are justifiable upon no other ground; but that ground is sufficient. All civilised countries have pharmacy laws, because their necessity is everywhere recognised. In our own country, however, the laws we have are crude, inconsistent and, therefore, almost without value.

The evil against which the public needs protection in this direction is ignorance, and the one preventive and cure of ignorance is education. Pharmaceutical legislation cannot furnish the means and prescribe the methods of education; but its chief end and purpose is to fix and enforce a reasonable and sufficient minimum of pharmaceutical training which all persons must possess who practise pharmacy. If our pharmacy laws fail to do this in an intelligent and effective way, they are valueless.

### *Drug Stores in America.*

In no country is the necessity for intelligent pharmaceutical legislation greater or more strikingly apparent than in America. We have about 40,000 drug stores in our new country, and probably between 100,000 and 150,000 persons engaged in the business of these 40,000 drug stores. These drug stores may be multiplied without limitation, and new ones are opened daily.

Hence, commercial competition has so far reduced the profits of the retail drug business that scarcely any drug store is to be found which can be said to be exclusively devoted to legitimately pharmaceutical practice. A large proportion of the business of nearly every drug store consists of the sale of cigars, soda water, fancy goods, toilet articles, and stationery, and, in the country districts, paints and oils, wall paper and books. We are unable to determine which is more correct, to say that a large number of druggists deal in groceries, dry goods, and general merchandise, or that a large number of grocers, dry goods men, and general store keepers deal in medicines. The public good does not demand any restriction or regulation of the sale of groceries, dry goods, boots and shoes, wall paper, books and stationery, tobacco (?), soda water, candies, or paints and oils; but it does demand the restriction and regulation of the preparation and sale of medicines.

### *Classification of Drug Stores.*

The question, then, is: shall all of these 40,000 stores be treated as if they were pharmacies requiring legal control, and, if so, must they all be placed on the same level? Is it possible or necessary in the interest of the public good, to establish, through the instrumentality of state pharmacy laws and state boards of pharmacy, any satisfactory common standard of educational requirements uniformly applicable to all persons engaged in the business of these 40,000 stores? The answer would doubtless be everywhere—no, distinction should be made between proprietors, clerks, and apprentices. This division of the persons engaged in the drug business into three classes, namely: 1, proprietors or managers; 2, clerks or assistants, and 3, apprentices or learners, is common. But, is it sufficient? Should all the 40,000 proprietors or managers be treated alike or possess the same qualifications? If so, what shall be the standard? Shall the "druggist" supplying the simple wants of a few hundred people at a country cross roads town be required to have the same education and professional skill which we have a right to expect of a pharmacist who supplies thousands in one of our great centres of population? Or shall the pharmacist who dispenses a great variety of prescriptions of many metropolitan physicians, and who is daily called upon to do work which can be well performed by experts only, be placed on a par with the country druggist? Or should there not be instead at least two classes of drug stores—one class to be conducted only by well educated and experienced professional pharmacists, and another class which may be conducted by druggists of whom the law might exact less in the way of professional qualifications?

The writer believes that material progress in pharmaceutical education in this country is impossible without establishing two classes of drug stores, as above indicated, the stores or pharmacies of the first class to have the unlimited right to prepare or dispense any medicines, and those of the second class to have the right only to sell (but not to prepare or compound) medicines except simple remedies for domestic use.

A standard of pharmaceutical education such as would entitle the pharmacist to be styled a professional man can never be established if that standard is to be no higher than can be applied to the proprietor or manager of every so-called drug store in the country as is now the case.

Under our present pharmacy laws no person can sell or dispense drugs of any kind, however unimportant, without being specially licensed to do so, except that the so-called "patent" medicines, and the ready made proprietary preparations, are without reason or justification permitted to be sold by any dealer.

But any standard of compulsory pharmaceutical education high enough to command respect and afford adequate protection to the public would certainly close up at least one-half of the existing so-called drug stores or compel their owners to discontinue selling drugs. Shall their property interests be wholly ignored? That cannot be done. The only right way then would seem to be to create two different classes of drug stores, the rights and privileges of each class to bear a just ratio to the standard of knowledge and skill demanded of their proprietors or managers. Such a classification is somewhat difficult, but certainly practicable. Druggists who do not possess the education that ought to be required of a first-class pharmacist should of course not be permitted to perform those duties for which that education is requisite, while that class of pharmacists for which the highest practicable standard of compulsory training is prescribed could readily extend their professional and expert work to include the services of public analysts and sanitary experts in certain directions.

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* From the *Apothecary*, September, 1893.

But our pharmacy laws recognise and provide for but one class of drug stores, and this fact necessarily defeats their object in great measure.

### *Preliminary Education.*

Another great defect in our pharmacy laws (or in their administration?) is the failure to require that the young men, who are taken into the drug store to learn pharmacy and afterwards become the pharmacists of the country, must have that degree of preliminary education without which they can seldom become reasonably well educated and skilled in their art. This compulsory preliminary schooling is the very foundation on which alone any substantial system of pharmaceutical education can be built up. At the meeting of the Seventh International Pharmaceutical Congress in Chicago this principle was discussed and affirmed with emphasis. Michael Carteighe, President of the Pharmaceutical Society of Great Britain, said: "One often finds that a young man who has been in a pharmacy for perhaps four years, beginning at sixteen, has then to go about getting that elementary knowledge which he should have had four years before. A preliminary examination should only be a test of ordinary school knowledge, and it seems to me it is not too much to expect that the lad who wants to come into our store should be able to pass that examination before he enters, and if he cannot pass, the best thing for the master and the kindest thing for the lad is to tell his parents that he had better go into some other walk of life."

England and the United States do not yet provide for a compulsory preliminary education of persons entering drug stores to learn pharmacy; but nearly all other countries have established it, including Canadian and Australian provinces. The Congress unanimously adopted the following proposition upon this subject: "No person should be admitted as an apprentice in pharmacy unless he shall have given evidence, by satisfactorily passing a preliminary examination, that he possesses a general education sufficient for the purpose and as advanced as the conditions of the practice of pharmacy in each country may permit, and his term of apprenticeship in pharmacy should in no case be counted so far as it may antedate such evidence of sufficient preliminary education."

In the United States it ought to be practicable to enforce a preliminary education equal to that attained by the completion of the grammar school course and two years' attendance at a standard public high school. Under the existing conditions of the practice of pharmacy in the United States a sufficient compulsory general school education as a preliminary to the apprenticeship would be of far greater value than all that the pharmacy laws in their present crude state have so far accomplished.

### *Pharmaceutical Schools in America.*

At the annual meeting of the American Pharmaceutical Association in 1871, Professor Parrish called attention to the fact that "pharmaceutical education in this country is in its infancy;" that there were then "very few schools that teach pharmacy;" that there were "very few persons who are graduates of pharmacy;" and that among the members of the Association there are "many who have never graduated in a medical school or a school of pharmacy, and who make no pretensions to it." He might have added truthfully that the American colleges then in existence were mere night schools, giving no instruction except a few evening lectures weekly for about twenty weeks during the first year, and then repeating the very same lectures again during some subsequent year, without adding anything. Not an hour of laboratory practice was included in the course they gave.

The first college of pharmacy in the United States was started in Philadelphia in 1821; another at New York in 1831; the third at Baltimore in 1841. The Massachusetts College of Pharmacy at Boston was an association of druggists organised in 1851; but it did not begin to give regular courses of instruction until 1868. The Chicago College of Pharmacy was incorporated in 1859, but did not give any courses of lectures until 1870, having one graduate in 1871, none in 1872, and three in 1873. All of these "colleges" were established and controlled by druggists.

The beginnings were difficult, and the lecturers received little or no compensation. They gave their time and labour in aid of the movement. The students were clerks and apprentices employed in the drug stores of the cities in which the lectures were given, and the classes were small. One or two lectures weekly were given in each of the three branches of study—materia medica, chemistry, and pharmacy—making a total of from 60 to 120 lectures per year, these self-same lectures being repeated year after year. The student, in order to become a "graduate in pharmacy," was required to attend these courses of lectures twice. The first time he listened to them he was called a "Junior" student; the second time he listened to the same lectures, one or more years later, he was said to take his "Senior Course." But, it will be asked, how did the students occupy their time if they had only from three to six hours' instruction each week for twenty weeks in the year, and especially if the "Senior Course" was literally a mere repetition of the "Junior Course?" They were employed in busy drug stores, usually sixteen hours out of every twenty-four, and largely if not chiefly in the performance of menial work, unless the drug clerks and apprentices of twenty-five years ago were more fortunate than those of to-day.

The first school of pharmacy in America which made a substantial change for the better was that of the University of Michigan. It began its work in 1867; its course of instruction required the students' entire time and attention during a term of nine months, and it included extensive laboratory courses in its curriculum. The exalted position of the University of Michigan in the educational world, and the certainty that its work in every department is conducted with a high order of intelligence and integrity of purpose, did not, however, command for its School of Pharmacy the hearty approval and support which it certainly ought to have received at the hands of the pharmacists. On the contrary, it was antagonised and criticised for reasons having absolutely no bearing upon the character of its course of instruction, which was superior to any other course then offered to pharmaceutical students.

### *Practical Experience in Drug Stores.*

The University of Michigan did not agree with the colleges of pharmacy upon the question of practical experience in drug stores as a requirement for graduation. The writer is, and always has been, convinced that the position of the University upon that question is correct, and ought to prevail throughout the United States as it does in other civilised countries where pharmaceutical education is at present more advanced.

Let us consider the matter in the only right spirit—honestly looking for the truth, willing to see the truth when we find it, and willing to be governed by it when we recognise it.

I have never seen or heard any denial of the truth that no person can be a finished pharmacist until he shall have had sufficient practical experience of the right kind. Practical experience in a good pharmacy, where a sufficient quantity and variety of really pharmaceutical work is done, and where a due sense of the importance of that work and of the responsibility resting upon every one engaged in it pervades the whole establishment, is of very great value, and enough of that kind of experience is a necessary part of a complete course of pharmaceutical training. There is no controversy on this point, for everybody knows and admits its soundness.

### *What Kind of Experience?*

There are, however, radical differences of opinion and practice in regard to the methods employed to secure this practical experience, and we are obliged to concede that no reliance can be put upon the uniform quality of the experience which may be gained in a country where pharmaceutical education is admittedly in its infancy, where the ranks of the druggists are recruited with boys of inadequate preliminary education, where there is one drug store for every 1500 inhabitants, where not one drug store in a hundred has a laboratory of any kind, and where pharmaceutical work constitutes but an insignificant part of the business of a large proportion of the 40,000 stores. At a time when the "colleges of pharmacy" gave no laboratory instruction, the practical experience in drug stores was the only means the student had to depend upon for whatever modicum of skill he could acquire, and it was perhaps natural that colleges without laboratories should require a certain amount of such experience as could be gained.

In Germany, Holland, Russia, the Scandinavian countries, and in several other lands, the drug stores are not general stores, their business is all of it pharmaceutical, they are limited in number, and they all have laboratories. In those countries the apprentices are required to have a fair preliminary education, and the period of apprenticeship or "practical experience" has a far higher value under such circumstances.

### *A Better Grade of Apprentices is Necessary.*

In the United States, however, the enforcement of any number of years' practical experience in drug stores previous to graduation has a decided tendency to operate against the advancement of the standard of education, for the colleges of pharmacy must draw their students from the drug stores, and in the absence of compulsory preliminary education, a large majority of the apprentices and clerks of the drug stores are such as are scarcely fit to successfully pursue such a course of college education as ought to be the rule instead of the exception. This argument is not answered by saying that the colleges should refuse to admit students who are not well enough prepared in "reading, writing, arithmetic," and other common school branches; for if they do refuse such students they will have no classes, and the cause of pharmaceutical education will not be advanced, because the ignoramuses thus excluded from the colleges of pharmacy would nevertheless continue to adorn "the profession." It is undoubtedly true that an intelligent, wide-awake graduate of a university, academy, or good "high school," can learn more pharmacy, and learn it better, in one year than the average drug-store apprentice of to-day in our country can do in four years. There was a good deal of force and truth in what Professor Maisch said on this subject, namely: that the public good, and the good of the pharmaceutical profession in this country are best subserved, not by refusing to admit the ill-educated clerks of the drug stores who were permitted to begin to "learn the business" without having first gone to school long enough, but by admitting them and doing the best we can to instruct them, and thus redeem as many of them as possible since we cannot get rid of them.

### *Intelligent Apprenticeship.*

But the question is not: Shall the pharmaceutical schools undertake to enforce compulsory practical experience in the drug business? Nor is it: Must that practical experience precede graduation? It is broader. The question is: How shall we secure the best apprentices and pharmacists, and the best grade of students? And how can the quantity and quality of "practical experience" which every operative pharmacist ought to possess be best ensured? The answer was given by the Seventh International Pharmaceutical Congress. It is not new, however. It is the re-affirmation of a principle confirmed by extensive experience in other parts of the world. The objects sought are to be secured by legislation establishing compulsory preliminary education, and compulsory intelligent apprenticeship, as a part of the training required of every person who seeks to be licensed as a legally recognised pharmacist. This requires machinery such as no college or school of pharmacy can or ought to provide.

The Pharmaceutical Congress laid down the proposition that "the compulsory period of apprenticeship should not be less than four years, including the time devoted by the apprentice to regular attendance upon the courses of instruction in a college or school of pharmacy."

### *Registration of Apprentices.*

But the enforcement of compulsory preliminary education and apprenticeship can be effected only through a complete and proper system of registration of all persons engaged in doing any pharmaceutical work, or in learning to do such work, in any drug store.

Not only proprietors, managers, and clerks, but the apprentices as well, must be enrolled on a register kept by the State Boards of Pharmacy, and should not be registered until the requirements as to preliminary education have been satisfied, and their period of apprenticeship or "practical experience" should count only from the date upon which they have made application to the Board for such registration, and produced satisfactory evidence that they are qualified to begin their apprenticeship. Such a system has been in force in most of the countries of Europe for a very long time, and it is now in successful operation even in such new countries as Ontario, Canada, and in Victoria and Queensland, Australia. The whole matter must be placed in the hands of the Boards or Commissions of Pharmacy, who should be required by law to enforce these requirements, and who must be provided with the ways and means necessary to that end.

It would be unjust to apply the same rules to persons who may already have entered upon a *bonâ fide* apprenticeship in a drug store. Therefore they must be credited with the "practical experience" they may already have had, provided they are otherwise qualified, and it would be safe and proper also to allow them to qualify by examination in the "English branches" within a given time after the passage of the law. They would in no case be deprived of employment as helpers, or porters, or book-keepers, but would simply be debarred from becoming pharmacists unless they comply with the requirements of the law as to educational fitness.

### *Period of Apprenticeship Shortened by Special Education.*

That "the time devoted to regular attendance upon the courses of instruction in a college or school of pharmacy" should be counted as part of the compulsory period of apprenticeship is obviously a wise proposition. In some countries where pharmaceutical education has received far more intelligent and careful attention for many years, the period of compulsory service previous to licensing is shortened when the candidate has a more advanced college education than the legal minimum.

(*To be continued*).

## RECENT WORK ON ESSENTIAL OILS.*

### CARAWAY OIL.

The investigation of carvol and its derivatives has been continued by Wallach (*Lieb. Annalen*, 275, 110), who, by oxidation of di-hydro-carveol ($C_{10}H_{18}O$) with chromic acid, has obtained a ketone —di-hydro-carvone, $C_{10}H_{16}O$—which boils at 221°-222°, and forms a crystalline combination with sodium bisulphite. The odour of this ketone resembles that of menthone and carvol. Di-hydro-carvone is optically active. A change occurs in the rotation in converting the alcohol into ketone, the dextrogyre di-hydro-carveol becoming lævogyre di-hydro-carvone. With hydroxylamine, dextro- and lævo-di-hydro-carvone yield oximes (which affect polarised light in the same way as their respective ketones) of which the melting point is 88°–89°. On mixing solutions of equal parts of the two active oximes, a new inactive di-hydro-carvoxime, having a melting point of 115°-118°, crystallises out. By boiling di-hydro-carveol with dilute sulphuric acid, terpinene was obtained. Carvoxime heated with the same acid yields carvacrylamine, as well as carvol and carvacrol, and by reducing it with sodium, or by heating carvol with ammonium formiate, di-hydro-carvylamine, $C_{10}H_{17}NH_2$, is formed. This base boils at 220° and has a sp. gr. of 0·885, $n_D$ 1·48168. Dry distillation of its hydrochlorate causes it to split up into ammonium chloride and terpinene. If the same compound be heated with sodium nitrite solution, nitrogen is evolved, and an oil separates which contains di-hydro-carveol as well as appreciable quantities of dipentene. Baeyer (*Berl. Ber.*, xxvi., 820) has, independently, confirmed several of these results and, by acting upon the hydrated iodide of di-hydro-carveol acetate with zinc dust, has obtained the tetrahydro-carveol acetate from which the alcohol, $C_{10}H_{20}O$, was prepared by saponification with potash. This alcohol is a viscous liquid of weak odour and cannot be distilled without decomposition. Oxidised with chromic acid, it yielded tetrahydro-carveol (b. p. 220°–223°), which forms with sodium bisulphite a crystalline compound, and with hydroxylamine an oxime, melting at 99°–101$^{c}$, which by the action of sodium is re-converted into tetrahydro-carveol. The latter, when heated with dilute hydrobromic acid, is converted into a bromide which yields a hydrocarbon—carvo-menthene, $C_{10}H_{18}$—when boiled with quinoline. Carvo-menthene boils at 175°-176°, and combines with two atoms of bromine to form a liquid dibromide. The hydrocarbon formed by reducing limonene di-hydrochlorate with zinc dust is believed by Baeyer to be identical with carvo-menthene.

### BITTER ALMOND OIL, ARTIFICIAL.

It is stated that the belief that benzaldehyde is quite innocuous, and might therefore be used without hesitation for alimentary purposes, has been disproved by Professor R. Kobert, Director of the Pharmacological Institute of the University of Dorpat (Zuriew). In large doses it is said to exercise a powerful action upon the nervous system, but it differs from nitrobenzol in being without action upon the blood.

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* From the *Bericht* von Schimmel and Co. for October.

### CITRONELLA OIL.

The sophistication of this oil in Ceylon is said to have extended remarkably during recent years. The adulterant is usually either a fatty oil (probably coco-nut oil) or petroleum. In both cases the admixture can be detected by well shaking one part of the suspected oil with ten parts of alcohol (80 per cent.), when a clear or feebly opalescent solution, not separating on standing, should result if the oil is pure. Either of the adulterants named, if present, will cause the mixture to be quite turbid when shaken, whilst drops of the added oil will separate out after standing for about twelve hours, the fatty oils sinking and the petroleum floating on the surface. In a recent investigation of the terpenes in citronella oil, Messrs. Schimmel found that a considerable portion of the fraction containing them boils between 157° and 164°. No pinene could be detected in this portion, but with hydrochloric acid the solid hydrochloride of camphene was obtained. This, when heated with water to 100°, split up into hydrochloric acid and camphene (b. p. 159°-160°, m. p. +50°). From this camphene a borneol, melting at 212°, is obtainable. It differs from ordinary borneol, and is considered to be an isomeric compound, being therefore named isoborneol. This may also be obtained from bornyl chloride or from pinene hydrochloride by the same process as employed in the case of camphene. It is suggested that the camphene naturally occurring in citronella oil must be identical with that prepared artificially from borneol. Dipentene was found in the fraction of citronella oil boiling between 173° and 177°, and the melting point of the tetra-bromide is said to be about 124°. An alcoholic body, distilling without decomposition between 231° and 232°, was isolated from the fractions of oil with high boiling points, and identified with geraniol.

### BERGAMOT OIL.

A nitro-bergaptene, $C_{12}H_7(NO_2)O_4$, has been prepared by Pommeranz (*Monats. für Chem.*, 1893, 28). It melts with decomposition at 250° and, on oxidation by means of nitric acid, yields a nitro-methoxy-cumaron-carbonate, $C_{10}H_7(NO_2)O_5$, together with its aldehyde. This solid body melts, with evolution of $CO_2$ and $N_2O$, at 200°.

### EUCALYPTUS OIL.

In the oil of *Eucalyptus globulus*, Bouchardat and Oliviero (*Bull. de la Soc. Chim. de Paris*, ix., 429) have found ethylic and amylic alcohols, together with butyric, valeric, and caproic aldehydes, in the fractions of lowest boiling point. Hirschsohn has discovered a new test for cineol, which appears to be founded upon the formation of a crystalline addition product from cineol and iodol. To about fifteen drops of the oil to be examined, iodol, 0·01 to 0·05 Gm., is added and the mixture shaken. If the iodol does not dissolve more oil must be added, drop by drop, until a clear solution is obtained. Subsequently, according to the quantity of cineol present, well-defined greyish-green crystals separate from the mixture, either immediately or after some lapse of time. On decanting some of the oil and well washing the crystals with petroleum ether, a little solution of potash poured on the crystals causes an intense odour of cineol to be given off. Messrs. Schimmel could not detect cineol by this means when less than 5 per cent. was mixed with oil of turpentine, whereas the bromine water reaction indicated as little as 1 per cent., dissolved in limonene.

### FENNEL OIL.

When fenchone is heated gently with phosphoric anhydride, Wallach (*Lieb. Ann.*, 275, 157) has shown that a cymol is formed, which yields meta-toluylic acid (m. p. 110°-111°) when oxidised with nitric acid. This fact is said to warrant the conclusion that in fencho-cymol and fenchone, methyl- and iso-propyl groups are present in meta position (1·3).

### GINGER OIL.

An investigation recently instituted by Messrs. Schimmel has revealed the presence of camphene in this oil. It is characterised by the iso-borneol formed by it, having a melting point of 212°. Phellandrene was also found in the oil, and the nitrite of phellandrene prepared had a melting point of 102°.

### LAVENDER OIL.

Since oil of turpentine is a frequent adulterant of this product, Messrs. Schimmel have examined genuine lavender oil to ascertain whether pinene is present in it as a natural constituent. It was not traceable in the firm's own distillate, but was found in very small quantity in some French oil. It is suggested that, if a considerable quantity of pinene can be isolated from a sample of lavender oil, the suspicion that the latter has been adulterated with turpentine will be quite justified, especially if the results of the determination of the ester-percentage, specific gravity, optical rotation, and solubility in 70 per cent. alcohol tend to support the suspicion. Cineol has been found in lavender oil by Hirschsohn, and the fact has been confirmed by Messrs. Schimmel. It is present in very minute proportion, and can only be detected with certainty by first decomposing the linalool also present, by heating with formic acid. The presence of a considerable proportion of cineol is said to indicate adulteration with oil of spike.

### ROSE OIL, BULGARIAN.

Samples of otto of rose have been examined by Reformatzky and Markovinkoff, who believe that the stearopten consists of a simple hydrocarbon of the fatty series. This and other results obtained by them are contradicted by those obtained by Eckart and also by Messrs. Schimmel. Eckart's results, on the other hand, have been confirmed by Barbier (*ante*, p. 82), who found the formula of rhodinol acetic ester to be $C_{10}H_{17}O{\cdot}C_2H_3O$, whereas Reformatzky and Markovinkoff give it as $C_{10}H_{19}O{\cdot}C_2H_3O$.

### THUJA OIL.

By allowing bromine to act upon thujone, Wallach (*Lieb. Ann.*, 275, 164) has obtained a crystalline tri-bromide, melting at 121°-122°, with effervescence and dark discoloration. Treatment of thujone with an alkaline bromine solution resulted in the formation of an acid, $C_{10}H_{16}O_4$, melting at 146°-147°, and isomeric with camphoric acid. Thuja-ketone, $C_9H_{10}O$, obtained by dry distillation of the thuja-ketonic acids, may be converted into a hydrocarbon, $C_9H_{14}$, by separation of water. This has been identified as di-hydro-pseudo-cumol. An unsaturated alcohol, $C_9H_{18}O$, was formed on reducing thuja-ketone with sodium. It has a pleasant linalool odour, boils at 185°–187°, and is converted into an isomeric saturated compound, boiling at 149°–151°, by the action of zinc chloride or dilute sulphuric acid. Wallach considers thuja-ketone to be methyl heptylene-ketone and the alcohol, $C_9H_{18}O$, methyl heptylene-carbinol. The saturated combination produced from the latter is probably an anhydride analogous to cineol. A substance, yielding with hydroxylamine an amine melting at 93°–94° and affording a crystalline combination when treated with sulphuretted hydrogen in ammonical solution, was found in the fractions of thuja oil with high boiling points, and is probably inert carvol.

### Wintergreen Oil.

The original oil of wintergreen is said by Messrs. Schimmel to have disappeared from commerce altogether. Distillates from *Gaultheria procumbens* and *Betula lenta* were specially prepared for exhibition at Chicago, and the following figures are given respecting them :—

| Plant Used. | Yield of Oil. | Sp. gr at 15° C. | Opt. Rot. (100 Mm. Tube). |
|---|---|---|---|
| *G. procumbens*<br>Dried leaves ... | 0·7 p. c. | 1·177 | –0° 22′ |
| *B. lenta*<br>Bark ............ | 0·6 p. c. | 1·177 | Inactive |

The synthetic product is also optically inactive, so that oil from the leaves of *Gaultheria* is readily distinguished by this test from both the commercial varieties. All three kinds, when pure, are stated to be almost colourless.

### Mignonette Oils.

Essential oils are yielded both by the flowers and roots of mignonette. The product from the former is of firm consistence, like oil of orris, and has the odour of the flowers themselves. The oil from the root, however, contains sulphur, and has a strongly-marked radish odour. The fresh root yields 0·035 per cent. of oil. It exists in the roots as a separate and definite body, has a sp. gr. of 1·085 at 15°, opt. rot. +1° 30′ (100 Mm. tube). The dried root is odourless and tasteless.

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## APPARATUS FOR PREPARING ANILIN WATER.

Take an ordinary glass bottle or flask, and through the cork insert two pieces of glass tubing, letting one of these go nearly to the bottom of the flask, and the other stop at about the lower end of the neck. Attach a bit of rubber tubing to the external end of the latter tube, and put a pinch-cock on it. When anilin water is needed, the oil is placed in the bottle, distilled water poured on, and the bottle agitated for a few moments. The tubed cork is then put in, and the bottle is hung, neck downwards, on a retort stand, and a small filtering apparatus is placed below it. On opening the pinch-cock, the saturated aniline water flows into the filter, and is collected in a suitable vessel. The residual aniline oil collects in the neck of the flask around the exit-tube, which should be pushed far enough into the flask to prevent any of it flowing out with the saturated water. The other tube serves simply to supply a sufficient quantity of air to insure a steady flow through the exit-tube when the pinch-cock is opened. In this manner there need be no waste of aniline oil, as when the first supply of water is exhausted, more may be added, and the operation repeated until all of the oil has been utilised.—*National Druggist.*

## A NEW SPECIES OF JABORANDI.[*]

### *Pilocarpus microphyllus, Stapf.*

BY T. H. WARDLEWORTH.

In conformity with the promise made at the last meeting of this Association (see *ante*, p. 394), I have much pleasure in submitting the following information about the specimen then submitted. The note, although short, I trust may be found of value to all interested in pharmacy.

The leaves in question were received from Maranham in three bales, and constituted part of a consignment of the ordinary jaborandi of commerce. The brokers on sampling the bales hesitated to offer them as jaborandi on account of their unusual appearance, but ultimately did so, and the lot was promptly sold for shipment.

While possessing the general characteristics of jaborandi, the leaves were much smaller, and the emargination at the apex was most pronounced. The shipper asserted that they were young jaborandi, but as the leaves had every appearance of maturity, the matter appeared worthy of further investigation. Specimens were forwarded to Kew, and the authorities there decided that the leaves belonged to a new and distinct species of jaborandi, to which they gave the name of *Pilocarpus microphyllus*, Stapf, and I have the pleasure of introducing it to you to-night under that name.

*Description of the Drug.*—The leaves are imparipinnate, petiole narrowly winged, articulate at the junction of the leaflets; leaflets ¾ to 1¼ inch long, oblong-ovate, or oblong-lanceolate, cuneate at the base, deeply emarginate at the apex, evergreen, margins entire or faintly crenate, slightly revolute. The leaflets are coriaceous and possess numerous pellucid oil glands.

Histological examination reveals the same structure as other leaves of jaborandi, but the new variety is almost devoid of the stellate hairs on the under surface, which are found in the ordinary varieties.

As you are aware, Mr. Conroy kindly promised to examine the leaves for alkaloid, and I have pleasure in appending his report: "I have examined the small sample of leaves you sent me a few days ago, and have obtained from them an alkaloid possessing all the chemical properties of pilocarpine."

As to their therapeutic value our information is necessarily limited at present, but the shipper states that the infusion makes a powerful sudorific.

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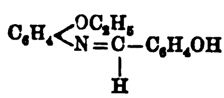
[*] Read at a meeting of the Liverpool Chemists' Association, on November 23.

## MALAKIN.

This is a new substance for which antipyretic and antirheumatic properties are claimed. Malakin, which is allied to phenacetin, is the salicyl derivative of paraphenetidin; its composition is represented by the following formula:—



$$C_6H_4{<}\begin{matrix}OC_2H_5\\ N=\underset{\underset{\textstyle H}{|}}{C}-C_6H_4OH\end{matrix}$$

It occurs in the form of small, light yellow needles, which melt at a temperature of 197°·6 F. Malakin is insoluble in water, slightly soluble in cold, and moderately soluble in hot alcohol. Mineral acids, such as hydrochloric acid, even in 1 in 3000 dilution, decompose it, salicyl-aldehyde and paraphenetidin being formed. The urine gives the salicyl reaction within twenty minutes of the ingestion of the drug.

Its action is that of salicylic acid, the salicyl-aldehyde being changed into salicylic acid in the tissues. The usual single dose is 1 gramme, the amount given in a day varying from 4 to 6 grammes. Owing to its insolubility in water, the drug has generally been given in wafers, but to children or patients who could not swallow wafers it was given in plum or apple jelly. The only complaint made by the patients was that the drug sometimes caused eructations, having a peculiar odour.

The harmlessness of the remedy, especially as regards the circulatory system, having previously been tested in guinea-pigs, it was tried by A. Jaquet (*Correspond. Blatt. f. Schweiz. Aerzte.*) in seventy-four cases, including fourteen of acute rheumatism, thirteen of enteric fever, seven of croupous pneumonia, nineteen of tuberculosis in different stages, seven of erysipelas, two of scarlatina, and twelve of neuralgia and headache.

In the rheumatic cases, several of which were of severe type, the effect was uniformly good; in the febrile cases the fall of temperature was gradual and not excessive, the lowest point being reached in three to four hours; there was no perspiration or collapse; and the effect lasted a considerable time. In the cases of neuralgia the effect showed itself only after one or two hours, and in severe cases the pain was not completely relieved. The drug in such cases is less efficacious than antipyrine.

The following are Jaquet's conclusions: Malakin is a valuable and trustworthy remedy in acute articular rheumatism, its use being unattended with unpleasant secondary effects. He believes that the salicylic acid in the nascent state derived from malakin is effective against the rheumatic poison in smaller doses than when the acid is given in the ordinary way. The slowness and evenness of its antipyretic action make it especially valuable in the case of children and weakly patients. It may be given for a long time in cases of neuralgia and habitual headache without injury.—*British Medical Journal.*

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, DECEMBER 23, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## ŒSYPUS *v.* LANOLIN.

THE trial of the action for infringement of a patent under which a claim is made to the exclusive right of manufacturing cholesterin fat from sheep's wool has now been concluded, and judgment was delivered last Saturday by Mr. Justice ROMER. The manufacturers of "lanolin" claimed to have invented an improvement in its preparation which entitles them to a monopoly in the production of this article. The defendants in the action alleged, in answer to the charge of infringement of the "lanolin" patent, that the hydrous wool-fat sold by them under the name of anaspalin is manufactured from the lye or liquor in which wool has been washed, exactly in the same manner that was described by DIOSCORIDES nearly 2000 years ago, and by other writers since. They also alleged that the process they follow is different from the one described in the specification of the lanolin patent, and that, having been public property antecedent to the date of that patent, the manufacture of wool-fat in that way is not barred by the patent. This appears on face of it to be an obvious conclusion, whatever may be the value of the invention claimed as an improvement in the manufacture of wool-fat, and it is important to mention that Mr. Justice ROMER expressly stated in his judgment that the manufacture of purified wool-fat for pharmaceutical purposes, according to the process described by DIOSCORIDES, is open to be carried out by anyone, notwithstanding the "lanolin" patent. But the dark colour of some specimens made in that way, and the statement made, in explanation of that circumstance, by Professor ATTFIELD, that "he only gradually learnt how to work the DIOSCORIDES process," appear conjointly to have impressed the Judge with the belief that it would be impracticable to obtain a useful product like "lanolin" in that way. Moreover the direct evidence that this can actually be done, and the confirmatory results of the trial, expressly made at the suggestion of Mr. Justice ROMER, being almost entirely ignored by him, this answer to the charge of infringement received but scant consideration. That view of the matter appears to have been too simple to satisfy the exigencies usually associated with the trial of a patent case in the Court of Chancery. Consequently a discursive contest as to the merits of the "lanolin" patent was continued for seven days, with the result of obscuring the facts of the case by a kind of mental mirage, which rendered their true bearing unrecognisable. Little attention was given even to the palpable facts that "lanolin" is neither more nor less than the old œsypus used by the ancient Greeks, and that the revival of the use of wool-fat under the new name was a result of observations having nothing whatever to do with the mode of manufacture.

Though it was assumed that the more recent introduction of wool fat under the name of "lanolin" was the result of a discovery and of a consequent invention, the nature of that discovery was not stated, and the account given of the nature of the invention by the counsel and witnesses for the plaintiffs differed from that given in the specification of the patent. At the trial the main features of the invention were stated to be (1) use of alkali for removing "free fat acids," and (2) incorporation of the purified wool fat with water. The basis for the former statement is purely imaginary, inasmuch as the lye in which wool has been washed does not contain any "free fat acids." It is naturally an alkaline liquid. The claim to the use of a centrifugal machine for separating the wool-fat from the lye or liquor in which wool has been washed was virtually abandoned, though the application of a centrifugal machine for the purpose may be regarded as the one sustainable feature of the patent, inasmuch as that is an improved application of gravity compared with the previously known method of settling. But, notwithstanding the previous knowledge of the process of settling, it was contended by a most extraordinary line of argument that since separation by settling is another mode of applying gravity, it is equivalent to using a centrifugal machine and is, therefore, an infringement of the patent by which the use of a centrifugal machine is claimed. If that were a maintainable argument the old world plan of separating cream from milk might be treated as an infringement of a patent for the use of centrifugal milk separators. As to the second feature of the alleged invention, it was clearly proved at the trial that the incorporation of wool-fat with water is the result of a property common to all kinds of fat, and not in any way due to a newly discovered character of wool-fat. The old œsypus of Dioscorides was wool-fat mixed with water, and in every respect essentially the same thing as that recently introduced under the new name of "lanolin." It is therefore impossible to perceive wherein the alleged invention consists, if the application of a centrifugal machine be abandoned, or in what particular the method of Dioscorides has been improved.

But it was the bogey of "free fat acids" which dominated the entire trial and influenced its result. Taking them to be a substantial reality, Mr. Justice Romer came to the conclusion that œsypus differed from "lanolin" because washing with water would not have removed from œsypus the "free fat acids" supposed to be present in it. It is only in regard to "commercial wool-fat"—which is made by adding acid to the washings of wool, and is used under the name of "Yorkshire grease" for various coarse purposes—that there is any ground for speaking of "free fat acids" in connection with the manufacture or purification of wool-fat. That material is a mixture of wool-fat with about 30 per cent. of free fat acids, which originate from decomposition of the soap used in washing the wool, when acid is added to the washings. If it had been required to separate those free fat acids from the wool-fat, the chemical knowledge of these substances existing for the past twenty years, at least, would have been sufficient for that purpose. It is therefore remarkable that the eminent chemists who gave evidence for the plaintiffs in this case should have professed ignorance on that point, and charged their fellow chemists with a similar deficiency of knowledge. Incidents of that kind do occur in the trial of cases in which questions involving knowledge of science have to be dealt with, and it is matter for deep regret that, in such instances, the proverbially glorious uncertainty of the law is very materially increased. In the case now referred to, the bogey of "free fat acids" and the professed inability of chemists, in 1882, to effect their separation from wool-fat, formed a foundation upon which Sir Richard Webster was enabled to assert that the use of alkali for the purpose constitutes what he represented, with a sort of slaughter-house humour, as the "pith and marrow" of the invention! That view of the matter was accepted by Mr. Justice Romer, and, on that basis, he declared lanolin to have been, in 1882, a "hitherto unknown compound"—that the patent is good, and that it has been infringed by making use of the previously well-known process of settlement by gravitation for separating wool-fat from the ordinary washings of sheep's wool.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

The twenty-third annual ball in connection with this Association is fixed for Thursday, January 18. Any gentleman wishing to take an active part in this popular gathering should communicate with the Hon. Secretary of the Ball Committee, Mr. T. W. Chapman, Bristol Street, Birmingham.

At the annual general convention of Trinity University, Toronto, which opened on Monday, November 13, the degree of Doctor of Pharmacy was conferred upon Professor E. B. Shuttleworth, editor of the *Canadian Pharmaceutical Journal*.

## COMPULSORY PHARMACEUTICAL EDUCATION.

The criticism of a "candid friend" has always the recommendation of being possibly useful if it be honestly meant and otherwise inspired by worthy motives. But the position is one which involves danger that the criticism may not be duly appreciated by those to whom it refers. In the paper recently read by Mr. Martin at the evening meeting of the Society, the weak points of the legislation relating to the practice of pharmacy in the United States and of the system of education existing there have been very freely handled, and we have reason to believe that the views expressed on those subjects will meet with the concurrence of many pharmacists in that country. But it is possible that some of our transatlantic cousins may form a different opinion of Mr. Martin's criticism, and in view of that possibility we have thought the republication of an excellent article by Doctor Oscar Oldberg on compulsory pharmaceutical education as carried out in America would form a fitting supplement to Mr. Martin's paper. The subject treated of is moreover one of such especial interest in relation to the practice of pharmacy in this country and its future development, that a perusal of Dr. Oldberg's article cannot fail to be useful in demonstrating on the basis of actual experience what is desirable to be achieved as well as the dangers to be avoided in seeking to promote a uniform system of education. For the attainment of that object, which has always been the aim of the Pharmaceutical Society, much still remains to be done, and the practical experience gained in the United States will serve as a useful guide in directing procedure in that direction.

## A NEW PHASE OF QUACKERY.

Under the above heading the *British Medical Journal* comments upon an advertisement in the *Standard* by a person representing himself to be "a retired chemist," and offering to furnish "best medical advice" by supplying copies of "the prescriptions of famous West-End doctors" which he has dispensed for years. Copies of these prescriptions "for all sorts of ailments" are to be supplied by the advertiser through the post at the rate of one shilling each. This announcement is very reasonably characterised as being calculated to excite prejudice against chemists and druggists, and to make medical men distrust them as dispensers of their prescriptions. There can be no doubt that such effects may be produced in some instances, and we may add that they would be justified if there were any reason for the opinion that practices such as those indicated by the advertisement in the *Standard* prevailed among chemists and druggists. But we also feel sure that intelligent members of the medical profession recognise the fact that there are throughout the country chemists and druggists who are entitled to the most implicit confidence for their ability and probity. It is understood by them that the condition of the pharmaceutical body is still in process of evolution from a very chaotic state, and that the misdeeds of a few individuals must not be taken as a gauge of the whole. It is in this respect satisfactory to learn that the name attached to the advertisement does not appear in the Register of legally qualified chemists. That circumstance is very fairly pointed out by our contemporary, and we thoroughly agree in the opinion expressed, that it behoves chemists and druggists to take every possible means of condemning and repressing practices which, like that now referred to, tend to bring discredit upon the body to which they belong.

## PATENT AND QUACK MEDICINES.

The Edinburgh Health Society, instituted in 1881 to promote the laws of health generally, arranges for the delivery of annual series of lectures, admission to which is free. The seventh lecture for the current session was delivered on Saturday last by Joseph Tillie, M.D., F.R.S.E., whose subject was "Patent and Quack Medicines." This is a somewhat uncommon subject for a popular lecture, but there is no doubt whatever that it is one upon which the public needs enlightening. The address may now be procured in pamphlet form at a nominal cost, and should prove useful in the hands of those with inclination and opportunity to assist in checking the growth of the monstrous abuse it attacks. Commencing with a historical introduction, Dr. Tillie then defines the words nostrum, proprietary, quack, and patent, as applied to medicine, after which he quotes extensively from the too familiar advertisements advocating secret remedies, classifying them as startling, candid, untruthful, dangerous, etc., etc. Blackmailing advertisements and the responsibility of newspapers in this matter also receive attention. A comparison between proprietary medicines and the official medicines of the chemist and druggist follows, the meaning of the Government stamp is discussed, and, finally, the practice of home-drugging is freely criticised. In an appendix, the approximate composition of many proprietary remedies is stated—that of chlorodyne, by the way, being, though doubtless accidentally, considerably exaggerated as regards its poisonous constituents—and a list is given of the deaths caused by poison in the United Kingdom in the year 1890.

## THE STRAITS SETTLEMENTS.

In the official reports on the protected Malay States for 1892, reference is made to the museum at Perak, the curator of which, Mr. L. Wray, junior, is a corresponding member of the Pharmaceutical Society. Considerable additions were made to the museum last year, and especially to the herbarium, many interesting plants being obtained from the upper ranges of Gunong Inas. Of the two hundred and twenty-two plants collected, most were forwarded to Calcutta, and five new plants have been illustrated and described in Hooker's 'Icones Plantarum.' It is mentioned that the Malays and Siamese preserve flowers by a simple and successful method, placing them in a bottle which is then filled with a hot and moderately strong solution of alum, and at once closed and sealed.

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We are informed that Mr. Edmund Jones, of Miles Bank, Hanley, was on Tuesday last installed as Master of the Menturia Lodge of Freemasons at Hanley. "Menturia" is one of the oldest and largest masonic lodges in Staffordshire, and the installation meeting was largely attended by members and visitors from other lodges.

# Transactions of the Pharmaceutical Society.

## EVENING MEETING IN EDINBURGH.

*Wednesday, December 13.*

MR. J. LAIDLAW EWING IN THE CHAIR.

The second evening meeting in Edinburgh of the present session was held in the Society's House, 36, York Place, on Wednesday, December 13, at 8.30.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Dr. Tillie, Mr. J. H. Fisher, Dunfermline, and Mr. D. B. Dott.

The Assistant-Secretary read a letter from Mrs. Dott intimating that owing to an attack of jaundice, following influenza, Mr. Dott had only been able to write one of the three notes on the billet.

The Chairman said he was sure they all very much regretted Mr. Dott's absence, and trusted he would soon be all right again. In the circumstances, all they could do was to postpone the other two notes till the next meeting.

The following communication was then read:—

### THE TESTS FOR EUCALYPTUS OIL.

BY D. B. DOTT, F.I.C., F.R.S.E.

Eucalyptus oil is a medicament of such value, and the quality of the oil in the market varies so widely, that it is of much importance that proper tests for the purity of the substance should be adopted. Although it is admitted that eucalyptol is the essential constituent of the oil, it by no means follows that the value of the oil varies directly as the percentage of eucalyptol. Not only must objectionable impurities be absent, but something must be allowed to superior fragrance, even although the percentage of eucalyptol should be slightly under that of a less agreeable oil. For our knowledge of the chemistry of eucalyptus oil we are much indebted to the papers* of the late Mr. R. H. Davies and Mr. Pearmain, also to notes† by Messrs. Helbing and Passmore. Of the physical tests, density naturally claims attention in the first place. Speaking generally, the oils of low specific gravity are most deficient in eucalyptol, and are more apt to contain phellandrene and, perhaps, other objectionable constituents. At the same time it would never do to place the specific gravity at too low a figure. Helbing and Passmore suggest ·910 to ·930. I should say ·900 to ·930. There are some good samples, as sample A in table, of specific gravity under ·910. ·930 appears a little extreme on the other side, as it is a rare thing to get an oil of specific gravity above ·920. Yet there is evidently one variety of about ·927 sp. gr., so that it is probably desirable to retain the higher limit of ·930. Experience seems to show that there is not much to be learned by the use of the polariscope in the examination of eucalyptus oil. I do not think that this is an instance in which that useful instrument is of much assistance. If an accurate and ready means were known for the determination of the eucalyptol it would be matter for much satisfaction, as that is manifestly the most important point to be determined. As it is, we have to content ourselves with an approximate method.

The boiling point of eucalyptol being 174°·5 C. (or very near it), and the terpenes present in the oil having lower and higher boiling points, an approximate determination may be made by rectification. By repeated rectification of a considerable quantity of the oil, a fairly accurate result may no doubt be obtained in this way, but such a process would not be suitable as a pharmacopœial test. On distilling, say, 100 C.c. in an ordinary distillation flask, the result differs very sensibly according to the rapidity of the distillation.

Neither is the eucalyptol all contained in one fraction, nor does the fraction of ten degrees or even of five degrees above and below 174·5° consist wholly of eucalyptol. For all that, it is the best test practically available. Probably the best fraction to take as representing eucalyptol is that distilling between 170°-180° C.

This has been shown to yield abundance of crystallised eucalyptol when cooled to a low temperature. Messrs Davies and Pearmain showed that the fraction 180°-190° did not yield crystals when similarly cooled; there therefore appears no reason for the suggestion of Helbing and Passmore that the fraction 170°-190° should be taken as representing eucalyptol. Indeed, I decidedly object to this proposal as tending to form a misleading judgment on the relative merits of different oils. A reference to the subjoined table, as also to those given in the papers above referred to, will show that by taking the fraction 170°-190°, an oil may be made to appear as of much higher relative value than by taking the proper fraction 170°-180°. Further, I do not think that the suggestion to introduce the freezing-out test is at all practicable. It is extremely difficult in ordinary weather to get the temperature low enough to cause any crystallisation of eucalyptol, and equally difficult to determine the exact amount which has so crystallised.

As to the proportion distilling at 170°-180°, which a good oil should yield, I do not think we would be justified in fixing the minimum at more than 50 per cent.

After what has been demonstrated by Messrs. Davies and Pearmain as to the solubility of salicylic acid in mixtures of eucalyptol and terpenes, it seems scarcely worth while to retain the solvent power of the oil on salicylic acid as a test. Miscibility with alcohol is a simpler and equally valuable test. I have tried some experiments in determining the bromine absorption of different oils, but not sufficient to be able to recommend it as a general test. Broadly speaking, the best oils have least absorptive power for bromine. Iodine absorption is not a convenient process. The nitrous acid and bisulphite tests for phellandren and aldehydes are no doubt of much importance, although I have not found any samples which I have examined in recent times to give distinct reactions with either reagent. Of a large number of samples which I have examined during the past five years, I give the results of the following six:—

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Sp. gr. | ·9087 | ·9115 | ·9144 | ·9130 | ·9123 | ·9177 |
| 100 C.c. of each distilled. | | | | | | |
| Below 170° | 18·8 | 33·0 | 5·0 | 25·5 | 17·3 | 18·6 |
| 170°—180° | 58·0 | 57·2 | 69 0 | 64·3 | 59·3 | 56·9 |
| 180°—190° | 11·6 | 5·2 | 12·6 | 6·6 | 13 6 | 13·9 |
| Above 190° | 11·1 | 4·4 | 13·3 | 3·5 | 9·3 | 10·5 |
| | 99·5 | 99·8 | 99 9 | 99·9 | 99 5 | 99·9 |

The Chairman said this was an important note at the present time in view of the prospective issue of the new British, or rather Imperial British, Pharmacopœia. It was desirable that full and definite information should be available in the compilation of that work.

Mr. Stephenson said he agreed with the Chairman as to the value and opportuneness of this communication. Eucalyptus oil was undoubtedly of high medicinal value, and it was most important that a definite test should be laid down for it in the Pharmacopœia. He had seen some samples which had a distinct odour of turpentine, and he thought these were quite inadmissible for use in medicine. Mr. Dott's experiments had evidently been conducted with great care, and could be accepted as reliable.

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* 'Year-Book of Pharmacy,' 1891, 465; 1892, 388.

† *Pharm. Record*, Nos. viii. and x.

Mr. Lunan said the average specific gravity of the samples examined by Mr. Dott agreed pretty closely with that of the new U.S. Pharmacopœia, namely 0·915. He thought the phellandrene test should be inserted in the Pharmacopœia. It was very much to be desired that they should have some simple test that could be applied by any ordinary retail pharmacist.

Mr. Coull said the test proposed by Mr. Dott was a very good approximate one. He would like to ask if Mr. Dott regarded the fraction between 170° C. and 180° C. as consisting entirely of eucalyptol. The salicylic acid test was suggested as a means of detecting turpentine, but that was attained by the raising of the specific gravity standard, and therefore the salicylic acid test could be discarded. He had got the phellandrene reaction with several samples, but they were all *E. amygdalina* oil, which was the only one giving the reaction. In the 1885 Pharmacopœia the source of the oil was stated as *Eucalyptus globulus* and other species, and that had given a quite undue prominence to the *E. globulus* oil. It was supposed to be the best because it was put in front of the others. It would be better to name some other species in the Pharmacopœia, such as *E. oleosa* or, as it is now called, *E. cneorifolia* and *E. dumosa*.

Mr. Hill said he quite agreed with Mr. Dott that the percentage of eucalyptol should not be regarded as fixing the relative therapeutic value of the oils. Many samples containing high percentages of eucalyptol had a very disagreeable odour, and were not so serviceable as others containing a sufficient percentage and possessing the additional advantage of a pleasant odour. He thought it was necessary, too, to have some better information as to whether eucalyptol was really the active constituent of the oil. He did not think that had yet been conclusively shown. The absence of terpenes which caused irritation when inhaled seemed to be as important as a high percentage of eucalyptol. It would also have been interesting to have known the sources of Mr. Dott's samples. Something had been done by Bosisto and Maiden in describing the oils yielded by different species of eucalyptus, but it still seemed desirable to do more work on thoroughly authentic specimens, which were very difficult to get, and to determine which variety or varieties yielded the oil best fitted for therapeutic use. With regard to the samples spoken of by Mr. Stephenson, he had seen several such of German origin, but he thought there was little doubt that they had been deliberately adulterated by the addition of turpentine. In reply to Mr. Coull, he might point out that Mr. Dott stated in his paper that the fraction 170° to 180° C. was not exclusively eucalyptol, but consisted mainly of eucalyptol, and contained practically all that was in the oil.

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The next communication was a

## NOTE ON ACIDUM CARBOLICUM LIQUEFACTUM, B.P.

BY PETER BOA.

Liquefied carbolic acid has always been troublesome by reason of its crystallising in cold weather. Previous to the appearance of the current Pharmacopœia it was customary to prepare it by using 9 parts of carbolic acid and one part of water. The Pharmacopœia defines it now as "carbolic acid liquefied by the addition of 10 per cent. of water." This increase in strength rather tends to aggravate than lessen the trouble. Whenever the temperature of the pharmacy falls below 50° F. crystallisation may be expected. The suggestion has been made, if I remember rightly, by Mr. Lunan, in a discussion in this room, that the quantity of water should be increased. This suggestion is reasonable and may be ultimately adopted. There is always in my mind, however, a reluctance to alter any strength that has been in use for many years if the difficulty can be removed in any other convenient way. For some time I have been replacing a portion of the water by rectified spirit with good results. 100 parts carbolic acid, 7½ parts water, and 2½ parts rectified spirit give a liquefied carbolic acid that remains fluid in the shop bottle till the temperature falls to about 40° F. A larger proportion of spirit does not appear to serve the purpose better. When this liquefied acid containing 2½ parts spirit in place of 2½ parts of water crystallises, the resulting mass is less hard and much more easily re-liquefied than the mass which results on crystallisation when water only is used to liquefy; it is as snow compared to ice. I offer the suggestion in the hope that it may be the means of lessening the inconvenience at present experienced with this preparation in cold weather.

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Mr. Nesbit said this suggestion was a very useful one for getting over the trouble caused by crystallisation, but he had not met with that difficulty.

Mr. Stephenson said his experience coincided with that of Mr. Nesbit. He found no difficulty in keeping the acid in a liquid state.

Mr. Lunan said he had met with the same difficulty as Mr. Boa, and thought it was due to the degree of hydration and the purity of the acid. If they used an acid melting above 33° C. in making the liquefied acid it would not keep fluid when cooled below 50° F. He had used both the detached and the agglutinated crystals, and the latter were less liable to crystallise than the former. For some time he had been in the habit of using two fluid ounces of water to every pound of carbolic acid. That was equal to about 11 per cent., and it kept well. The U. S. Pharmacopœia defined the acid as having a boiling point lower than 188° C. and a melting point of 33° C. With an acid of such purity crystallisation would be very liable to take place, and he thought Mr. Boa had made a valuable suggestion.

Mr. C. F. Henry said he would like to ask if Mr. Boa had tried glycerin.

Mr. Duncan said he agreed with Mr. Lunan that the crystallisation was caused by the greater purity of the acid. If an acid consisting of crystals in a state of deliquescence were used crystallisation would be retarded. Glycerin was quite inadmissible, as the acid was more apt to crystallise than in water, due, probably, to the dehydrating effect of the glycerin. He had tried some experiments of the same kind as Mr. Boa, but substituted rectified spirit for the whole of the water. The effect was that crystallisation was not materially lessened, and he thought Mr. Boa had hit the mark by substituting spirit for only a portion of the water.

Mr. Coull said one objection to the use of spirit would be the expense.

Mr. Hill said he had frequently heard complaints as to the trouble arising from the liquefied carbolic acid being found in a crystallised condition at the moment it was required, and this suggestion would be useful as a means of obviating this difficulty.

Mr. Boa, in reply, said apparently some had not been troubled as he had been with this preparation. His pharmacy was sometimes at 38° F. in the morning, and at that temperature the B.P. liquefied carbolic acid was in a hopeless condition. He had not tried glycerin, partly because it was objectionable from messing the outside of the bottle and also because carbolic acid was much less soluble in it than in alcohol. The fact that the purer the acid the greater the tendency to crystallisation was a strong argument in favour of some such device as he suggested, because they naturally endeavoured to use the purest acid obtainable. The question of expense was a small matter from a retail point of view. He showed them two bottles, one with 2½ parts of spirit in place of water and the other with 5 parts of spirit in place of water. They had been subjected to a very low temperature, and they would see that crystallisation had proceeded further in the latter case than in the former. He therefore thought a substitution of 2½ parts of water by spirit was the best proportion to adopt.

The last communication was on

### SOME BAZAAR DRUGS FROM BURMAH.

BY ALEXANDER SUTHERLAND.

The author gave a very interesting description of the free and easy way in which business is carried on in an oriental bazaar, and referred to the absence of any restriction on the sale of poisonous drugs, which are freely exposed alongside of harmless herbs and even ordinary articles of food. He then exhibited and described a large number of the commoner drugs of vegetable origin which he had collected from the bazaars during a residence in Rangoon. He gave a description of the character and uses of the more important ones, and in doing so drew attention to the extensive prevalence of the doctrine of signatures. The specimens included a sample of star anise as generally sold in the bazaars, which on examination was found to be a mixture of the fruits of *Illicium anisatum* and *I. religiosum*; the pith of *Aralia papyrifera*, used in the making of so-called Chinese rice paper and a set of pictures illustrating tea manufacture painted on sheets of *Aralia* or rice paper; a specimen of black *Aconitum ferox* root, a variety said to be steeped in cow's urine, giving it a strong and persistent hyraceum-like odour, used for poisoning tigers, probably the *Teliya Báchnág* of oriental writers; and specimens of red, white, and black seeds of *Abrus precatorius*, the white variety being used as a standard of weight by the Burmese.

The Chairman said he would like to ask Mr. Sutherland what had been his experience of the use of opium in Burmah. He had received a letter recently from a friend in that part of the world, who said he was in the habit of giving a regular supply to his workmen, and found it had a beneficial effect as a prophylactic against malarial fever.

Mr. Sutherland said the opium question in Burmah resembled the drink question at home. The sale of opium was a Government monopoly and a source of considerable revenue. One marked difference was that an opium eater or smoker, unlike a liquor drinker, never got violently intoxicated, and never disturbed his neighbours or assaulted his relatives. He was usually stowed away in some obscure corner till he recovered. One never, therefore, saw much, or indeed any of it in the streets or in any public place. There was no doubt, however, that it was a degrading practice, and was so regarded by the people themselves. The chief way in which this degradation revealed itself was in the form of petty thefts. The person who had acquired a taste for opium would do anything to procure it, and after recovering from a debauch would steal anything he could lay hands on to get a few pice to purchase a further supply. This was about the only way in which the opium devotee annoyed his friends and neighbours. So far as he could judge, the use of the drug appeared to be on the increase. He believed opium was used largely by some tribes, especially in India, as a preventive of malarial fever, and apparently without injurious effects, but he did not know on what ground such a use of the drug was based.

On the motion of the Chairman a cordial vote of thanks was awarded to the authors of papers.

Owing to the lateness of the hour the description of recent additions to the Museum, by the Assistant-Secretary, was postponed to a future date, and the meeting then closed.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The opening meeting was held on Thursday, November 23, the President, Professor Attfield, F.R.S., in the chair.

The proceedings commenced with the following

### INTRODUCTORY ADDRESS.

BY F. RANSOM.

Gentlemen,—In accepting your invitation to address you to-night, I thank you for the honour which you have done me, and I am pleased to have the opportunity of expressing my appreciation of the work already done by your Association, and my desire that its usefulness may continue to increase. As a former member I can testify to the interest it inspired amongst those of us who were students in the earlier days of its existence, and I feel no doubt that similar conditions will produce the same results during the present session.

An association of this kind is useful in many ways. Besides tending to promote the main objects of its existence, to which I shall refer later, the meetings, in drawing together those whose interests are in common, afford students opportunities of intercourse which are not available to the same extent during working hours. Here you will have the opportunity of cultivating those powers of debate which, whether active or latent, you all doubtless possess to a greater or less extent. The power of publicly expressing your opinions in appropriate and clear language is an accomplishment which is certain to prove of value in later years if you take any active share in the duties and responsibilities of life. The appointment of a Committee, whose duty it shall be to bring before the Association reports of recent work in pharmacy and the allied branches of science, is calculated to be of great benefit both to the reporters themselves and also to the other members of the Association. To be able to grasp the main points of some lengthy and perhaps abstruse original work, and to so condense it as to form an intelligible and reliable abstract, is also an accomplishment which requires practice, but which fully repays the expenditure of time and trouble bestowed upon it. It is one thing to read through a paper full of minute details and references, but quite another to carry away and be able to explain to others the salient points of the communication. It is in these days quite impossible to read through every paper that may appear even in one branch of science. Hence we are largely dependent upon abstractors, who by a process of judicious selection enable us to assimilate some portion of the knowledge continually being given to the world by scientific workers.

But the main object of your Association, as stated in the prospectus, is "to promote study and original work in chemistry, botany, materia medica, and other branches of knowledge allied to pharmacy." Study necessarily precedes all original work, and according to the methods adopted in study and the diligence with which it is carried out, will depend largely the value of any research which may afterwards be attempted. The study which this Association is intended specially to promote is somewhat more specific in character than that which is included in the course of education provided by the School of Pharmacy. Sooner or later all of you who prosecute your studies further than the mere exigencies of a pharmacist's life demand, will probably have to select some one branch of science upon which to devote special attention. Specialists are the natural outcome of extended knowledge and of an increased area of investigation. True there are some men whose range extends into various fields of science, and who appear simultaneously as acknowledged authorities on widely separated subjects. Such men, however, are the exceptions, and most specialists, while possessing a good general knowledge in all kindred subjects, will find it necessary to devote most of their energy to the one branch which they have chosen. To discover the line of work for which each is best adapted by circumstance and ability is of great importance, and your Association offers special facilities in this direction. Natural inclination will often prove a guide of some value, but it is only after some work has been done, and perhaps some disappointment experienced, that you will be able to decide definitely in which direction you are likely to meet with most success. The earlier that this decision can be arrived at the better it will be. The preparation of a paper for this Association on some special subject which has attracted your interest, or a report upon current work in one of the branches of science already alluded to, may do much towards assisting you to arrive at a right conclusion. If you decide on some special subject, make it your business to search all the literature relating to it which has been published both in text books and journals. It is a good practice to make short abstracts of the published papers as you come across them. It will tend to impress the facts upon the mind, and they will prove useful for reference as you continue your work. Make a point, when possible, of referring to the original papers of the investigator, and of not relying entirely upon published abstracts, which may omit important details. In order to carry out this rule fully, some knowledge of German and French is of course necessary, and happy are those students whose earlier education has given them a fair acquaintance with these languages. A French scientific paper is much more easily translated than a French novel, and in German, although the length of some technical words may at first appear formidable, it will generally be found that they are merely combinations of short and easily translatable words, which give much more indication as to their meaning than the English equivalents. Carefully note any points on which authorities appear to differ, and follow as closely as possible the experimental work of each which leads them to different conclusions. By working practically on the subject you will become acquainted with it more intimately than would be possible by mere reading. If the results of an investigation on which you may be engaged do not at first appear satisfactory, do not be disheartened. Even if at the termination you do not find your material sufficiently new or definite for publication, the time spent upon it has not been lost. The experience will have been of value if it has only been the means of practising the powers of observation and manipulation, and of exercising the mental faculties. Keep your notes, and they may not improbably prove of value in the future. It is also encouraging to remember that many of the most important discoveries in science, especially in chemistry, have been made by accident. In following a course of investigation there is always the possibility that you may chance to strike upon something of even greater value than that of which you were in search.

Although I would certainly not discourage study prosecuted simply for the purpose of acquiring knowledge which shall be useful in the duties of the everyday life of the pharmacist, I would nevertheless strongly urge that when possible the acquired knowledge and experience should eventually also be used for original research. We are often exhorted so to spend our lives that we may leave the world better than we found it. Let us also attempt to leave the world a little wiser than we found it by adding something, it may be but little, to some branch of knowledge. There is a special attraction in traversing new ground in any subject, and those allied to pharmacy offer exceptional opportunities and promise of large reward. In materia medica, for instance, how scanty often is the information to be obtained from textbooks of the actual constituents and active principles of many common drugs. Take, for example, such a frequently used drug as digitalis. Although many bodies have been isolated from it, we cannot say with any degree of certainty which, if any, of these possesses the full activity of the leaf. Many years ago an article termed digitalin was introduced and received official recognition in the British Pharmacopœia, but it has now been rightly discarded. Not being a definite compound it was found to be unreliable in action, and no substitute has been discovered. Digitalis leaves are admittedly variable in strength, and a pure body representing the full activity of the drug is a desideratum. Veratrine, again, is described in the present edition of the British Pharmacopœia as "an alkaloid or mixture of alkaloids obtained from cevadilla, not quite pure." Here, therefore, is a tacit acknowledgment that our present state of knowledge of the drug cevadilla is not sufficiently advanced to give us a process for obtaining definitely the pure active principle. Many other instances will readily occur to all where our knowledge of the chemistry of a common drug is at present purely elementary. Even opium yields a new alkaloid to investigators almost perenially, while chemists are still discussing whether and, if so, under what conditions belladonna contains atropine. Reliable methods of assay are much needed for many common drugs, and should follow the determination of the active principles. A further knowledge in this direction would greatly facilitate the introduction of standardised preparations, and thus tend to ensure constant action in cases where at present the strength is variable. Amongst less common and newly introduced drugs the field for investigation is still wider, and the prospects equally, if not more, promising.

Although probably you will not at present find time or possess the necessary experience to prosecute any elaborate research in materia medica of the nature that I have indicated, there will doubtless be opportunities for less ambitious original work. Reference was made by your President at the last evening meeting of the Pharmaceutical Society to the work which might be conducted by students belonging to this Association, and any who are willing to undertake this may be sure of advice and assistance. The examination and comparison of trade samples of crude drugs and their preparations is a kind of work which might be easily performed, and is likely to result in useful reports. The determination, for example, of the percentage of resin in the roots of jalap, scammony, and podophyllum, as now met with in the market, would certainly prove of interest. Podophyllin itself varies much in appearance, and samples would probably yield very different results with solvents. Euonymin, both brown and green, might be examined for the percentage and character of the contained resin, and compared with the official dried extract. The histology of drugs is a subject which has recently been brought prominently into notice by a paper from Professor Greenish. As a means for the detection of adulterations it is doubtless of great practical importance, and deserves much more attention than it has usually received from students. An intimate acquaintance with the use of the microscope and its accessories, and a practical knowledge of the appearance and characteristics of vegetable tissues, are of course essential before any useful work can be accomplished in this direction.

In botany there is a promising field for the investigator and much interest and pleasure for the less advanced student. A pharmacist, especially if he reside in the country, is usually regarded more or less as an authority on the flora of the neighbourhood. He should know the local habitats of all plants of special interest or rarity, and should be able to recognise flowers brought to him for identification. A pursuit of this description not only does much to relieve the monotony which is supposed to be attached to the ordinary routine of a chemist's business, but it raises him in the estimation of his fellow-townsmen. A man who can talk intelligently of the articles in which he trades, and who also shows some general knowledge of the laws and phenomena of nature, is likely to create more confidence, both in the medical profession and amongst the public, than he who does his duties mechanically and only possesses that knowledge and experience which the law demands for the protection of his customers. In botany, as in other subjects, I would suggest that, if possible, having acquired the more general knowledge, a specific study in some special department should be undertaken. Take, for instance, one natural order; collect and carefully preserve typical specimens of all species that you can find, and note all variations from the type that may come under your observation. Both algæ and fungi offer points of special interest to the student. Take, for example, the widely distributed group of algæ known as diatoms, of which many thousands of species have already been recorded. Their minute siliceous cuticles, when cleaned and mounted, form most beautiful objects for the microscope, while their life history and the power of independent motion possessed by many species afford interesting material for study and speculation. Another large and most important group of microscopical plants, the bacteria, has during recent years received much attention. The connection of these organisms with disease brings them into close contact with the practice of medicine, and here, therefore, is a subject which has just claims upon the pharmacist. Some knowledge of them may rightly be expected from every well educated chemist, and if by perseverance and ability he gain sufficient experience to work practically upon the subject, no more promising field for original research could be suggested. Probably no recent discoveries in science have done so much to prevent and relieve human suffering as those resulting from the study of bacteria. They have suggested scientific methods in the treatment of disease which have largely replaced merely empirical remedies. This suggests the relation of the pharmacist's calling to matters connected with health and sanitation. As the knowledge of the life history of these germs of disease becomes more complete, the possible sources of their conveyance and the conditions favourable to their growth receive greater attention. In the case of an epidemic the pharmacist should be able to second the efforts of the medical man in educating the public as to the necessary precautions to be taken, and should be able to advise as to the disinfectants which he will be called upon to supply. He should also know something of the antiseptic method of the treatment of wounds, and be able to discuss intelligently the various surgical dressings which now often form so important a part of his stock in trade.

As students of the School of Pharmacy and as members of this Association, you will have exceptional opportunities of making a good start as scientific pharmacists. Although for the present your course of study must be largely directed towards the requirements of the examinations, I trust you may find some time for work that may appear to be outside the examination syllabus. You can never be sure that you have thoroughly grasped a subject up to a certain point until you have actually worked rather beyond that point. Then, and not until then, by using the knowledge you have acquired as the basis upon which to work, you will be able to detect flaws and apply practical tests for the thoroughness of such knowledge. Having passed the examinations you will be wise, if possible, not to rush at once into business, but to devote at least a few months to further study. The Research Laboratory provides the opportunity of undertaking investigations which may not only prove of much value in themselves, but which will provide the necessary training for the prosecution of future original work. There is some danger that a student may place too much importance on the passing of the Major; he may consider that it not only gives the right to a diploma, but that it also indicates his qualification for undertaking advanced work in chemical or botanical research, for which he is really not competent. The result may be that he may bring discredit both on himself and upon the pharmaceutical body at large. The fact is, so far as my observation goes, that very few of those who obtain the Major qualification are really sufficiently experienced to undertake work of this description without further guidance, and I am positive that in every case a few months' more training, such as may be obtained here, cannot fail to be of distinct benefit. I would remind you that there is now a title bestowed by the Pharmaceutical Society which is an honourable distinction for any pharmacist, and while paying due attention to the requirements of examinations let it be your aim to become not only pharmaceutical chemists but also Research Fellows.

Finally, gentlemen, let me remind you that the most valuable of all talents is that of perseverance or the power of steady application to any work that is undertaken. It is a talent which is peculiarly susceptible to treatment; by careful cultivation it may be largely developed and do much to compensate for the lack of what are regarded as the more brilliant gifts of genius, while if neglected the power may almost vanish and nought can take its place. If you wish to succeed in life, if you wish to make a mark in the honourable profession which you have chosen, use all the talents with which you are endowed, but above all cultivate that power of application and concentration of energy without which complete success is impossible.

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At the conclusion of the address a vote of thanks to Mr. Ransom was proposed by the Chairman, seconded by Mr. W. S. Crouch, and carried by acclamation.

The election of officers for the coming session was then proceeded with, Messrs. H. Boyce and A. E. Marsh being appointed scrutineers; the result was as follows:—Vice-Presidents, Mr. T. Tickle and Mr. E. Brooke; Secretary and Treasurer, Mr. F. W. Short Assistant-Secretary, Mr. E. H. Gane; Executive Committee, Messrs. A. T. Hill, T. A. Henry, E. L. N. St. Cyr, and C. E. Ashby.

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## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, December 7, the President, Mr. E. F. Harrison, in the chair, the following paper was read:—

### THE PHARMACIST AS A MAN OF SCIENCE.

BY C. M. LUXMOORE, B.SC., F.C.S.

A pharmacist I conceive to be a man who, after sufficient study and adequate training, has been pronounced by the body duly authorised on that behalf to be qualified as a pharmaceutical chemist. Pharmacy, I wish to remind you, is not a science, it is an art. Like some other skilled branches of labour, the due performance of its operations necessitates a not inconsiderable acquaintance with several branches of pure science; but pharmacy itself is just the art of elaborating the outputs of Nature or the products of manufacture into medicaments suitable for administration to the human being or to other animals.

Then when one speaks of science, that is, as it is sometimes called, pure science, I suppose it is generally understood that one connotes by that term knowledge in its various branches viewed in itself, and not in any of its numerous and fruitful applications. I accordingly regard as a man of science one by whom science is esteemed for its own sake, one whose desire to know is not conditioned by the material advantages that may flow from that knowledge. Indeed, if you like and understand me aright, I may say an amateur, or at any rate an *amator*, a lover of knowledge for its own sake.

These points, then, being premised, it will follow at once that the relationship between the pharmaceutical calling and the pursuit of science is certainly not a casual one. No man will ever be a man of science because he is a pharmacist. The pharmacist may be a man who has passed through a first-class school of pharmacy, diligently attending all the lectures, carefully perfecting himself in all the practical work, receiving deserved commendation from his teachers, obtaining medals and prizes. He may pass his Minor and Major examinations with credit, and be fully competent to do all that pertains to a pharmacist to do, and yet not be a man of science in any sense whatever. I do not mean to belittle such a man. A most worthy citizen he may be, and into his hands would I most confidingly place any prescription I might require dispensed. I simply desire to point out that the most unexceptionable training which a pharmacist can receive does not make him a man of science.

In the study of science the embryo pharmacist is gathering from the past labours of scientific men that information which is calculated to help him in the intelligent and satisfactory pursuit of his vocation. Whether he is listening to lectures and storing his mind with facts and with principles wrested by others from Nature's secrets, or whether he is in the laboratory, or working with his microscope, he is simply learning the same things in another way. Of course I speak of the teaching of science; together with this he is taught much of art, and I could wish (but it is, perhaps, somewhat outside to-night's subject) that in the schools of pharmacy science and art were more markedly separated than is at present the case. My conception of the matter is that whatever else he has to learn, a pharmaceutical student must devote a goodly share of his time to the study of pure science.

Now, that which I am anxious to present to the notice of the Chemists' Assistants' Association this evening is this: If there be in a man a veritable longing after the acquirement of science, a real desire to know what there is in Nature to be known, it seems to me that the vocation of pharmacy offers to him very notable facilities for the pursuit of his desire. And, indeed, while I have entitled my paper the "Pharmacist as a Man of Science," the considerations I have to bring before you are clearly applicable *mutatis mutandis* to the pharmaceutical student.

I may first take a few examples from physical phenomena to make clear my meaning, and I shall be satisfied if any are led as the result of my evening's converse with you to stimulate their faculties of observation and of correlation as they pursue the conduct of their daily duties.

It will, I think, be found on consideration that the varieties of matter of which the generality of mankind have experience are somewhat limited. Of course everybody has some little experience of some one or more of the things that are handled daily in every pharmacy, but several phenomena that one may meet with constantly in the routine of pharmaceutical work are scarcely ever, probably never, seen by the bulk of the community. For instance, most pharmacists will remember, I expect, the first time when they had to put, say, spirit of camphor into a bottle, and used a wet one; perhaps if it was not very wet they, though much concerned at the milkiness first produced, went on putting it in almost unconsciously, and were much relieved to find the milkiness presently disappear. How many considerations this might suggest to a truly scientific mind! How clearly here are given indications of the balance that obtains when three such substances co-exist in one solution! If you put the spirit of camphor into a very wet bottle the camphor is precipitated, and will not re-dissolve, but if you put a small quantity into a considerable amount of water and shake vigorously, solution is again complete. Now mix your spirit of camphor with, say, a couple of volumes of alcohol, and you find its range of solubility in water is very much increased. The student of pharmacy may be uninterested in all this; the student of Nature observes it, varies the conditions, inquires the cause, and discovers for himself how varied and yet how truly regular are the conditions of phenomena.

The subject of the miscibility of liquids, whether they be simple substances or solutions, is, I think, extremely interesting.

It is a common observation with us that all matter is divisible into three states, solid, liquid, and gaseous. To the general public the idea conveyed by the term liquid is only that it is something of a watery nature, and the only distinction they would make would be between watery and oily liquids. This artificial division, although a sharp one, into unlike classes, is not so marked to the pharmacist, who is familiar with the gradual passage from oily fluids to aqueous, for oil is miscible with ether, ether with alcohol, and alcohol with water; and so a common erroneous notion is corrected for the pharmacist in his everyday work.

At first all substances were classified according to their apparent qualities, and even now you hear of stone ammonia being asked for, presumably because it is hard, and spirit of ammonia, perhaps because it is odorous and volatile. Pharmacists do not pay attention to such arbitrary systems of classification, but gauge a substance rather according to its solubility and the properties of the resulting solution. It is most probable that the history of chemistry as a whole, and the formation of ideas on chemical matters in an individual, follow much the same general lines, and if so, how favoured is a pharmacist, whose surroundings are so eminently favourable to accurate because broadly based generalisations.

A pharmacist's apprentice may even learn many facts, if he is of the turn of mind for so doing, whilst dusting. Why does water clean the neck of the bottle containing solution of sulphate of magnesia and not the tincture of guaiacum one? and why does spirit or alkali remove the resinous matter from the latter? and, further, why can the resin be recovered from the spirit used and not from the alkali? These are all problems to the apprentice. Again, why will some liquids froth more than others? This the apprentice soon learns is due partly to the strength of the spirit used.

There are different "whys;" in the instance of a deposit in the tincture bottles, the apprentice wants to know why it is there; the assistant wants to know "why," because he made the tincture and cannot account for it, perhaps; the proprietor wants to know "why," because of the loss occasioned.

Habits of accurate weighing and measuring should be familiar to every pharmaceutical worker. True the dispensing scales in actual use may not turn to a hundredth part of a grain, but the worker, if a good worker at all, knows what they will turn to. Considerations of business probity prevent his weighing ½ grain strychnine on scales which will scarcely turn to ½ grain. But how few have clearly in their mind the approximation to accuracy which they actually attain? I fear, perhaps, in this respect the pharmacist allows himself to take a lower rank than he need. My impression is that pharmaceutical students might take a lesson from men who are learning mechanics engineering in these matters. It seems to me, just to wander for a moment from my subject, that when a man has dispensed a prescription in which, for instance, he had to give 32 grains KI in an 8 ounce mixture, of which ⅛ is to be taken for a dose, he ought not only to weigh his KI and measure his mixture with customary and appropriate accuracy—he ought also to be able to say within what limits of error the dose will be taken under ordinary conditions. He ought to know, first, how much error his weighing, etc., allows in the total quantity, whether he is certain it is between 31½ and 32½ grains. Then, how nearly the total is really 8 oz. If it is put into a marked bottle, what are the measures of the greatest and least divisions, and so on, not necessarily measuring every bottle, but having preliminarily found out the average accuracy of the bottles. Such a pharmacist not only knows that he has dispensed 4 gr. doses, but can tell the prescriber within what limits 4 gr. is likely to be the quantity taken.

Perhaps pharmacists would be better chemists if they had a better grasp of matters of weight, *i.e.*, mass and measure. How much confusion there is still as to grains and ounces. Many will doubtless complain, not without cause, against the system. But it may, at any rate, be argued that, on the one hand, a man who cannot or will not master this difficulty has very little in him, and, on the other hand, that the exercise afforded by these difficulties and anomalies is excellent practice. I am not prepared altogether to endorse this argument, but undeniably there is something in it.

Let me, then, impress on members of this Association the immense advantages and opportunities which a man of any scientific proclivities may find in the practice of pharmacy, and thus seek to stimulate them to increased use of their powers of perception and of reasoning. Brightly have the annals of science been illuminated by the masterly researches of men like Scheele in the past and Tilden in later times. Greatly have they been enriched by the useful work of many less notable men from the ranks of pharmacy. These are the glorious traditions of your calling. It rests with the present generation, it rests with you, gentlemen, to say—shall they be maintained?

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In the discussion which followed the reading of the paper, the President said he did not think it needful to restrict the term science to pure science, for applied science was justly entitled to it, and it was not the less science because it was used for our material advantage. The greatest scientists had begun by studying little things, and by so doing men were far more likely to obtain knowledge than if they started with the express intention of making a discovery. Men soon find out which they were best suited to, and consequently carried out their studies in either pure or applied science. It was a difficult matter to trace the time when we first began to understand what science is, and when awake to our sense of consciousness of the fact we were apt to deplore the amount of wasted time and lack of incentive to make us work.

Mr. Tickle thought science ought not to be valued so much for its own sake as for its use when applied, for it was not the fact first noted by Stephenson that steam was capable of doing work that had benefited mankind, but its application.

Mr. Jowett pointed out the value of the powers of reasoning and observation, and thought science of particular aid in developing them. It was a singular fact that most of the great discoveries were made by amateurs. Darwin was an amateur, and only obtained his knowledge by his capability of observing and reasoning out facts.

Mr. Gane said the average pharmacist did not want science, they learnt too much; it was business training they wanted, for science was of little value in aiding men to earn a livelihood; the present day required men to have "go" in them, otherwise they were not successful in business. They lived at too high a pressure to have time to wait and consider the advantages to be gained by using a proportionate quantity of a solution of a salt instead of weighing each quantity separately.

The President then rose to propose a vote of thanks to Mr. Luxmoore, which was carried with acclamation, and Mr. Luxmoore, in thanking the members for their attention, said that he always meant pure science when he spoke of science, and applied science he always called art. He might illustrate the relation that existed between science and art by one of Newton's laws, which stated that "action and reaction are equal and opposite."

# Provincial Transactions.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

A meeting was held on Thursday, the 7th inst., Mr. Frank Walker, President, in the chair. Mr. Walker said his attention had been called to a mixture containing sod. salicylat. and ammon. acet., which had developed a red colour. It was suggested that this might have been caused by the dispenser using sod. salicyl. containing cresotic acids, which in some solutions soon changed colour. Mr. Wokes quoted the following as an uncommon combination:—

℞ Conf. Terebinth.................... ...℥ss.
Syr. Pruni. Virg........................℥i.
Aquam ad...............................℥viii. M.

Mrs. T. S. Wokes then delivered a lecture on—

### SPONGES, THEIR STRUCTURE AND LIFE HISTORY.

It has now been definitely proved that the sponge is an animal, as it contains no cellulose and requires organic food. It is a compound body, and the sarcode, or living part of the sponge, appears to the eye as a soft gelatinous substance, which, however, is seen by the microscope to consist of an aggregation of simple animals possessing an endoderm, ectoderm, and mesodermic layer. This living portion is supported on a horny skeleton (the commercial sponge) which is composed of a substance called keratode, spongin, or keratin, chemically allied to silk. Most sponges possess some kind of skeletal structures. They may be either calcareous or siliceous or horny scleres, the latter usually having the form of fibres, which sometimes enclose siliceous needles (stipules) or foreign bodies. Foreign bodies sometimes form part and sometimes the entire sponge skeleton. The spicules of calcareous sponges consist of carbonate of calcium. Each spicule, so far as its mineral component is concerned, is a single crystal. On the other hand, its general structure is organic. Its surfaces are curved, and it usually has the form of a cone or combination of cones, each of which consists of concentric layers of calcite surrounding an axial fibre of organic matter, and can be readily seen by removing the calcite with a weak acid. Spicules may be obtained by cutting sponge into thin slices and soaking it in liquor potassæ to dissolve the horny skeleton. Siliceous spicules consist of colloid silica or opal. Spicules differ greatly in form, size, and use. They may be divided into two groups: minute or flesh spicules, supporting a single cell, and larger or skeletal spicules, contributing to the formation of skeleton. In some sponges the scleres are simply scattered through the mesoderm, and do not give rise to a continuous skeleton. British sponges contain a lot of siliceous matter. The crater-like openings on the top of sponges are osculæ or exhalent apertures, and the very small holes in the sponge are the pores or inhalent apertures. The simplest sponge we know consists of a flask-shaped body with a large internal cavity and one crater-like opening at the top. It is covered with pores, through which the water is absorbed and ejected from the terminal crater. On dissecting it we find canals running through it from the surface to the central cavity. Here and there in these openings we find dilatations, each of which is lined with cells having hairs pointing outwards, called ciliated chambers. These are for breathing purposes, by directing the water into currents. The presence of one or more contractile vacuoles in flagellated or ciliated cells suggests that they extricate water, urea, and carbonic acid. Also, this current provides food for the sponge in the form of particles of animal and vegetable matter, which are absorbed by the sarcode. The sarcode, or living outer and inner glutinous covering of the sponge skeleton, is possessed of a rudimentary nervous system which enables it to close the pores and suspend the processes of inhalation and inhibition.

Fresh individuals arise by a sexual gemmation, by fission, and by true sexual reproduction. In the latter case the new individuals are produced from the union of ova and spermatozoa, which develop from wandering amœboid cells in the mesoderm. The little gemmule thus formed is a yellowish capsule covered with cilia, and is ejected from the oscula, floats away from the parent sponge, and attaches itself to any suitable neighbouring object, as a stone or rock, where it grows. Artificial fission has been practised with success in the cultivation of sponges for the market by the Italian Government, but the experiment had to be abandoned on account of the hostility of the sponge fishers. Experiments were also made on the American coast.

Mrs. Wokes then described in a lucid manner the method of artificial cultivation and the different methods of sponge fishing, as diving, harpooning, trawling, etc., and also the different varieties of sponges sold for toilet and other purposes, and their preparation for the market. A description of various foreign and British sponges followed, including Euplectella, the beautiful Venus's flower-basket, and the Chinese glass-rope sponge, which has a long string of glass-like spicules attaching the sponge proper to the mud from which it grows. British sponges are small and, from an economic point of view, valueless, but very interesting to the naturalist. The principal varieties are *Chalia oculata*, *Halichondria romosa*, and *Halichondria panicea*, or crumb-of-bread sponge.

The lecture was accompanied by limelight illustrations from slides lent by Professor Herdman.

A hearty vote of thanks brought the meeting to a close.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

A meeting of the above Society was held on Wednesday, December 13. The President, Mr. G. T. W. Newsholme, occupied the chair. The minutes of the previous meeting were read and adopted. Mr. Morrison notified that he had received from the Pharmaceutical Society about 140 specimens for the museum. It was proposed by Mr. Newsholme, and seconded by Mr. Ward, that the best thanks of the Society be sent to the Pharmaceutical Society of Great Britain for this donation. Mr. Henry Davy, of Worksop, was elected a member of the Society, and the Chairman then called upon Mr. Alfred H. Allen for his lecture, entitled "Eyes and Dyes." The lecturer illustrated by a number of beautiful experiments the prismatic decomposition of white light and the absorption spectra of various coloured media, including coloured glasses, dyes, blood, etc. He pointed out that yellow was not a primary colour, as it could be made by combining red and green light, while no combination of yellow and blue lights would produce green, but always white light. The green of the artist was due to the fact that green was substantially the only shade reflected in common by the yellow and blue pigments employed in compounding the green; all the other colours were absorbed by one or other of the components, the green alone surviving. The effect of colour on the vision and the subject of colour-blindness were also fully treated. Mr. Ibbitt, in moving a vote of thanks, commented on the importance of correct colour-vision in pharmacy. He regarded it as probable that among the future tests of the Pharmaceutical Society would be an examination as to whether one colour could readily be distinguished from another. Mr. Rhoden seconded, and Mr. Ward supported the resolution. The Chairman then put the vote to the meeting, and Mr. Allen returned thanks for the hearty vote accorded to him, after which the meeting terminated.

## SUNDERLAND CHEMISTS' ASSOCIATION.

The annual dinner of the members of the Sunderland Chemists' Association was held at the Grand Hotel, on Wednesday, December 13. Ald. Thompson, J.P., occupied the chair, Messrs. R. Robinson and J. Mitchinson the vice-chairs, and the others present were:—The Mayor (Councillor J. Sanderson, J.P.), Councillors W. Sanderson, H. J. Turnbull, J. Harrison, L. Thompson, Ranken, and Fowler, Majors Barker and Peacock, Messrs. C. Ranken, F. Ranken, Robinson, R. N. Bartram, Peacock, Hall, C. Bell, Askew, Porter, R. T. Watson, Pumphrey, G. P. Fairman, R. H. Bell, A. O. Bell, T. Walton, Mitchinson, W. J. Todd, W. Hudson, Cherrett, Hodgson, H. J. Turnbull, jun., A. O. Purse, Leadbitter, Hedley, R. White, and H. A. Brown. Under the able management of Mr. W. Hall an excellent dinner was provided.

After dinner a long toast list was very expeditiously gone through. The loyal toasts having been given with musical honours, Mr. Mitchinson proposed "The Army, Navy, and Reserve Forces," to which Majors Barker and Peacock responded. Mr. Robinson next gave "The Mayor and Corporation of Sunderland," to which the Mayor responded. Councillor Ranken proposed the health of the borough magistrates, to which Councillor Sanderson, J.P., responded, and Councillor Turnbull proposed "The port and trade of Sunderland," to which Mr. W. R. Bartram responded.

Alderman Thompson then gave the toast of "The Pharmaceutical Society of Great Britain," and coupled with it the name of the local representative, Councillor J. Harrison. In proposing this toast, Alderman Thompson aired a chemist's grievance, which he said he had now harped upon for a great many years, namely, the dispensing of prescriptions by medical men. He strongly maintained that doctors should prescribe only for their patients, and that the chemists should make up the prescriptions.

Councillor Harrison, in responding, remarked that about fifty years ago the Pharmaceutical Society was formed chiefly for the promotion and study of pharmacy and chemistry, for the promotion of a system of education amongst chemists, and for the provision of a benevolent fund. He then proceeded to show how, in a great measure, these objects were fulfilled, and, in conclusion, urged those present to subscribe as liberally as possible towards the Benevolent Fund, quoting cases which had come before the meeting of the Society in London, which showed the great help the annuity grants were to members who fail in business in their old age.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

A well attended smoking concert in connection with the above Association was held at the Colonnade Hotel, Birmingham, on Thursday, December 14, Mr. C. Thompson, President, in the chair. The large room of the hotel was full, and the following gentlemen assisted in the musical part of the programme:—Messrs. Perry, Chapman, Cartwright, Thompson, Turton, Child, Brown, Page, Burton, Meggeson, Homer, Chaddock, Lovegrove, Lunbury, and Scott.

## LIVERPOOL CHEMISTS' ASSOCIATION.

The last meeting of the year was held at the Royal Institution on Thursday, December 14, Mr. J. Hockin, President, in the chair.

Dr. Symes referred to the scheme for the federation of local associations. Since the matter had been introduced at one of the general meetings, and referred to the Council, the Council had met, and, though he (Dr. Symes) was not present, had appointed him to represent the Liverpool Chemists' Association. He felt great interest in the question, and was willing to accept the office. Organisations got up for special purposes had been known to fail, but from the earnestness and determination shown by the originators of this scheme he was convinced that it was bound to succeed. A paper was then read on "Artificial Febrifuges," by Mr. Edward Davies, in which the author pointed out the analogies existing amongst these compounds, and showed how they served as examples of complete artificial organic structures.

# Parliamentary and Law Proceedings.

### POISONING BY LAUDANUM.

Mr. E. B. Reece, district coroner, on Monday, December 11, at the Cardiff Town Hall, held an inquest touching the death of Henry King, who was found dead in bed at 62, St. Mary Street, on the previous Saturday, and appeared to have met his death by taking an overdose of laudanum.

Dr. Roche said he made a post-mortem examination of the body. From the condition of deceased's brain it seemed as if he had been taking opium. He was of opinion that deceased died from the effects of narcotic poisoning.

Alfred Coleman, chemist, St. Mary Street, said a man answering the description given to him of the deceased called at his shop on Friday, and bought a two-shilling bottle of laudanum.

The inquest was adjourned till the following day, when the jury gave a verdict of *felo de se*.—*Western Mail.*

### POISONING BY OXALIC ACID.

Mr. H. G. Doggett, city coroner, resumed, at the Bristol Royal Infirmary, on December 13, his inquiry into the circumstances attending the death of Abraham George Brown, 38, a cab-driver, living at 6, High Street, Durdham Down, who died on November 27 from the effects of a dose of oxalic acid. When the inquest was opened it was adjourned in order that the contents of the stomach of the deceased might be analysed. At the adjourned inquiry evidence was given showing that on November 27 the deceased brought home two small packets, labelled "Purified Epsom Salts, R. J. Troake, 126, White Ladies' Road." These, he said, he had bought of Mr. Troake, and he took a dose, consisting of about half the contents of one packet. He was immediately taken very ill, and died as he was being removed to the Infirmary. The post-mortem examination and the analysis revealed the fact that death was due to oxalic acid poisoning.

The Coroner, in reviewing the evidence, said it was obvious that death in this case was due to oxalic acid poisoning, and the question for the jury to consider was how it found its way into the packet, and was there any negligence on the part of any person in allowing it to get into the packet, and if so, who? If there was any culpable negligence, the person responsible was guilty of manslaughter.

The jury retired to consider their verdict, and after considerable deliberation, they returned the following verdict:—"That the deceased man died from oxalic acid poisoning; that the oxalic acid poison was sold to him by mistake for Epsom salts from Mr. Troake's shop, but there is no evidence to show how such mistake arose."—*Bristol Times and Mirror.*

### POISONING BY CYANIDE OF POTASSIUM.

An inquest was held at Sidcup on the body of Alexander Maas, German clerk, on Tuesday, December 12. Mr. E. N. Wood, the deputy-coroner for West Kent, presided. The deceased had been accused of fraud, and was subsequently found lying on the floor of a room in his house, breathing very heavily.

Dr. Shapley said the post-mortem examination showed that the deceased was a finely developed man, and died from the effects of poison, probably cyanide of potassium.—*Morning.*

### POISONING BY CYANIDE OF POTASSIUM.

Joseph John Hague, a surgical instrument maker, at 75, Pentonville Road, who for some time past has been very intemperate, was found lying in bed unconscious on Wednesday, December 13, with a small case of morphia capsules beside him, three of which were empty. In a letter, which was read at the coroner's inquest on the following Friday, he said: "I am now going to take an overdose of morphia, and if that is not enough I shall finish with cyanide."

Dr. F. Milburn stated that he used the stomach pump and tried every possible means of keeping the deceased alive, but he expired within a few hours of witness's arrival. An autopsy showed that Hague had carried out the intention described in his letter, and, finding morphia ineffective, had taken a dose of cyanide of potassium.

The jury returned a verdict of "Suicide while of unsound mind, induced by habits of intemperance."—*Morning Leader.*

### POISONING BY ARSENIC.

An inquest was held on Wednesday, December 13, before Mr. Samuel Craddock, coroner for North Somerset, at the George and Dragon Inn, Felton, on the body of Charlotte Thatcher, aged 35 years, the wife of Mr. William Thatcher, a farmer, of Felton. About five o'clock in the evening on Monday, on Mr. Thatcher returning home, he found his wife lying dead on the stairs. On a post-mortem examination it was found that the woman had taken arsenic. The jury returned a verdict that the deceased committed suicide by poisoning herself during a state of temporary insanity. —*Bristol Mercury.*

### POISONING BY OVERDOSE OF LAUDANUM.

Dr. G. Danford Thomas held an inquest at the Islington Coroner's Court, on December 14, concerning the death of George Manning, aged 51 years, a machine minder, lately residing at 17, Camden Street, N.W., which took place on Saturday last.

Harriet Manning, the widow, stated that her husband had been out of regular work for two years, and had been very much depressed in consequence. Three weeks ago, at his request, she purchased twopennyworth of laudanum, and on Friday she obtained threepennyworth more, which he said was for a friend. When she awoke on Saturday morning at nine o'clock she found that he had taken the whole of the smaller quantity, and she thereupon threw the remainder on the fire and gave him an emetic with success. He did not recover, and at five o'clock in the afternoon she told the landlady, and she sent for two doctors, but they arrived too late to be of any use.

Dr. John Walter Smythe stated that he was called to the deceased, who was in a comatose condition. His pupils were extremely contracted, and death, which was due to laudanum poisoning, took place shortly after his arrival.

The jury returned an open verdict, and censured the widow for not sending for a medical man earlier. —*Morning Advertiser.*

### Child Poisoned by "Infant's Preservative."

The Derby coroner held an inquest at the Town Hall, on December 13, on the body of William Johnson, aged four months, son of Emma and Henry Johnson, of 50, Norman Street.

From the evidence it appeared that the child, who was insured, was taken ill on Sunday, the 10th inst. A doctor was consulted, and the mother was also recommended to get some "preservative" from Mr. Hart, chemist, Sadler Gate. She did so, but it did the child no good, and on Monday morning it seemed to be unconscious. She then took deceased to Dr. McKay, who found it was suffering from narcotic poisoning, and he prescribed for it. The following day, however, it died, and the doctor refused to give a certificate. He found that the "preservative" contained compound tincture of camphor.

The coroner adjourned the inquest in order to make inquiries.—*Nottingham Daily Guardian.*

### Poisoning by Laudanum.

On Monday, December 8, Mr. T. H. Stanley, the Walsall borough coroner, held an inquest at the Elephant and Castle Inn, Wolverhampton Street, touching the death of John Kendrick, aged 75, of Hollyhedge Lane, who was found dead in bed on Friday. It was shown that the deceased, not being used to taking opium, took an overdose of laudanum. The jury returned a verdict of "Accidental death through an overdose of opium."—*Midland Counties Express.*

### Inland Revenue Prosecutions.

#### ILLEGAL USE OF A STILL.

Messrs. Zechariah Heys and Sons, calico printers, South Arthurlie, Neilston, were at the Paisley Justice of the Peace Court, on Friday, December 15, fined the nominal penalty of one guinea for having on their premises at Barrhead kept and used a still without having a licence. It was explained that the apparatus was used to obtain absolute alcohol from methylated spirit for testing dyes, and that similar stills were to be found in the laboratories of analytical chemists generally, who never thought of taking out licences for them, as they were used for experimental purposes.—*Scotsman, and Evening Citizen.*

#### SALE OF METHYLATED SPIRIT WITHOUT A LICENCE.

On Saturday, December 16, at Horncastle, Henry Lunn, chemist and grocer, was summoned by the Inland Revenue for selling methylated spirit without a licence. Mr. Yeoman, supervisor of Inland Revenue, appeared in support of the information.

Charles Gibney, officer of Inland Revenue, stationed at Lincoln, proved the case.

Defendant pleaded that it was purely an inadvertence, and that he did not know until recently that he required a licence to sell methylated spirit, and that as soon as he did so he took out the necessary licence.

A fine of £1, including costs, was imposed.—*Nottingham Daily Guardian.*

## Reviews and Notices of Books.

### The Out-Door World, or Young Collectors' Handbook. By W. Furneaux, F.R.G.S.*

Though primarily intended for boys, this book cannot fail to rouse the greatest interest in anyone with the least taste for natural history. Commencing with the assumption that the acquirement of the habits of collecting, preserving, and studying natural history objects cannot fail to keep a youth out of mischief, while tending to keep his body in health, and to train his mind, the author presents a mass of useful information in a most attractive guise. The contents are classified under three headings—animal life, the vegetable world, and the mineral world. The subject-matter of the first section usually presents most attractions to embryo naturalists and, accordingly, receives most attention in the present work. In the opening chapter the young naturalist is strongly and wisely recommended to go pond hunting. Instructions are given describing how the apparatus required may be readily improvised, and the stocking and management of an aquarium are practically explained. The methods by which insects, reptiles, fish, birds, and mammals may be found, captured, preserved, and studied, are thoroughly and practically described, illustrations being furnished wherever desirable to render the letter-press descriptions clearer. Sea-weeds, fungi, mosses, ferns, grasses, flowering plants, and forest trees then receive attention, and, finally, minerals and fossils are briefly treated of. It would, of course, be impossible within the limits of such a book to deal with any of the subjects at great length, and systematists may find occasion to object to many matters of minor detail. The author has, however, wisely avoided the dry-as-dust element, and must be congratulated upon having well accomplished the task he set himself to do. The sixteen coloured plates and five hundred illustrations in the text give the book a greatly increased value. The written descriptions will be found clearly and concisely put, and sufficiently detailed and accurate generally for the purpose. As the author remarks in his concluding paragraph, the possession of commodious cabinets, well filled with a great variety of natural objects of all kinds, and a facility in the rapid enumeration of their long Latin names, do not in themselves constitute the qualifications of a true naturalist, the one essential being to know all one's specimens—to be acquainted with their real character, and the part played by each in the realm of Nature.

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* London: Longmans, Green and Co. Pp. i.-xxviii. 1 to 411. 7*s.* 6*d.*

## Obituary.

Notice has been received of the death of the following:—

On December 7, James Dunkerly, Chemist and Druggist, of Leyton. (Aged 69 years). Mr. Dunkerly was for many years a member of the Society.

On December 8, William Harrison, Chemist and Druggist, of Kirkby Lonsdale. (Aged 74 years).

On December 11, Tom Sellers Higgins, Pharmaceutical Chemist, late of the firm of Wheatley and Higgins, of Huddersfield. (Aged 64 years). Mr. Higgins had been a member of the Society for forty years.

On December 13, William Wood, Chemist and Druggist, of Pontypool. (Aged 78 years).

On December 14, Samuel Gower, Chemist and Druggist, of Wombwell. (Aged 57 years).

On December 19, Frederick Ashley Cooper, Chemist and Druggist, of Cockermouth. (Aged 37 years.) Deceased was an associate in business of the Society.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### China and the Opium Trade.

Sir,—As a medical man, who has seen a great deal of the effects of the opium habit in China, and who has studied the opium question very closely, I should like, for the sake of your readers, to add a few sentences to those which have already appeared on the subject in your columns. First, I am entirely at one with you that the market for medicinal opium must be supplied, and that if our supplies from Turkey are in danger of failure, it would be well to look to India to meet the need. Of the thousands of medical men who have deliberately condemned the opium trade there are none who would not readily join with you in this position. But there is all the difference in the world between the cultivation of opium for medical uses and the opium trade as it now exists. The present opium trade has nothing to do with medical uses, but solely with the use of opium for eating and smoking. And what we know of the opium habit in this country applies to the millions in China for whom our Indian Government deliberately prepares its immense opium stores. All its opium is especially prepared for the smoker. It can, indeed, be used for medical purposes, for when my supply of Turkish opium has failed, I have in China purchased a ball of Indian opium and used it readily in medicine, but that is not the use intended by the Indian Government. Now, we know, many of us, what laudanum drinking in this country implies, the physical and moral debasement produced by the terrible grip which it takes, and the hopelessness of deliverance from its bondage. There are none of us, I dare to say, who would not sacrifice a great deal to save any son or daughter of ours from falling into such a vice. But the effects of opium in China are like the effects of opium here. In six months I have had as many as 250 Chinese coming to me praying for help to get rid of the opium habit, and in a period of ten years you can readily understand how vast a mass of misery and evil from this cause it was my lot to see. The grip of the opium habit in China is like the grip of the opium habit in England, and I have yet to hear of any practitioner in this country who would dare among any company of medical men or pharmaceutists to propose that the sale of opium should be put on the same footing as the sale of beer, or spirits, or tobacco. In South China tobacco is universally used, but no Chinaman ever dreams of comparing its use with that of opium. All that we claim is that our Government in India shall not make itself the minister of vice, but that it will fence round the sale of opium in that country as it does in this, that it will label as poison there what it insists on labelling as poison here, and that it will cease to be the instrument in preparing an element of such widely extended destructiveness in China. I will not attempt to follow Mr. Lay in his pleadings for the opium trade from India. He knows as well as I do that from 1782 till 1840 it was a smuggling trade. He may attempt to elude that ugly word "smuggling" and the violence so often associated with it, but surely Mr. Donald Matheson, one of the merchants concerned in the trade, and one of the men kept in durance by Commissioner Lin in 1839, till all the opium then in Chinese waters was surrendered, knows better than either he or Sir Thomas Wade whether it was a smuggling trade or not. And though Mr. Lay may characterise as quite untrue the statement that "ever since the war of 1841, China has been compelled to admit our opium," the common sense of mankind will persist in saying that it is true. The Viceroy, Li Hung Chang, in 1881, placed on record an authoritative statement, and with it I close. "Opium is a subject in the discussion of which England and China can never meet on common ground. China views the whole subject from a moral standpoint, England from a fiscal. England would sustain a source of revenue in India, while China contends for the lives and prosperity of her people. . . . The present impost duty on opium was established not from choice, but because China submitted to the adverse decision of arms. The war must be considered as China's standing protest against legalising such a revenue."

*49, Highbury Park, N.* JAMES L. MAXWELL, M.D.

### A Suggestion.

Sir,—As the time when we are likely to have an enforced curriculum seems somewhat distant, I would suggest that a law be passed that three years should elapse between the date of passing the Preliminary examination and permission being given to attempt the Minor.

*San Remo.* FRANK R. SQUIRE.

## Answers to Correspondents.

*John Woodhouse.*—Your letter has been handed to the College of Preceptors.

*W. H. Burrell.*—The first-named brand is usually regarded as the original one, but as regards the respective merits of the products of different manufacturers, that is purely a matter of individual opinion.

## Books, etc., received.

Dictionary of the Active Principles of Plants. By Charles E. Sohn, F.I.C., F.C.S. Pp. i.-vii., 1 to 194. 10*s*. 6*d*. London: Baillière, Tindall and Cox. From the Publishers.

Twenty-Fourth Annual Report of the State Board of Health of Massachusetts. From the Secretary.

Patent and Quack Medicines. By Joseph Tillie, M.D., F.R.S.E. Being No. VII., Series 12, of "Health Lectures for the People," delivered under the auspices of the Edinburgh Health Society. Pp. 38. 2*d*. Edinburgh: Macniven and Wallace. From the Author.

A Text-Book of the Physiological Chemistry of the Animal Body; including an Account of the Chemical Changes Occurring in Disease. Vol. II. The Physiological Chemistry of Digestion. By Arthur Gamgee, M.D., F.R.S. With two chromo-lithographic charts by Spillon and Wilkinson. 8vo. Pp. i.-xx., 1 to 528. 18*s*. London: Macmillan & Co. From the Publishers.

Communications, Letters, etc., received from Messrs. Hill, Ingham, Kinninmont, Pratt, Sage, Shenstone.

## THE AMOUNT OF MORPHINE IN EXTRACT OF POPPY.

BY DR. B. H. PAUL AND A. J. COWNLEY.

Although the preparations of poppies are included in the poison schedule of the Pharmacy Act, the British Pharmacopœia does not indicate the strength of any one of them, and in Squire's 'Companion' the only clue to the strength of these preparations is the statement that the medicinal properties of poppy capsules are similar to opium, but weaker, and of uncertain strength. Having had occasion to examine some samples of extract of poppy, we have been struck by the great difference in the amount of morphine present in that preparation, and have thought it may be useful to publish the following results of our analyses of five samples obtained from wholesale druggists.

| Sample. | Morphine. Per cent. |
|---|---|
| No. 1 | 0·72 |
| „ 2 | 1·34 |
| „ 3 | 1·61 |
| „ 4 | 0·77 |
| „ 5 | 1·14 |

A sample of extract made in the laboratory according to the directions of the B.P. was found to contain 1·34 per cent. of morphine, and on the assumption that the whole of the alkaloid is extracted from poppy capsules by the treatment with water, the amount contained in the capsules, deprived of seeds, was 0·28 per cent.

In regard to this point a statement was published some time since that E. Merck had given the amount of morphine in poppy capsules as 2·0 per cent. On reference to the original paper it appears that the statement above mentioned was incorrect, for the quantity of morphine obtained by Merck from 32 ounces of capsules was 18 grains, or about 0·12 per cent. That amount would approximately correspond to the strength of the three samples of extract, Nos. 1, 4, and 5, unless the yield of extract from poppy capsules is also subject to variation. In the case of the samples Nos. 2 and 3, the amount of morphine in the capsules from which they were prepared would have been more than double as much, and nearer to that found in the poppy capsules used for making our laboratory sample of extract. Syrup of poppies made from these capsules would contain rather more than half a grain (0·564) of morphine in the fluid ounce. But when made from poppy capsules, without reference to the amount of morphine they contain, it is evident that this preparation is liable to be twice as strong in some instances as it is in others.

## COMPULSORY PHARMACEUTICAL EDUCATION IN AMERICA.*

BY DR. OSCAR OLDBERG.

*Dean of the Illinois College of Pharmacy.*

(*Concluded from page* 504.)

### *Educational Institutions Cannot Properly Assume Responsibility for the "Experience" in Drug Stores.*

No college of pharmacy can properly undertake to enforce a compulsory apprenticeship or period of practical experience in drug stores even in the case of its own graduates. Yet we find not only that a majority of these colleges include it among the requirements for graduation, but we have seen diplomas which expressly declare that the holders have had the experience required. Such a requirement by any school or college, and especially such a declaration in the wording of its diploma, must be regarded as of no value unless that school or college is prepared to control or determine, and does, in fact, take the necessary steps to ascertain the value of, said practical experience, and is willing to be responsible for it as being in reality sufficient to entitle the graduate to confidence by reason of it. Therefore, it follows that any college of pharmacy which requires of its students, as a condition for graduation, that they must have had three or four years' experience in drug stores, thereby pledges itself to see to it that the kind of experience each graduate has had was of such character as to justify the importance attached to it. How can any college, careful of the faithful performance of its obligations—not merely in the literal sense, but in every other proper sense as well—accept any such responsibility, or extend any such guarantee? Have the candid, sincere friends of pharmaceutical education ever thought of the matter in that light? A college can and should know its own duties and work, and be held responsible for its courses of instruction, its teachers, and all its own acts, but no careful institution of learning should be willing to go outside its own proper functions by unnecessarily assuming any responsibility whatever for matters which are altogether beyond its ken and control. The enforcement of the requirement of a proper apprenticeship certainly belongs to the State Boards of Pharmacy and not at all to any school or college.

### *Shall Practice Precede Theory, or the Reverse?*

The question whether or not the apprenticeship in the drug store should precede or follow the college course in pharmacy is, under the present conditions in this country, a question of no great importance. There are some reasons why two or three years' previous experience in a well-appointed, busy, and well-conducted pharmacy will considerably help the student in his college course; and there are equally good reasons for the belief that a college course in pharmacy, previous to the apprenticeship in the store, must be even more helpful to the apprentice. Indeed, from actual observation and experience, I believe that, as things pharmaceutical are at present, it is decidedly better for all parties concerned that the student of pharmacy should take his college course first.

But the University of Michigan, in its excellent School of Pharmacy, gives a two years' course, and makes that course far more comprehensive than any before attempted. For this reason higher educational requirements for admission are necessary than any considerable number of drug clerks and apprentices can satisfy. Therefore the University very properly and wisely ignores the question of experience in drug stores as one which ought not to be permitted to stand in the way of higher education, and it does not confer the same title upon its graduates as that conferred by the previously established schools of pharmacy, but has adopted an entirely new and distinctive one. Moreover, the institution is ever careful to state in its annual announcement that practical experience in drug stores is not required of its graduates.

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* From the *Apothecary*, September, 1893.

### *What is a College of Pharmacy?*

In 1871, the "colleges of pharmacy," through their representatives in the American Pharmaceutical Association, unanimously resolved, almost without any previous deliberation, that an institution not controlled by pharmacists and not including "practical experience" in drug stores among its requirements for graduation is not a college of pharmacy such as that Association could consistently recognise! The school against which this declaration was directed gave a course of instruction much more extensive and valuable than that given in any other pharmaceutical school at that time; it required its students to devote their whole time to their school work; it demanded high educational qualifications for admission; it was the first to introduce obligatory laboratory practice; and it had a corps of professional teachers devoting their whole time and attention to their duties as such. All other pharmaceutical schools at that time in existence were giving from three to six lectures weekly to their students, and no other instruction whatever; their students were actively employed in drug stores, on their feet all day except when they took their meals; and, after this fit preparation, received their instruction in full doses just before bed-time; there were no educational qualifications for admission; these colleges had no laboratories; and their teachers, like their students, devoted but a very small portion of their time to their school work, and all the remainder to other business.

It is impossible not to believe that the gentlemen who adopted that view of the situation were perfectly honest and sincere; but it is equally impossible to believe that they had given the matter sufficient consideration.

### *Must Pharmaceutical Schools be Governed by Druggists.*

Will any experienced educator, or any broad-minded pharmacist who will think the matter over, maintain that an institution not controlled by pharmacists can not be a good college or school of pharmacy in every proper sense? Are all the schools of pharmacy of the Universities of Europe to be regarded as not entitled to recognition by the American colleges of pharmacy controlled by pharmacists? Are the schools of pharmacy of the American Universities less intelligently or well conducted, or less thorough, than other American colleges of pharmacy? Are the druggists of Philadelphia, New York, Boston, Baltimore, Chicago, St. Louis, Cincinnati, or Louisville necessarily to be regarded as more experienced and wise in the solution of educational problems, and in conducting schools, than are the officers of government and instruction in our universities? But—this question may be safely left to take care of itself.

That an experienced pharmacist with a well-trained mind can render valuable counsel in regard to the practical instruction which students of pharmacy should receive, no one will deny. On the contrary, several of the International Pharmaceutical Congresses have emphatically declared that at least one of the chairs in the faculty of every school which teaches classes of pharmacists should be occupied by a pharmacist who has had practical experience as such, and it is readily and generally admitted that the general direction of pharmaceutical courses of instruction ought to be participated in by one or more pharmacists of sufficiently broad education and extensive and varied experience in pharmaceutical work. But the American pharmaceutical schools and colleges controlled by pharmacists have no warrant for claiming superiority over the schools not controlled by pharmacists.

When we consider that any person, without regard to previous condition or education, can become a drug clerk (not registered) or apprentice, and in some States even a proprietor and manager of a drug store, that no proper system of registration of clerks and apprentices exists, that in proportion to the number "in the business" there are still very few persons who are graduates in pharmacy and not too many good schools of pharmacy considering the educational work that remains to be done by them, that there is very little evidence of a satisfactory condition of pharmaceutical knowledge in the pharmaceutical journals, papers, and discussions, and that there are to-day, as twenty-two years ago, comparatively few members of the profession who have such a liberal education that they are able and willing to take much broader views of these matters than have so far prevailed, we are, indeed, constrained to believe that pharmaceutical education in our beloved country, great as it is, must still be regarded as in its infancy.

### *Uncertain Value of Examinations.*

The pharmacy laws prescribe that candidates for registration and licence must be examined by the boards of pharmacy to test their fitness, or that they may be exempt from such examination if graduates. Yet not one of these pharmacy laws contains any definite directions as to the scope which the examination should cover, nor the least suggestion as to what constitutes such a course of college instruction as should be accepted in place of the examination. "Materia medica, botany, chemistry, and pharmacy" may mean much or little according to the individual opinion of the examiner. The questions actually used in State board examinations have frequently been published, and are still accessible in the files of pharmaceutical periodicals, which were formerly in the habit of publishing such trash. If we are to judge from these questions, there could have been no definite idea in the minds of the examiners as to how much or what kind of botanical and chemical knowledge, or how much or what kind of knowledge of materia medica, or pharmacy, the candidate should be required to possess. Some of the questions would seem to indicate unreasonably high requirements, while most of them are simple enough, nearly all are mere memory tests, and the whole collection are widely scattering and devoid of any discoverable plan. It seems deplorable that difficult questions in theoretical organic chemistry should be found in any pharmaceutical State board examination in a country where scarcely ten per cent. of the druggists are graduates of any college, and where apprentices are often engaged who cannot write a dozen lines of correct English or solve a simple problem in proportion. Yet such questions are sometimes used, and not infrequently associated with childish catch questions such as never ought to be asked in any examination.

In the absence of a legally defined curriculum of studies and laboratory practice, neither the examiners nor the candidates for examination can have any settled idea of the qualifications which should be proven by the examination. Secondary questions, technicalities, and circumstances of no moment occasionally arouse a good deal of interest, and new rules more vexatious than useful are done and undone, but the main object of the law is often apparently forgotten by those who are charged with its execution.

From abundant experience I can testify that it often happens that poor students pass and good students fail to pass examinations, and it is certain that the student's own teachers are alone able to estimate correctly his qualifications. An unsystematic examination such as is sometimes given by inexperienced examiners is worse than useless.

No examination of any kind is alone a sufficient, safe, and fair test of education and skill. Upon this subject Mr. Carteighe said in the Pharmaceutical Congress: "The public in all English-speaking countries is beginning to understand that if the men that have to do with the sale and dispensing of potent medicines do not take care to be well qualified, then laws will have to be enacted by the various legislatures prescribing what their qualifications shall be, and establishing a real test for those who claim to be qualified, and when I say 'a real test' I do not mean the test of an examination merely. The people who are interested in pharmaceutical education, such as the professors at the colleges, and those of us who are in the habit of taking pupils or apprentices, too often find that some of the best men we have trained fail to pass their examinations. Experience has shown us where the causes of this difficulty are to be found. It is apparent that in the very nature of things the number of subjects that have to be dealt with, the amount of material that has to be considered, the condition of the candidate's health at the moment he is being examined, and the condition of the examiner, are all factors concerned in the result. Consequently, I hold that in any system of examination we must insist that before the candidate presents himself for examination he shall have *bonâ fide* credentials of what he has done before."

### *Compulsory Courses of Instruction.*

Mr. Wm. Martindale, a former examiner of the Pharmaceutical Society of Great Britain, said: "There is no question that we should enforce a curriculum and not allow the present condition of things to exist, which permits youths to merely cram themselves with what is necessary to answer questions at the examinations. This is the gravest fault in our present English system. There should be an enforced curriculum providing for at least a ten or twelve months' course of instruction (and more if you can get it) in the proper laboratories where botany, materia medica, chemistry, and pharmacy are taught.

"During that period the youth should give himself up entirely to his school work and withdraw completely from commercial pursuits, so as to take the necessary time which will make him an accomplished student, and enable him to regulate his mind in a way that will train it for his future life work."

The new pharmacy laws of Ontario, Victoria, and Queensland require that every person who applies for examination with the view of becoming registered as a pharmacist, must have attended a course of lectures on botany, materia medica, chemistry, and pharmacy, and passed an examination on those subjects at the school of pharmacy, and a certificate to that effect is required from his teachers or professors for the information of the Board of Pharmacy. In several European countries in which pharmaceutical education is upon a higher plane than here, no examinations are held except by the teachers at the pharmaceutical schools, whose findings are conclusive.

The Seventh International Pharmaceutical Congress unanimously gave expression to the following declaration: "Recognising the inadequacy of examinations as a means of determining the qualifications of persons seeking the important privilege of dispensing and compounding medicines, this Congress approves of the establishment of a compulsory curriculum of pharmaceutical education, and holds that no person should be regarded as a qualified pharmacist who has not pursued to completion a systematic course of instruction in the various branches of pharmaceutical science."

Several pharmacy laws render graduates in pharmacy exempt from the Board examinations, provided they also have four years' practical experience. But the Boards have no definition of a graduate in pharmacy.

Evidently the intention was that any graduate of a good school of pharmacy should be exempt from examination provided he had four years' pharmaceutical practice. The two things are perfectly distinct, and the Board of Pharmacy can easily enforce either of these requirements alone, or both separately, as the law might require. It is much better, however, to subject every candidate to an examination, whether he is a graduate or not.

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## ON SOME SPECIES OF ACOKANTHERA.

Dr. L. Lewin, of Berlin University, has recently examined the species of the genus *Acokanthera* (see *Pharm. Journ.*, [3], xxiii., 965), with the exception of *A. spectabilis*, and has arrived at the conclusion that of the species hitherto placed in this genus those which are poisonous, viz., *A. Deflersii*, Schw., *A. Schimperi*, B. and H., and *A. Ouabaio*, Cath., are characterised by a bitter taste, by containing a glucoside, and by giving a green fluorescence under certain conditions. The bitter taste appears to be due to a glucoside which has been extracted both by Dr. Lewin and by Merck from *A. Deflersii*. It is amorphous and soluble in water, and gives a left-handed polarisation. On the addition of concentrated sulphuric acid to a weak solution an intensely green fluorescence is developed. This fluorescence is produced also in decoctions of *A. Deflersii*, *A. Schimperi*, and *A. Ouabaio*, but not in that of *A. venenata*, the active principle of which Dr. Lewin believes to differ in some respects from that of the other species. The fresh wood of *A. Deflersii* boiled with water for a few minutes gives a golden yellow decoction which in forty-eight hours becomes green. This reaction does not occur with fresh wood of any species of *Carissa* that were examined, nor with old bark, taken from herbarium specimens, of *A. Schimperi* and *A. Ouabaio*. From these experiments it would appear that the above species of Acokanthera contain a bitter glucoside in the wood, differing in this character from Ouabain, which is said to be tasteless. Dr. Lewin considers that *A. Schimperi*, *A. Deflersii*, and *A. Ouabaio* are distinct species, notwithstanding their agreement in chemical characters. The distinctive features that he enumerates are, however, not of very marked importance, and are as follows:—

*A. Schimperi.*—Flowers odourless, white or often rose-coloured; leaves glabrous, 4-5 nerved.

*A. Deflersii.*—Flowers larger, pure white and fragrant; leaves more or less hairy beneath.

*A. Ouabaio.*—Leaves usually 3 nerved, with a brownish tinge on the nerves, petiole, and twigs.

These differences have been pointed out to Dr. Lewin by the celebrated botanist, Schweinfurth, and must therefore receive due consideration. The microscopic features as pointed out to him by Herr G. Volkens are even less satisfactory, as the comparison is not made on the same part in each case. Dr. Lewin proposes to limit the genus *Acokanthera* by the chemical reactions of the species (Engler, *Bot. Jahrb.*, xvii., Bd. (Heft.), 3-4). This would be an awkward precedent to follow in such a genus as *Aconitum*.

In a second paper upon the subject (Virchow's 'Archiv. für pathologische Anatomie und Physiologie und für klinische Medicin'), Dr. Lewin publishes the results of a chemical and physiological examination of them. His chemical results do not appear to be quite satisfactory, since, unlike Arnaud and Professor Fraser, he was unable to obtain a crystalline ouabain, but only a varnish-like substance containing a few microscopic crystals. As this substance possessed the physiological action of ouabain, but differed in giving a fine green fluorescence with strong sulphuric acid, in being easily soluble in water and having a bitter taste, it seems probable that Dr. Lewin's ouabain is not a chemically pure product. This view seems to be supported by the fact that his ouabain possesses many of the chemical and physiological characters of Arnaud's ouabain. Dr. Lewin has obtained a very bitter resin from *A. Deflersii* by treating the alcoholic extract (made with hot alcohol) with ether. This resin is not poisonous, and does not give the green reaction with concentrated sulphuric acid. He has named it "carissin." By decomposing the boiling watery solution of ouabain with hydrochloric acid he obtains a reddish-yellow substance, to which the name of "carissol" is given. It is insoluble in cold water, ether, and chloroform, but soluble in alcohol, and partly soluble in hot water.

Unlike ouabain, it does not act as a local anæsthetic, and its action is much slower on the heart than on the muscles generally.

It is evident that further work on this subject is necessary before the discrepancies in the characters of ouabain given by Dr. Lewin can be reconciled with the definite statements of Arnaud and Fraser, who worked with a crystalline and presumably a purer substance than the amorphous ouabain of Dr. Lewin and Merck.

*Carissa edulis* and *C. bispinata* (*bispinosa*, Desfr.) are not poisonous. The decoction is not bitter, and does not turn green.

## INDIAN GRASS OIL.*

BY WILLIAM DYMOCK, C. J. H. WARDEN, AND DAVID HOOPER.

The *Andropogon Schœnanthus* was first brought to the notice of Europeans by General Martin, who collected the seeds in the Balaghat, during the war with Tippu Sultan, and cultivated the plant at Lucknow, whence he sent seeds to Roxburgh, in Calcutta. The first mention of the oil is by Maxwell in 1825 (*Calcutta Med. Phys. Trans.*, i., p. 367); it was afterwards described by Forsyth, 1827 (*ibid.*, iii., p. 213). The *A. Nardus* of Ainslie, which he calls ginger or spice grass, is doubtless the same plant; he notices its use in infusion as a stomachic, and states that an essential oil is prepared from it which is useful in rheumatism.

*Preparation of the Oil.*—The oil distillers in Khandesh call the grass *Motiya*, when the inflorescence is young and of a bluish-white colour; after it has ripened and become red it is called *Sonfiya*. The oil obtained from it in the first condition has a more delicate odour than that obtained from the ripened grass. The Motiya oil is usually mixed with the second kind, which by itself would not fetch a good price in the European market. The grass grows freely, though not very widely, on open hillsides in West Khandesh, especially in Akráni. The original seat of the manufacture was Pimpalner, but as the oil is in great demand, the manufacture has of late spread to Nandurbár, Shábáda, and Taloda. The makers are Musalmans, who, at the close of the rains, about September, when the grass is ripening, buy it from the Bhils, stack it, and set furnaces at the sides of brooks where wood and water are plentiful. A large pit, four feet long by two wide, and two and a half deep, is dug, and a furnace (*chula*) prepared. On this furnace is placed a copper or iron caldron, large enough to hold from thirty to fifty pots of water After pouring in some water, the caldron is filled to the brim with chopped grass, and a little more water is added. The mouth of the caldron is carefully closed with an iron or copper plate, made fast with wheat dough. From a hole in this lid, a bamboo tube, wrapped in a piece of cloth plastered with the flour of *Udid* (*Phaseolus Mungo*, Linn., black var.), and bound with ropes, passes into a second closed caldron, sunk to the neck in running water. The steam from the grass is condensed in the second caldron, which, when full, begins to shake. The tube is then skilfully removed, and the contents of the caldron poured into a third similar vessel and stirred. Then the oil begins to appear on the surface, and is slowly skimmed off. The distillate is returned with fresh grass to the still. In 1879-80 the number of stills was 197, producing about 71 cwts. of oil. More than 100 stills are worked in Nandurbár alone, and the increase of the manufacture is prevented only by the scarcity of grass. The oil is packed in skins, and sent on bullock back over the Kundaibári Pass to Surat, and by Dhulia and Manmad to Bombay.

We are assured by the Bombay dealers that all the oil of commerce is more or less adulterated; and a comparison of the commercial article with some oil distilled by one of us supports this statement; the adulteration is said to be practised by the distillers, who, we are informed, are regularly supplied with oil of turpentine from Bombay. 373 lbs. of grass received from Khandesh and submitted to distillation under our own superintendence in Bombay yielded 1 lb. 5¼ ozs. of oil. Portions of this oil were mixed with oils of turpentine, groundnut, rape, and linseed; with all three it formed a milky or turbid mixture, but the two first, after standing for some days, became perfectly bright. We are informed that formerly it was the custom to adulterate with groundnut oil, but that turpentine is now used, as it cannot be detected by the evaporation test.

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* From the 'Pharmacographia Indica,' iii., 557.

The use to which Rúsa oil is put in Turkey, to which country it is principally exported, *viâ* Egypt and the Red Sea ports, from Bombay, was first explained by Hanbury (*N. Repert. f. Pharm.*, viii., 365), and in 'Pharmacographia' we find the following interesting statement:—"No drug is more subject than attar of rose to adulteration, which is principally affected by the addition of the volatile oil of an Indian grass, *Andropogon Schœnanthus*, L. This oil, which is called in Turkish *Idris yaghi*, and also *Entershah*, and is more or less known to Europeans as *Geranium oil*, is imported into Turkey for this express purpose, and even submitted to a sort of purification before being used. It was formerly added to the attar only in Constantinople, but now the mixing takes place at the seat of the manufacture. It is said that in many places the roses are absolutely sprinkled with it before being placed in the still."

The oil of *A. Schœnanthus* distilled by one of us was dextrogyre, the ray being rotated 39° to the right by a column of 100 Mm., and 78° by one of 200 Mm. Some samples of the commercial oil rotated the ray about 13° to the right, and others had little or no effect upon it. The colour of the genuine oil was that of pale sherry; the commercial samples were more highly coloured. The odour at first resembles that of the rose, but there is a persistent and terebinthinate after-flavour which is not agreeable. The taste is pungent and agreeable, approaching that of ginger.

*Chemical Composition.*—The oil of this grass, which has been named geraniol ($C_{10}H_{18}O$), is an alcohol belonging to the series $C_nH_{2n-2}O$. The two samples examined by F. W. Semmler (*Ber. d. D. Chem. Ges.*, 23, 1098), which yielded 90 per cent. of geraniol, must have been adulterated, as they turned a ray of polarised light 20° to the left, whereas the genuine oil distilled by one of us was strongly dextrogyre. Geraniol, which occurs also in *Pelargonium radula*, Aiton, has a fragrant odour of roses, and is miscible with alcohol and ether; the boiling point at 17 Mm. pressure is 120°·5–122°·5, and the refraction 48·71. With calcium chloride at 50° it forms a crystalline compound, $(C_{10}H_{18}O)CaCl_2$, decomposed by water and slowly oxidised by air. Potash-fusion forms iso-valeric acid. Neutral aqueous $K_2MnO_4$ forms acetic and iso-valeric acids. Even boiling baryta-water slowly forms iso-valeric acid. Chromic acid mixture forms citral (*Semmler*), $HNO_3$ forms nitrobenzene, HCy, oxalic acid, and a resin, but no camphoric acid (*Beilstein Chemie*, iii., 265; *Watts' Dict. Chem.*, 2nd ed., ii., p. 609; *Ber. v. Schimmel and Co.*, April, 1891, p. 37).

*Commerce.*—The official statistics only show the combined export of grass oils, and do not enable us to distinguish the different kinds. In 1888–89, 15,270 gallons of these oils, valued at Rs. 267,800, were exported. As we have already stated, the production of Rúsa oil in Khandesh, the chief source of supply, does not much exceed 70 cwts. yearly. The value of oil of good quality in Bombay is about Rs. 3½ per lb. It is exported in pots containing about 40 lbs. each.

## DISINFECTANTS.*

BY CARRIE M. STEWART, D.D.S.

The experiments given in this paper were made for the purpose of ascertaining what agent, alone or combined, would best answer the requirements for a dental disinfectant; one which can be used in diseased conditions of the oral cavity, alveolar abscess, putrid pulp, etc., with especial reference to quickness of action, with the least possible irritation and greatest acceptability to the patient. The germs used in the experiments were those often found in the mouth, the *Staphylococcus pyogenes aureus* and *albus*. The bacteria belonging to the cocci groups were selected because of the greater resistance of this form of germ to destructive influences than those belonging to the bacilli or spirilli types.

The germs were grown in test tubes containing 5 C.c. of beef bouillon. To this 1 C.c. of the disinfectant was added. The exact amount of each was determined in order to be sure of the amount of dilution of the reagent used, and also because of the greater perfection of the drug's destructive action, it being subjected to a more severe test when tried upon the millions of micro-organisms growing in the bouillon, than if the bacteria had been introduced into the germicidal solution with a platinum wire, on dried threads or a few drops of the inoculated medium. Besides, in the number of germs and dilution of the agent, it more nearly approximates the condition found in the mouth.

The time used was fifteen minutes, gelatin plates being inoculated at the end of 1, 2, 3, 5, 10, 15 minutes respectively. This time is the same, as near as possible, as that used ordinarily in the employment of medicinal agents in the mouth. The loop of platinum wire used for inoculating the gelatin was very small, in order to avoid carrying over enough of the disinfectant to form an area of sterilised gelatin around the germs, and preventing their growth, give rise to the false impression that they were deprived of life before being carried over. The liquefied gelatin was thoroughly shaken, after the introduction of the disinfected germs, for the same reason. The normal time for the development of bacteria which had not been acted upon by chemical agents was usually about forty-eight hours, with the temperature of the room between 25° and 30° Centigrade.

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* From the *Dental Register*, through the *British Journal of Dental Science* October 16.

Heat, of course, is the most effective form of sterilisation, and although it cannot be conveniently applied in the mouth, its effects upon the germs were proved, and it was found that in boiling water the *Staphylococcus pyogenes aureus* was destroyed in one minute. With steam heat at 100° the same results followed, in the same length of time. From seven to eight days was the time given for the development of the plates, as only the most resistant organisms survive the exposure to destructive agents, and the longer the time employed the greater number succumb, there being a "survival of the fittest" here as elsewhere in Nature's economy. Those which finally develop require more time for the process than would be necessary under the natural conditions.

Bichloride of mercury, 1 to 2000, with the *S. pyogenes aureus*, bouillon culture seven days old. Development was prevented by one minute's exposure. There has, however, been some dispute in regard to the high rank given $HgCl_2$ as a germicide, some claiming that although it retards the development of germs for an indefinite period of time, under favourable circumstances and the action of certain salts, the chemical combination formed between the albuminous capsule of the germ and the bichloride of mercury will be dissolved and development take place. It is well known that an extremely small amount of this salt is at least antiseptic in character, and although this theory has not been satisfactorily proved as yet, neither has it been disproved, and on this account further experimentation with the salt was left until another time.

Oil of peppermint, 1 C.c. to 5 C.c. of a bouillon culture of the *aureus*. Development of an innumerable number of colonies took place in every plate after a period of three days.

Permanganate of potassium, 1 per cent. solution, 1 to 5 of bouillon culture of *aureus*. Numerous development occurred after three days. In a 2 per cent. solution in the same proportions the same results were obtained in the same time. After a fifteen minutes' exposure, the development in both the 1 per cent. and 2 per cent. solutions was somewhat retarded.

Permanganate of potassium, 4 per cent., 1 to 5 of a bouillon culture of *S. pyogenes albus*. Development took place in all the plates after three days.

Permanganate of potassium, 1 to 5 of the concentrated solution, with the *aureus*. No development occurred in any plate.

Chloro-phenique, bouillon culture of *albus*, 1 to 5. No development occurred. This agent precipitates albumin, and is irritating to the tissues.

Listerine, 1 to 5 of a bouillon culture of the *albus*. All plates were well developed after four days.

Saccharine prevented the development of the *S. pyogenes aureus*, in the usual proportions, after a one minute exposure.

The action of carbolic acid being so well known, no experimentations were made with this drug.

Some of the other products of coal tar distillation were next tried, the concentrated liquids coming from the German laboratories, and the desired percentage made with distilled water. A 2 per cent. solution was employed.

Aseptol, a clear, slightly brown liquid, with a decidedly acid reaction, 1 C.c. to 5 C.c. of a bouillon culture of the *aureus*. After five days, great development took place in every plate but that of the two minutes' exposure, which presented no colonies. This irregularity may be accounted for by the fact that only feebly resistant germs happened to be transferred to the second plate, and destruction having been accomplished before the transference, there was no development; or, it may be, too much of the aseptol was carried over, although that is hardly likely, as every means was employed to prevent this taking place.

Creolin, a very dark solution with a strong odour of tar, produced a pinkish white emulsion with water and alcohol. 1 to 5 C.c. of a bouillon culture of the *albus* prevented all development.

Creosol, a beautiful straw-coloured liquid, neutral reaction and sharp biting taste, in the usual proportions, with the *albus*, prevented all development.

Chinolin, a golden-brown liquid, producing an emulsion with water, 1 to 5 C.c. of a bouillon culture of the *albus*. Development took place in the first three plates after seven days, the one minute plate being developed in five days. The agent appeared to be a germicide after a five minutes' application.

Lysol, a dark brown syrupy liquid, in the concentrated state, produces a beautiful straw-coloured solution in distilled water or alcohol, while water containing lime salts assumes a decidedly milky appearance by the addition of this agent. It possesses a characteristic odour which is not at all unpleasant, but rather agreeable. A 1 per cent. solution was found to be an antiseptic only, development appearing after three days on the first two plates and a day or two later on the others. From a 2 per cent. solution upwards, the agent is germicidal in its action in one minute. On the germs of saliva, no development took place in the plate treated with lysol, while eight colonies resulted in the plate of normal saliva. Lysol more nearly answers the definition of a disinfectant than any agent experimented with, as it is a prompt and effectual deodoriser, a good detergent, and a prompt germicide; combining in one drug the qualities so essential for a dental disinfectant. When used on very sensitive surfaces, the weaker solutions should be used first, as irritation results from the immediate application of a 5 per cent. solution to such surfaces. In addition to its prompt, beneficial action, lysol is not disagreeable to most patients, and seemingly uninjurious to the teeth.

There are disinfectants and disinfectants, and this paper presents a glimpse of a few out of hundreds. These few, however, have been thoroughly and carefully tried and the results given. The point nowadays is to find something one is sure of and can rely upon. New discoveries are constantly being made and old remedies discarded, until it becomes quite a problem to the practitioner what to depend upon. Only yesterday, comparatively, iodoform was relied upon as one of the great mainstays of dentistry, but it has been forced to take a lower position in the scale of dental medicine, and its place will probably be filled, in the near future, by something far better.

The Pharmaceutical Journal
FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, DECEMBER 30, 1893.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## ROBERT BENTLEY.

JUST before going to press we have received information that the death of Emeritus Professor BENTLEY took place on the 24th instant, at his residence, 91, Warwick Road, Earl's Court. To the members of the Pharmaceutical Society and the large number of those who have been students in the Society's School the news of Professor BENTLEY's death will be a source of profound regret. There is not time to do justice to an obituary notice of the Professor in this week's Journal; but, in the meantime, it may be stated that as a student he was contemporary with the establishment of the School, and that for many years he was associated with the work of the Society in the capacities of Professor of Botany and one of the editors of the Journal. The funeral will take place on Saturday, the 30th instant, at Kensal Green Cemetery, at 3 p.m.

## THE SALE OF POISONS.

As the readers of this Journal will be aware, considerable attention has been directed to the subject of the sale of poisons by the Parliamentary Bills Committee of the British Medical Association, and at its last meeting the Chairman, Mr. ERNEST HART, presented a long report, setting forth the progress which has been made in the application of the Pharmacy Act, together with various suggestions as to the amendment of that Act. At the commencement of the report satisfaction is expressed at the increased precautionary control of the sale of poisons which has been effected, but it is pointed out that there are stil several points remaining undetermined of sufficient importance to require further efforts in the same direction. Having regard to the fact that the express object of the Pharmacy Act was to protect the public against the danger likely to arise from the unregulated sale of poisons, it was thought reasonable to expect its provisions should prove to be sufficient for that purpose. It was under that belief influence was brought to bear upon the Treasury to take action in regard to the sale of proprietary medicines, commonly but erroneously termed patent medicines. The result of the prosecution instituted by that department established a basis for enforcing more adequate observance of the Pharmacy Act, inasmuch as it established the necessity of duly labelling secret preparations when they contain poison, and the equally necessary restriction of their sale to the hands of persons qualified under the Pharmacy Act. For enforcing the observance of these precautionary measures it was then necessary to have recourse to the Pharmaceutical Society, as the body empowered to administer the Act, and the action taken by the Council is spoken of as having manifested commendable regard for the public duty devolving upon it.

The side issues raised in the defence of the PIPER case, and in the appeal against the decision of his Honour Judge BACON, are commented upon as showing a misapprehension of the fact that for the administration of the Pharmacy Act the question, What is a poison? does not arise, since the Act itself defines most precisely what articles are poisons within its meaning. In the case of the particular preparation to which the PIPER case applied, it is a poison in that sense because it is a preparation of morphine, and therefore subject to the provisions of the Act, irrespective of considerations as to the quantity that would be poisonous. In regard to the preparations which are actually the subject of Letters Patent, it is suggested that the exemption provided for in the Pharmacy Act cannot consistently be understood as applying to the retail sale of such preparations when they contain poisons within the meaning of the Act; but that, like other cases in which the sale of poison is exempted, it is only the wholesale dealing in patent medicines which can reasonably be supposed to have been intended by the legislature. It is held to be inconceivable that the Act could have been passed with a provision that would have the effect of frustrating the special object contemplated. This is a novel view of the matter, and it will no doubt give rise to considerable discussion.

Among the suggestions offered as to further legislation for the amendment of the Pharmacy Act, the compulsory statement of the composition of all proprietary medicines on their labels is mentioned as being desirable. With such a regulation in force, it is pointed out that "ignorance of the presence of poison in such articles would then no longer be a source of danger to those using them, nor could retailers shelter themselves under that excuse for breach of the law, facilitated by concealment of the fact on the part of the makers." The alterations which have been made in the composition of certain proprietary medicine since the decision of the chlorodyne case is mentioned as a strong argument in favour of making the statement of composition upon every bottle or packet compulsory, so that the danger of concealed poison may not be supplemented by the further danger arising from variation in the composition of such articles. Lastly, in regard to the position occupied by the Pharmaceutical Society as the body empowered to administer the Pharmacy Act, it is suggested that an extension or transfer of that power to some other department, more independent of trade influence, might be desirable as conducing to the benefit of the public. As a reason for that suggestion it is stated that there is reason to believe the Council of the Society has been hampered in the administration of the Act by the fact that the opinions and practice of the trade which it represents have not infrequently been opposed to a strict interpretation of the Act. The opinion is also expressed that it is a remarkable circumstance such should be the case. It is not the first time that the idea of a transfer of the power of prosecution under the Pharmacy Act has been mooted; but though its adoption might secure the advantage of relieving the Society from the reproach of being actuated by interested motives, there are other considerations in favour of the opinion that the power of action could not well be placed in more competent hands.

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## COMPRESSED GASES.

The circumstances connected with the explosion of a steel cylinder, charged with compressed oxygen, at Bradford, have been made the subject of investigation by Professor Goodman, of the Yorkshire College, Leeds, and the conclusions he has arrived at have been published in the form of a report. The fragments of the exploded cylinder presented throughout short crystalline fractures, and none of the pieces showed the least indication of reduction in area at the fractured surfaces, a fact which speaks at once for the brittleness of the material and a deficiency of toughness. The results of experiments made for the purpose of determining the tensile strength of the metal showed that it was far in excess of the limit at which the brittle character of steel becomes too pronounced to admit of the metal being safely subjected to high pressure, as in cylinders charged with compressed oxygen, and the possibility of sudden concussive shock. Chemical analysis of the metal also showed that it contained a much larger amount of carbon than is consistent with the requisite tough and ductile character suitable for enabling the metal cylinders to bear very high internal pressure. The amount of silicon was also very large, and there were indications that the cylinder had not been properly annealed so as to give the metal the highest degree of toughness and ductility.

It is to be inferred from these results that the metal of which the exploded cylinder had been made was in itself unsuitable, and that sufficient care had not been taken to preserve the cylinder in a condition fit for being charged with compressed gas. In regard to these points, Professor Goodman states that cylinders for holding compressed oxygen should be made of very mild steel, the tensile strength and percentage of carbon of which should not exceed certain limits. Care should also be taken to ensure a sufficient and even thickness of the metal, and the cylinders should be annealed at a cherry-red heat, both when newly made and at intervals while in use. As a further precaution against accident it is recommended that the pressure to which cylinders are subjected in testing their fitness for being charged with compressed oxygen should not be carried so far beyond the actual pressure they will have to bear when in use, as is sometimes done. The consequence of applying very high test pressure is, on the one hand, to encourage the use of steel having high tensile strength with corresponding brittleness, and, on the other, to weaken the cylinders by overstrain.

It is evident that, in order to make the use of compressed gases perfectly safe, very considerable care should be exercised in the construction of the cylinders used for the purpose, and in ascertaining from time to time that they are fit for use. It is satisfactory to gather from Professor Goodman's report that these conditions can be secured. In carrying out his experiments comparative trials were made, in which the cylinders used for holding compressed oxygen at the Yorkshire College were tested as to the character of the metal they are made of, as well as their capability of resisting internal pressure and sudden shock. One of these cylinders, on being subjected to a pressure of 6,200 lbs. per square inch, showed some signs of bulging, but did not burst until the pressure was increased to near 6,800 lbs. per square inch, or 3·7 times the ordinary working pressure. Another fully charged cylinder of 4-in. diameter was twice dropped through a height of twenty-two feet upon a cast-iron block without any further effect than the production of a very slight dent. Further trials by dropping through a height of fifty feet had a similar result. The cylinder was then subjected to hydraulic pressure under a sharp-edged block until squeezed almost flat, and it then suddenly ruptured with a loud report, but without detaching a single loose fragment. The tensile strength of the metal of which this cylinder was made was considerably less than that of the Bradford cylinder. The percentage of carbon was also much smaller, and the corresponding toughness was proved by the experiments above described. Consequently the conclusion that compressed gas cylinders can be made perfectly safe appears to be very well founded. The equally important question as to how that safety is to be ensured in all cases has not been touched upon by Professor GOODMAN; but there are now so many applications of compressed gases that a trustworthy guarantee of security from danger is highly desirable, and to that end it would appear satisfactory to have some kind of official inspection and certificate of fitness.

### DRAINS AND DISEASE.

A DISCUSSION on the modes in which puerperal septicæmia is contracted lately took place at the Obstetrical Society, and was extended in the *British Medical Journal* to typhoid fever, diphtheria, and other diseases. This discussion is of the greatest interest, and touches upon many important questions. The impression left by a general consideration of the arguments put forward is that much careful investigation is still needed before a definite answer can be given to the question: "Can sewer-gas convey specific infection?" That the morbific elements of many diseases exist in the drains of all large towns is clear. For instance, the dejecta of persons suffering from typhoid fever are as a rule not effectively sterilised even in our large hospitals, much less in private houses, and as a rule not at all in mortuaries where autopsies are carried out, the contents of the intestines and other infectious materials being simply transferred by washing into the drains. In private houses where cesspools exist a single case of infective disease may render the contents of the cesspool dangerous for an indefinite period of time. Granted that microphytes, such as are believed to provoke diphtheria, typhoid fever, and the various forms of disease loosely grouped under the term septicæmia, are often present in sewers, it remains to be decided whether it is possible for such microphytes to find their way into the air? It may be well to recall what is known of the bacteria of the air of living rooms. Popular lecturers at one time were in the habit of showing in a darkened room the clouds of dust circling in a beam of light, and causing a shudder by saying that the particles of such dust-clouds were either germs or germ-laden materials, and suggesting that each germ was potentially pathogenic. It is now known that in eight cubic inches of the air of an ordinary living-room there are but three or four microphytes, and these are for the most part harmless moulds, yeasts, or micrococci. It appears that only one pathogenic bacterium (*Staphylococcus aureus*) has been discovered in the air. So far this evidence is of a hopeful nature.

Fresh solace may also be found in the fact that vapour given off by evaporation from the surface of a liquid containing bacteria has been found to be incapable of carrying bacteria with it into the air. It has also been found impossible even by a strong current of air to detach bacteria growing on a moist gelatin plate. When gas is rapidly formed in a decomposing fluid and escapes in bubbles on the surface, there may be produced a fine spray containing bacteria and capable of being carried away by a current. In this way it is just possible that a few of the bacteria of the sewer may reach the living-rooms where the drain system is defective. In another way, too, this may be effected by the overflowing of drains, and the sewage, carried by the feet of persons passing into the house, may, when dry, give up some of its solid residue to the air. When, however, we consider the damp pipes through which sewer-gas must pass before it reaches the house, it must rarely happen that it is the vehicle of infection. What, then, are we to think of the numerous instances of general ill-health, sore throat, diphtheria, suppurations, etc., which are so often attributed to sewer-gas? In many cases infection from other individuals suffering from such diseases can be proved, either directly or indirectly, through milk, etc.; sometimes, again, the defective drainage is found to account for the spread of infection, not by means of sewer-gas, but by contamination of the water supply; this, of course, may occur in various ways. But it would appear that specific contamination of the drains must exist even before the polluted water supply can cause a spread of the disease. In many villages the chief water supply consists of an open pond which feeds the common pump. Children and cattle often have access to the pond from which the water is taken without any filtration. In one village within two hours of London the inhabitants are celebrated for longevity and good health, and until lately the water supply was as described above. In such a place a single case of typhoid or diphtheria may contaminate the water supply and cause a disastrous epidemic.

It is at the present time tolerably certain that cases of infectious disease arise from previous cases, and that the germs of disease do not originate *de novo* in decomposing matter. Defective drains may be the channel of infection, but not, at any rate as a rule, through the medium of sewer-gas. In medical practice the paramount importance of personal disinfection and antiseptic measures becomes apparent. In many cases the blame has been laid on the drains instead of on the inefficient antiseptic precautions taken by the surgeon. Even at the present time there are many medical men who do not understand the principles of antiseptics. Many employ ineffective media. The most effective antiseptic media at present known appear to be the bichloride and the biniodide of mercury. Of the former a 1-1000 solution for cleansing the unbroken skin, and 1-2000 for mucous membranes and wound surfaces are perfectly satisfactory. In large, deep wounds, such as those made in operations on the kidney, it is safer to use a 1-40 solution of carbolic acid. Instruments must be boiled in water or steeped in 1-20 carbolic solution, since they are spoiled by the salts of mercury.

### EXPORT OF TINCTURES.

WITH the view of still further increasing the facilities for the exportation of tinctures made by British manufacturers, the Inland Revenue Department has lately issued an order which deals with a number of matters of detail. As is well known, duty has to be paid upon all spirit used by manufacturers in the United Kingdom, but they receive a rebate of the duty on tinctures and other spirituous preparations when exported. The quantity of tinctures has hitherto always been estimated by measure; but as a large number of these preparations are sold by weight, the Revenue officers are now empowered to receive the necessary particulars in pounds. Thus, tinctures may now be exported in bottles containing ¼ lb., ½ lb., 1 lb., 2 lbs., and 4 lbs. exact net weight of tincture, and vessels may be used of a larger size than those formerly allowed. All the bottles in any package must be of the same size, or the contents of the same net weight, and no single package may be filled with bottles of which the contents are partly calculated by weight and partly by measure. The "number of pounds in the gallon must be stated," and no less quantity than two bulk gallons exported. Packages of more than ½ gallon or 4 lbs. must contain 1 gallon or a multiple thereof, or 8 lbs. or a multiple thereof. The conditions to be observed by rectifiers or compounders exporting tinctures, essences, or perfumed spirits on drawback may be ascertained by consulting the Calendar of the Pharmaceutical Society, a new edition of which is in the press.

### COMPULSORY EDUCATION OF PHARMACISTS.

THE *Pharmaceutical Era*, referring to the resolutions passed by the International Pharmaceutical Congress regarding pharmaceutical education, considers that "the law is justified in demanding from pharmacists full competence of professional experience and general professional education, but is exceeding its rights when it dictates the particular manner in which this competence is to be attained." The question whether practical experience in pharmacy should be gained before or after the college course is described as not yet settled, though of late years the belief is said to have been growing that it is better and easier obtained afterwards, and that the years before entering college are best applied in gaining a general education, such as will enable the student to profit in the greatest degree from the instruction provided by the college. The opinion is also expressed that colleges of pharmacy should insist on such a preliminary education as shall ensure the ability of students to follow the teaching given, and that there should be uniformity in the training at different colleges. This preliminary education should embrace a thorough knowledge of the branches usually taught at grammar schools—reading, writing, grammar, arithmetic, algebra, Latin, etc. —the exact limit being decided by the colleges; the subsequent course of instruction should occupy at least three years of six months each or two of nine months'; the colleges ought not to arrange their syllabuses so as to admit of students dividing their time between college and store service; and the amount of laboratory instruction should be largely increased.

### CLASSES IN BACTERIOLOGY.

WE have received the syllabus of the next evening courses in General Bacteriology and the Bacteriology of Fermentation, to be held at King's College, London, commencing Monday, January 22, and Wednesday, January 24, respectively. These courses are specially suited to pharmacists, analysts, etc., the practical work performed being of great value as a general training, apart from its special applications. Full particulars may be obtained of R. T. HEWLETT, M.D., at the College.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

ON Thursday evening, December 21, a musical and social evening was held in connection with this Association, Mr. S. M. BURROUGHS occupying the chair. The arrangements were carried out by the Secretaries, and with the help of the comprehensive talent of the artistes, a thoroughly enjoyable evening was spent. The above meeting closes the programme of the first half of this session, and the new half session will commence with a musical and social evening upon Thursday, January 4. According to the programme of the meetings of the Association for this second half of the session, the following papers are to be read:—"Sponges," by W. MURTON HOLMES; "Solution," by H. T. DURRANT; "Vinum Ferri," by EDMUND WHITE, B.Sc.; "Poisonous and Infected Foods," by A. P. LUFF, M.D., B.Sc.; "Œsypum and Lanolin," by T. H. HEAP; "Chemistry of Agriculture," by T. TICKLE; "Recent Advances in Chemical Theory," by FRANCIS H. CARR; and "Rectified Spirit," by C. E. SAGE. There will also be a discussion on "A Suggested Code of Pharmaceutical Ethics," to be opened by E. H. GANE, short papers by members, and the usual musical and social evenings, whilst the annual dinner will be held in March.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, December 7, Mr. T. Tickle, Vice-President, in the chair.

A paper on "Bees" was read by Mr. Aubrey T. Hill, who described their habits and mode of life, the methods of rearing and dealing with them, and the products of their labour. It was illustrated by specimens of the different combs in which drones and worker-bees were developed, artificial bases for combs, screens for preventing access to the honey-combs by drones or queens, etc., and gave rise to a discussion in which the Chairman, Secretary, Messrs. Crouch, Guyer, Southall, and T. M. Taylor took part.

The following paper was next read:—

### COMMERCIAL JALAP AND JALAPIN.

BY C. E. ROBINSON.

At the last evening meeting of the Pharmaceutical Society it was stated that the jalap of the present day had very much deteriorated from that of some years ago, and that now it was difficult to obtain jalap of the B.P. standard. As the examination of jalap was one of the suggestions in Mr. Ransom's address to the Association, I determined to examine several samples and report the result to you in a short note this evening.

Before proceeding further, I will read an extract of Dr. Attfield's report to the British Medical Council for 1888, which shows the quality of jalap about that time. "The minimum proportion of resin which is officially required to be present in dried jalap is, in the British Pharmacopœia of 1885, fixed at 10 per cent. The United States Pharmacopœia, published in 1882, required 12 per cent. A few years prior to 1882, a fair admixture of the tubercles would have yielded, when ground, 13 or 14 per cent. of resin. According to Squibb (Ephemeris, vol. iii., No. 3, p. 1095), the jalap of the British and American markets would have yielded, on an average in 1888, scarcely more than 7·5 per cent. Cripps (*Pharm. Journ.* [3], xix., p. 422) shows that the average strength of jalap in this country at the present time is higher than Squibb's estimate, yet does not quite reach the official minimum, only fourteen samples out of thirty-four containing 'not less than 10 per cent. of resin,' while eight of the thirty-four contained less than 7·5 per cent. Clearly, the proportion of resin yielded by jalap has for the past twenty years been gradually diminishing. Even with the present apparently low official standard of 10 per cent., druggists have to use the weak tubercles for making resin in order to obtain powdered jalap that shall contain 'not less than 10 per cent. of resin.' Jalap and its preparations are far less frequently used than formerly; nevertheless, in a future British Pharmacopœia, the required strength may have to be reduced and the formulæ of most of its preparations may have to be readjusted." Since that date published estimations by different workers have yielded, on an average, from 8 to 13 or 14 per cent. As the jalaps coming into the wholesale market are frequently estimated by wholesale druggists and others, and the inferior qualities rejected, I have preferred to examine samples which for the most part have come from retail shops. I have examined ten samples, obtained at different places, ranging from high class pharmacies on the one hand to grocers and stores on the other.

All the samples were treated in the same manner, being extracted with spirit by continuous percolation in an extracting apparatus, the spirit evaporated, and the remaining resin washed in water, to get rid of saccharine and colouring matter, dried and weighed.

The resins were afterwards treated with ether until exhausted, and the residues again dried and weighed to ascertain the amount soluble in ether.

Treated in this manner, the following table will show the results obtained:—

| Sample. | Percentage of resin. | Portion of resin soluble in ether. |
|---|---|---|
| A | 7·57 | 27·16 per cent. |
| B | 12·16 | 9 42 ,, |
| C | 16·9 | 8·33 ,, |
| D | 12·07 | 11·35 ,, |
| E | 9·91 | 11·55 ,, |
| F | 11·82 | 16·46 ,, |
| G | 10·20 | 17·73 ,, |
| H | 17·7 | 9·0 ,, |
| I | 12·19 | 22·96 ,, |
| J | 9·87 | 20·06 ,, |

From these results B, C, H would seem very good jalaps, D, E very fair, while the remainder are all very suspicious, and some are very bad. With the exception of A all yield a very good percentage of resin, but the large percentage of that resin which was soluble in ether would, in some cases, point to the admixture of some unofficial jalaps or other adulterations.

Turning now to the "jalapins."

The commercial substance known as jalapin being unofficial, it might be expected to vary considerably.

"Jalapin" is generally prepared by extracting the powdered jalap with alcohol, adding water until slightly turbid, and then adding animal charcoal. After digesting and boiling for some time, the tincture is filtered off, evaporated to dryness, and the residue washed with hot water to remove gummy and saccharine matter, and then again dried.

It would thus appear that commercial jalapin is nothing more or less than pure decolorised resin of *Ipomœa purga*.

I have estimated five samples of "jalapin," and the results show that they have all been obtained from true jalap, *Ipomœa purga*. They were first dried at 100° C. for an hour and then treated with ether until exhausted of ether soluble resin, and again dried until the weight remained constant, and then weighed.

| Sample. | Moisture. | Soluble in ether. | Insol. in ether and sol. in S.V.R. | Insol. in ether and insol. in S.V.R. |
|---|---|---|---|---|
| 1 | 6·29 p.c. | 4·63 p.c. | 89·08 p.c. | none |
| 2 | 6·64 p.c. | 4·22 p.c. | 89·14 p.c. | ,, |
| 3 | 6·33 p.c. | 3·79 p.c. | 89·88 p.c. | ,, |
| 4 | 6·84 p.c. | 5·67 p.c. | 87·49 p.c. | ,, |
| 5 | 6·08 p.c. | 5·80 p.c. | 88·12 p.c. | ,, |

From the above figures it will be noticed that the amount of moisture was practically the same in each case. This would point to the moisture present having been absorbed from the atmosphere and not being left in by the manufacturer. The small amount of ether soluble resin in "jalapin" compared to that of jalap resin [the amounts now obtained agreeing with those obtained by Mr. Edmund White in 1887 (*Pharm. Journ.*, [3], vol. xvii., p. 650)] is rather curious, and it would be interesting to know why this should be; whether it is that in the process of decolorisation some of the ether-soluble resin is held back; or whether, on adding the water until slightly turbid, that the turbidity produced is due to some of the ether soluble resin being precipitated; or whether it is due to the fact that the weaker tubercles, which are used for the manufacture of jalap resin, contain a smaller proportion of ether soluble resin.

A few words in reference to the names jalapin ($C_{34}H_{56}O_{16}$) and convolvulin ($C_{31}H_{50}O_{16}$) which are used, with different meaning, by English and foreign writers, and thus cause so much confusion to students and others. Convolvulin (according to Mayer) is the resin of jalap which is not soluble in ether, and forms by far the greater part (90 per cent.) of jalap resin, B.P.; while jalapin is that which is soluble in ether and only constitutes a small portion (10 per cent.) of jalap resin, and is identical with scammonin obtained from scammony root.

In England these names are often applied in an exactly contrary sense, and we keep to these names because of the confusion which would arise if they were now altered. Knowing that there is this discrepancy, would it not be better to alter our nomenclature so as to agree with that in general use on the continent and in America? Although the confusion that would arise would doubtless be great at first, it is a question whether it would not be better to face that confusion and get it over, than to remain in the state of confusion which at present exists.

A discussion followed, in which the Chairman, Secretary, Messrs. Southall, Bryan, Crouch, Guyer, T. M. Taylor, and Gane joined.

After a further discussion as to what should be dispensed when "pil. opii gr. ½" is ordered in a prescription, the meeting adjourned.

## THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

A meeting of the above Association was held at the Westbourne Restaurant on Wednesday, December 20, at which about twenty members were present.

A vote of thanks to Mr. W. Martindale for his conduct in the chair as President of the Association was most cordially and unanimously passed.

The President (Mr. Andrews) then made a brief survey of the work of the Association since its formation in 1890, pointing out that owing to its steady progress and the friendly feeling of its members there were no great events to record, but that several matters of considerable importance had been discussed, and action taken thereon, that had proved of benefit to the members generally. Allusion was made to the increase in the annual amount given to the annuitants of the Benevolent Fund, and to the recent alteration in regulation No. 12, whereby the Council of the Society takes power at its discretion to vary the amount of the annuity according to the circumstances of the recipients, and the speaker concluded with an appeal to those present to subscribe to the fund if they had not already done so.

The Vice-President (Mr. Parker) proposed a vote of thanks to the President for his address, and alluding to the subject of the affiliation of kindred associations, suggested that much might be done which the Pharmaceutical Society could not undertake.

Mr. Hyslop seconded the resolution, which was carried *nem con*, and in the course of his remarks, he (Mr. Hyslop) seemed rather to deprecate the idea of federation, as he was of opinion that the Pharmaceutical Society was the proper body to work for the whole. He considered that pharmacy was steadily progressing, and that there was no necessity to be noisy or aggressive.

Mr. Butt alluded to the probability of a new edition of the Pharmacopœia being issued shortly, and that pharmacists would be consulted thereon.

Mr. Marsh thought that the great increase of stores and branch businesses would soon become very detrimental to pharmacy and the Pharmaceutical Society. He was of opinion that the examination of the Society should qualify for one business only.

Mr. Urwick thought that although the Western Chemists' Association was successful and progressing, it might be more so if made more widely known.

The President replied, and suggested that at the next meeting the subject of affiliation should be introduced and fully discussed, thinking that it could not possibly do harm, but might be productive of much good.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, November 23, the President, Mr. E. F. Harrison, in the chair, the following paper was read:—

### NOTES ON THE CHEMICAL AND MICROSCOPICAL EXAMINATION OF URINE AND SPUTUM.

BY E. J. MILLARD.

The examination of urine and sputum has been frequently recommended as a proper subject for pharmacists to undertake for the physician. My own experience, and doubtless that of many others, tends to show that the requirements in these examinations are more complex than even a few years ago. The fact is, very many medical men perform the comparatively simple operations of testing for sugar and albumin, ascertaining the specific gravity and percentage of urea almost daily, and require but little assistance. The inventions of pharmacists have themselves tended to this result, and the simple apparatus of Gerrard and of Squibb is to be found in many consulting rooms. There is probably far too much reliance placed upon single tests in urinary analysis by physicians, and I apprehend that in the future the more thorough chemical training of the pharmacist will induce busy practitioners to hand over to him this branch of analysis, even as now they are prone to do when they meet with difficulties.

I am assuming that you have read the excellent paper on urine analysis,* given by Mr. Saul in this room, in 1887, and the pathological notes by Mr. Stainer in 1891. I have no intention of going over the same ground, except so far as to draw your attention to new methods and tests, but rather to point out some of the abnormal features of the subject elucidated by the recent advances and discoveries in physiological chemistry.

### URINE.

*Colour.*—The normal colour of urine may be affected by disease or by drugs. If light yellow, it may be due to drinking much water, or after hysterical fits or other nervous affections. Urine in diabetes is usually light coloured. High coloured urine of reddish-yellow tint may be due to the presence of santonin or chrysophanic acid from rhubarb, and if to any large extent, strong alkali will render the urine red. If the urine is already reddish-brown, it may be from fevers or from blood. The urine of fever cases is usually concentrated, clear, and highly coloured. A red tint is frequently given to urine by the administration of logwood. Dark coloured urine may be due to bile-colouring matter, blood, or carbolic acid, etc. It is often brownish or tinged with green if due to bile, as in jaundice. A smoky-brown colour to almost black will probably indicate blood excreted from the kidneys. In this case it deposits a brown sediment containing corpuscles and granular pigment. In melanotic cancer the urine, after standing, frequently turns blackish. The administration of carbolic acid or creasote renders the urine dark green to black, and senna occasionally, in large doses, turns it brown.

*Reaction.*—Normal urine is acid owing chiefly to the presence of acid sodium phosphate derived from the basic sodium phosphate of the blood. After a full meal the urine is frequently alkaline, due to the liberation of bases by decomposition with the acid of the gastric juice. This is called the "alkaline tide," whilst the "acid tide" occurs after a fast, such as before breakfast. In febrile affections, such as acute rheumatism, the urine is highly acid.

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* *Pharm. Journ.*, [3], xvii., p. 855.

*Albuminuria.*—It is still a moot point whether "physiological or functional" albuminuria can exist in health, but several observers state that albumin has been found in the urine of persons without any pathological lesion. These cases have occurred after excessive exertion or exposure to cold. In Bright's disease the amount of albumin passed rarely exceeds 1 per cent. According to Freund, the blood serum of the body is only combined with 450 grammes of albumin, and if 8 or 10 grammes of this were lost daily, the result in a short time would be alarming. Recent investigations indicate that increased importance is attached to the separation of the two forms of albumin which occur in albuminuria. Noel Paton's method[*] is to first estimate the total proteids by means of Esbach's albuminometer. Then 20 C.c. of the urine is neutralised with dilute potash and powdered sulphate of magnesium added until saturation. The flask containing the saturated urine is kept in a warm place for twenty-four hours. The volume is measured, filtered, and a portion estimated in the albuminometer in the usual way. Calculation is made for the dilution caused by the addition of the sulphate, and the corrected figure gives the amount of serum-albumin. By subtracting this amount from the total proteids found at first, we obtain, by difference, the amount of serum-globulin which has been precipitated by the magnesium sulphate. The more serum-globulin found in the sample, the more unfavourable appears the diagnosis in Bright's disease. It should be remembered, however, that when blood is present in urine, as in nephritis after scarlet fever, there is a large increase in the amount of serum-globulin.

Amongst the tests for albumin of recent introduction, perhaps the most important is trichloracetic acid. It was recommended by Dr. Mortimer Granville, in a letter to the *Lancet*, because it "does not throw out peptones like the potassio-mercuric iodide, or coagulate mucin like so many other tests, and there is no need to countercheck the experiment by heat."

There can be no doubt about its delicacy, as I find that it will easily detect 1 part of albumin in 100,000 parts of urine. Its behaviour with alkaloids is rather peculiar. You will observe that on cautiously adding a few drops of this solution of trichloracetic acid to urine containing quinine, a precipitate is produced which redissolves on shaking. Further addition of the reagent, however, throws out the alkaloid as a white dense precipitate, but which is soluble in a large excess of the acid. It is also soluble when heated.

According to Dr. D. M. Reese (*Johns Hopkins Hosp. Bulletin*, No. 8), trichloracetic acid precipitates a form of albumin from urine which is dissolved by acetic acid. In fourteen out of eighty-seven specimens of urine he obtained a precipitate with trichloracetic, and not with nitric or picric acids, or heat and acetic acid. The importance of these results was apparent when in eleven out of the fourteen cases granular, epithelial, or hyaline casts were present. Trichloracetic acid is a powerful escharotic, so care should be taken in using it.

In the milk treatment of albuminuria, Gérard has recently shown[†] that no albumin coagulable by heat remains. Nitric acid gives a precipitate soluble in excess. Saturated sodium chloride solution gives a flocculent precipitate, increased by the addition of acetic acid. These reactions are characteristic of hemi-albumose or propeptone. Albumose is an intermediate product of the change of albuminoid bodies into peptone, and is stated to frequently indicate approaching nephritis.

A most sensitive test for albumin is that of Spiegler,[*] which is prepared as follows:—Mercuric chloride, 8 parts; tartaric acid, 4; glycerin, 20; water, 200 parts. The contact method is employed, and the urine is acidified first with acetic acid and filtered from mucus. It does not react with peptone, but precipitates alkaloids in precisely the same way as trichloracetic does, and if a considerable quantity of bile salts are present it will give a zone similar to albumin.

Salicyl-sulphonic acid has also been recommended as a delicate test. It is stated to precipitate 1 part in 100,000; the precipitate of albumin and globulin not being dissolved when heated, whilst albumoses and peptones dissolve.

In using the heat and acetic acid test, it is as well to remember that Dr. Stockman has shown that after taking balsam of Peru, tolu, etc., a precipitate is given, but which may be distinguished from albumin by its solubility in alcohol. It is suggested that it is a compound of the resin with glycuronic acid.

*Peptonuria.*—Healthy urine contains no peptone, but it has been found present in acute febrile diseases, and is regarded as an unfavourable symptom in nervous complaints. When albumin and globulin are absent, it is still possible that peptones may be present. The biuret reaction (dilute copper sulphate solution and excess of potash added to the urine producing a rose-red colouration) and the precipitate with picric acid, soluble on heating, are usually depended upon. But a form of proteose will give both of these reactions, so it is necessary to saturate the urine, faintly acidified with acetic acid, with ammonium sulphate, which precipitates albumoses, leaving the peptone in solution.

*Glycosuria.*—Most authorities are now agreed that sugar is present in traces, both in normal blood and urine. But we know that other constituents besides sugar in urine are capable of effecting reduction of Fehling's solution and similar tests. Dr. Pavy estimates that at least one-fourth of the reducing power of non-saccharine urines is due to uric acid alone, whilst creatinine, hippuric acid, and pyrocatechin account for a considerable amount. The administration of certain drugs, such as camphor, morphine, chloroform, chloral, etc., was formerly stated to produce sugar in the urine, but investigations have shown that the reducing body is glycuronic acid ($C_6H_{10}O_7$). This acid, besides reducing the usual tests, is also dextro-rotatory. It has very little clinical importance, and if due to drug treatment will disappear in time. It is curious that the yeast-fermentation method of estimating sugar in urine, which was discarded owing to its tediousness and inaccuracy, clearly distinguishes between dextrose and glycuronic acid. There can be no difficulty with diabetic urines, as besides the usual high density and pale colour of the sample, there is a diminution of uric acid and considerable quantity of sugar present; the average amount is usually over 4 per cent. It is with urines containing apparently about 0·5 per cent. of reducing substances that difficulty may occur. The separation of glycuronic acid is very tedious and unsatisfactory, so that when I have a sample containing a small quantity of reducing substances, which it is necessary to be sure is not dextrose, I always confirm by means of the fermentation test. Those who are in the habit of employing the bismuth reaction for sugar should note that, according to a writer in the *Pharm. Centralh.*, after the administration of either senna or rhubarb, the urine gives the sugar reaction. Fehling's solution is also decolorised, but without precipitation.

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[*] *Brit. Med. Journ.*, July 26, 1890, p. 197.

[†] *Pharm. Journ.*, [3], xxiii., p. 261.

[*] *Journ. Chem. Soc.* Aug. 1893, p. 399.

Through the kindness of Mr. A. W. Gerrard, I am able to show you his "Glycosometer," which has most of the advantages of Pavy's method for estimating dextrose in urine, without the objectionable ammoniacal fumes that are evolved from Pavy's solution. The burette is also graduated into percentages of sugar, thus saving the calculation necessary when using an ordinary burette.

*Urea.*—The average amount of urea in normal urine is about 2 per cent. In the early stages of fevers and in diabetes it is increased, whilst in chronic and wasting diseases and the convalesence of fevers it is diminished. I was surprised to see in a review[*] of Legg's 'Guide to the Examination of Urine,' that exception was taken to the hypobromite method of estimating urea as "disappointing and uncertain," the writer strongly recommending Liebig's method of titrating with standard mercuric nitrate solution after removal of phosphates and sulphates by means of barium nitrate. The corrections required and uncertainty of end-reaction in Liebig's method have yielded me results far more disappointing and uncertain than the hypobromite method. Dr. Halliburton, F.R.S., points out[†] that although the theoretical amount of nitrogen is not evolved by the hypobromite method, the graduation of Gerrard's or Dupré's apparatus is based upon the experimental fact that 5 C.c. of a 2 per cent. solution of urea evolves 35·4 C.c. nitrogen. He adds that this method is "far more accurate and easier" than Liebig's, and it is only where abnormal amounts of urates and of creatinine are present that the error is serious. When corrections are made for tension of aqueous vapour, to standard temperature and pressure, the results are strictly comparable.

*Uric Acid.*—Although during the past few years serious objections have been raised against Haycraft's method for estimating uric acid, the newer processes hardly appear more satisfactory. The latest experiments by Deroide[‡] indicate that the high results of Haycraft's method are due to the precipitation of compounds of the xanthine group besides uric acid. The tendency of uric acid to form concretions renders it a most significant pathological feature in urine. Sir William Roberts states[§] that uric acid exists only as quadrurates in normal urine, which appear sometimes as the amorphous urate sediment. The biurates occur as gouty concretions. Quadriurates in the presence of water and superphosphates in acid urine are decomposed with the liberation of free uric acid. This decomposition is prevented by mineral salts and pigment in urine. It is hastened by high acidity, diminution in mineral salts, increase of uric acid, and low pigmentation. Free uric acid is found in urine of uric acid diathesis, but the quantity is especially diminished in gout, where it accumulates in the tissues. During the "alkaline tide" there is considerable increase of uric acid, which, according to Dr. Haig, who has made uric acid[||] and its relation to disease a subject of research for several years, is merely a washing out of the acid accumulated between meals (acid tide). Sir William Roberts and Dr. Halliburton consider it due to increased metabolism, but Dr. Haig, in a letter to me, pertinently asks, if this is so, why is there no increase in urea? He has recently proved that under certain conditions, such as the administration of salicylate of sodium, any additional uric acid taken into the system will be wholly excreted during the following three or four days.

*Other Constituents.*—The toxicity of urine has lately attracted much attention, but the whole subject is in its infancy, and I have been unable to obtain a recognised plan for estimating the alkaloids and determine them separately, as recently recommended by Dr. Lauder Brunton, F.R.S. Some experiments in connection with this subject, as also an investigation of Ehrlich's diazo-reaction for typhoid fever, I may be able to offer at another time. Kobler, Brieger, and Luff have found leucomaines or ptomaines in urine from cases of infectious diseases, and have separated them as crystalline salts. Creatinine is the only alkaloid present in normal urine, but lecithine and choline are both present in bile. The presence of hæmatoporphyrin in urine is of interest, as it has been stated to occur after the administration of sulphonal. Dr. T. S. Adair informs me, however, that he has never seen a case at the Wadsley Asylum, although they give sulphonal sometimes in 60 and 70 grain doses, the average dose being 30 to 40 grains.

*Urinary Sediments.*—Pus in an alkaline urine appears as a ropy sediment, whilst in acid or neutral urine it is white and similar to phosphatic deposit. The production of a gelatinous mass with alkalis is Donné's test for distinguishing pus from mucus. It is also precipitated by mercuric chloride. The addition of acetic acid renders the nuclei of the cells distinct, and shows the granular corpuscles under the microscope. These corpuscles are coloured brown by dilute iodine solution, whilst epithelial cells are only tinged yellow.

*Mucus* may be separated from pus, if present together, by precipitating pus with mercuric chloride, filtering and adding acetic acid, which precipitates mucin. Mucin is precipitated by acids, alcohol, and alum, but is dissolved by alkalis and not affected by mercuric chloride.

*Casts* are of cylindrical shape as moulded by the renal tubules. They only occur in renal disease, although Charcot held that hyaline casts might be present in normal urine, and epithelial casts follow the administration of diuretics.

The several varieties are now classed as :—

*Blood-casts.*—Contain a number of blood corpuscles and indicate hæmorrhage into the tubules. Present in hæmaturia.

*Granular.*—Opaque, yellowish or grey, and consist of disintegrated epithelial or blood corpuscles.

*Hyaline.*—Colourless, long and narrow tubes of "ground-glass" appearance. May be detected by the crystals of phosphates usually embedded in them. Constantly present in chronic albuminuria.

*Epithelial.*—Hyaline casts with epithelial cells attached.

*Fatty.*—Contain fat globules, which are highly refractive. Indicate fatty degeneration of the kidneys.

*Cylindroids* are long, ribbon-like bodies, resembling casts, only longer and twisted. If originating in the kidney they dissolve in acetic acid. Occur in gout, acute infectious diseases, etc.

A useful method of examining urinary sediments is to add a drop of methylene blue solution to the deposit. This was recommended by Dr. Charles Rice about a year ago in an American journal, and it greatly assists the search for casts, epithelium, etc.

### SPUTUM.

The average chemical composition of sputum, according to Troup, is mucin 2, albumin and fat 1, extractives 2, inorganic solids 1, water 94.

The sputum in bronchitis is yellowish and very tenacious, owing to the presence of pus. In phthisis it may be yellow or tinted with blood. In pneumonia it is usually rusty brown, from altered blood pigment;

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[*] *Lancet*, Nov. 11, 1893, p. 1192.
[†] *Chemical Physiology and Pathology*, p. 811.
[‡] *Bull. Soc. Chim.*, [3], 7, p. 364.
[§] *Proc. Med. Chir. Soc.*, 1890, p. 85.
[||] 'Uric Acid,' by A. Haig, M.D., F.R.C.P.

as the disease progresses it frequently becomes purulent.

Sputum of pneumonia is most viscid, that of bronchitis most watery. The proteids and extractives in pneumonia are much higher than in phthisis.

Epithelium, mucus and pus cells are constantly present. The presence or absence of yellow elastic tissue is of considerable importance. A portion of sputum is boiled with an equal quantity of caustic soda solution (20 grs. in a fluid ounce of water), stirring frequently. Directly complete fluidity is observed, it is removed and diluted with four or five times its bulk of cold water and poured into a conical glass. After fifteen minutes pipette out undestroyed tissue and examine under the microscope. It is frequently present in acute phthisis, whilst in older stages of the disease encrusted fragments of the tissue may be found.

For the examination of sputum suspected to contain tubercle-bacilli, the expectoration should be collected the first thing in the morning before any food has been taken. Special care should be exercised so that extraneous matter is excluded. The opaque white particles most frequently contain the bacilli. Several methods for staining and mounting tubercle-bacilli have been given in the useful column of the *Pharmaceutical Journal* devoted to microscopy. The method I have used is briefly as follows:—With the aid of a scalpel, a particle is placed on a clean cover-glass and a second cover-glass applied face to face with a slight rubbing pressure, so as to ensure a thin, even layer on each. Slide the glasses apart and dry by gently warming. Holding the cover-glass film upwards, pass it carefully and quickly through a Bunsen flame three or four times to coagulate the proteids. It is now ready to stain. Heat some carbolic-fuchsin (for formula see Squire's 'Methods and Formulæ'), and when steaming float the cover-glass, film downwards, in it for ten or fifteen minutes. Remove and immerse in dilute sulphuric acid containing about 20 per cent. of strong acid. Wash well in water, and if more than a light red colour left, decolorise again in acid and wash with water. Place two or three drops of methylene blue solution on the film, and allow to remain two or three minutes, wash well in water until no more colour is removed. Dry thoroughly by warming, and mount in xylol balsam. It should be remembered that results are very frequently negative as regards the presence of tubercle-bacilli. Several examinations are therefore necessary as the disease progresses, if the physical signs still point to tuberculosis. On more than one occasion, although unsuccessful in finding the bacilli, I have detected *Micrococcus tetragonus*. As this is often present in phthisical subjects, and was accompanied with yellow elastic tissue, the diagnosis was clear. While the discovery, therefore, of tubercle-bacilli in the sputum is held as positive evidence of the presence of tubercular disease, a negative result by no means proves the absence.

At the close of the paper Mr. Millard introduced Mr. Angus, Pathologist at the London Hospital, to the audience, and Mr. Angus then gave a practical demonstration of mounting and staining tissue and sputum. He first froze a portion of a "gin drinker's" liver, and then cut sections from it, some of which he stained with picro-carmine and others with hæmatoxylin. After these had been mounted in Farrant's medium they were exhibited under the microscope. The method for treating sputum as explained by Mr. Millard was then shown, the sputum used being that from a phthisical patient, and it showed the tubercle bacilli very distinctly under a $\frac{1}{12}$ in. oil immersion lens. Numerous other slides were also exhibited, and in the discussion which followed, the President said how needful it was for men to be really well up in the subject of urine analysis before they were able to arrive at any valuable results. Pharmacists already did one-half of the work for physicians by preparing their solutions and devising their apparatus, but the physicians on the other hand did a very large proportion, for they applied the results to the cure of disease, whereas if a pharmacist undertook the analysis, he could do no more than state his results.

Mr. Millard was asked questions by several members, and after he had replied and a vote of thanks had been tendered to Mr. Angus for the trouble he had taken to so fully illustrate the paper by his demonstration, the meeting terminated.

# Scottish Transactions.

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, December 21, the business to be brought forward was to discuss the advisability of drafting a code of ethics, and also to decide the form of annual social meeting to be adopted. Mr. W. L. Currie, the President, being indisposed, and none of the vice-presidents present at the opening of the meeting, Mr. Jas. Robb was called to the chair. Ethics seemed an uninviting subject, even in conjunction with the annual social meeting, as few members were in attendance, and the discussion soon fell through. A suggestion by the Secretary for the registration of all shops wherein drugs were retailed, and no new ones to be opened until they had been registered, or otherwise an annual licence for druggists, was the only observation that received favour from several speakers, but it was outside the sphere of ethics. In the second part of the proceedings a dance found favour with the majority, and arrangements have to be made for such form of entertainment. Mr. Bryce Barr, Largs, and Messrs. McGregor, Weatherston, Burns, and Beveridge, all of Ayr, joined the Association.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The fourth meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, December 20, at 9.15 p.m. Mr. Alexander J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, Mr. David Mathewson read some "Notes on Ferns," in which he dealt very fully with the structure and life history of ferns; their distribution, habits, and collection; the folk-lore associated with them; and their uses in the arts, as dietetics, and in medicine. He also exhibited a few of the better known British species.

Mr. Donald McEwan exhibited and described a few of the "Recent Additions to the Herbarium," including a specimen of canary grass, *Phalaris canariensis*, which has now become quite common in the neighbourhood of Edinburgh. He also read an interesting note on "Labels," illustrated by a collection of specimens indicating both commendable and reprehensible practices in this department of a pharmacist's work, the importance and significance of which he strongly emphasised.

The reading of the papers was followed by a discussion, taken part in by Messrs. Dey, Henry, Hill, McEwan, Mackenzie, Macpherson, and Mathewson, and on the motion of the Chairman, cordial votes of thanks were awarded to the authors.

# Parliamentary and Law Proceedings.

### POISONING BY PRUSSIC ACID.

At the Board Room, Ebury Bridge, Pimlico, on Friday, December 22, Mr. John Troutbeck, the coroner for Westminster, held an inquest on the body of Wentworth Francis Dean Paul, aged twenty-three, second son of Sir Edward Dean Paul, who committed suicide by drinking prussic acid at the Bath Hotel, Piccadilly, on the previous Wednesday. The evidence showed that the deceased returned a fortnight ago from a visit to Chicago, and had been depressed owing to pecuniary affairs. He obtained half-an-ounce of prussic acid cn the pretence that he wanted "sufficient to poison a large dog," and he was afterwards found dead in bed with a small phial which had contained prussic acid lying by his side. The jury returned a verdict of "Suicide while temporarily insane."—*Times.*

### POISONING BY LAUDANUM.

Major Taylor, coroner, held an inquiry last week at the New Inn, Pontefract, on the death of Elizabeth Summers, aged thirty-two, who had been drinking on Monday, December 18, and shortly after six o'clock went to the house of a Mrs. Guy, a neighbour, and showed her a bottle containing laudanum. She said she would not breathe another day on earth, and that she was sick of life. She then went away, and Mrs. Guy shortly afterwards followed her to her house, and found that she had drunk the contents of the bottle, and was in a drowsy state. Medical aid was summoned, but she died at 2.30 a.m. The verdict was "Suicide while in an unsound state of mind."—*Leeds Mercury.*

### POISONING BY STRYCHNINE.

Dr. G. Danford Thomas, on Tuesday, December 26, held an inquest at the Hampstead Provident Dispensary, on the body of Mary Ingham, aged twenty-one, a domestic servant in the employ of Mr. Adam Miller, of Deanshurst, Parliament Hill Road, Hampstead. The evidence showed that deceased on the previous Friday told Miss Miller that she had taken sixpennyworth of poison, and informed a fellow servant that it was mouse poison she had taken. Dr. W. Boulting, of Heath Street, was at once sent for, and by his direction she was conveyed to the Hampstead Home Hospital, where she died soon after admission, the symptoms being those of strychnine poisoning. She had been strange in her manner of late, and was under the delusion that people were watching her about. The jury returned a verdict of "Suicide whilst of unsound mind," and added a rider expressing their opinion that regulations should be adopted to prevent the ease with which strychnine can now be obtained at oil-shops.—*Standard.*

### POISONING BY OXALIC ACID.

On Saturday, December 23, Edward James Goodwin, of Dudley Street, Birmingham, carter in the employ of Messrs. Walter Showell and Co., committed suicide by taking oxalic acid. He had not been well lately, and on Saturday went to Mr. B. Willis, chemist, and purchased a pennyworth of oxalic acid, stating that it was to clean the brass on some harness. On his return home his wife discovered he had taken the poison, and help being procured, her husband was removed to the infirmary. Here he died shortly after admission. An inquest was held on the deceased on Saturday afternoon—before Mr. E. Docker, coroner—and the jury returned a verdict of "Suicide in a state of temporary insanity."—*Birmingham Daily Post.*

### POISONING BY LAUDANUM.

Mr. S. Smelt, deputy city coroner for Manchester, held an inquest on Tuesday last on the body of Charlotte Brodie, aged twenty-two years, a warehouse employé, who lived in Renshawe Street, Hulme. The evidence showed that the deceased, who had been ill for about a month—since the death of her lover, to whom she was engaged to be married—had taken laudanum, and the jury returned a verdict that the deceased had committed suicide whilst insane.—*Manchester Guardian.*

### POISONING BY WHITE PRECIPITATE.

On Saturday, December 23, the Ipswich borough coroner held an inquest in the Mission Room, High Street, on the body of Catherine Jacobs, wife of Thomas Jacobs, a bricklayer, of 33, Chenery Street. The deceased, while suffering great pains on the previous Thursday morning, sent her little boy to a chemist for a packet of white precipitate powder, the contents of which she took.

The coroner, in opening the inquiry, called the attention of the jury to a very important decision as to the obligation which the law cast upon those who dealt in poisons. It had been decided that any unregistered assistant to a chemist who sold any poison or any preparation containing poison, as defined in the Pharmacy Act—and it appeared that the poison deceased was alleged to have taken had been added to the Act by a resolution passed by the Pharmaceutical Society in 1869—was liable to a penalty notwithstanding that he effected the sale on behalf of his master, and that his master was duly qualified. One learned judge in giving his decision had remarked that the object of the Act was to provide for the safety of the public, guarding, as far as possible, all members of the community from the disastrous consequences so frequently occurring from the sale of poisons by persons inadequately acquainted with their baneful properties. The whole object of the Act would be frittered away, and the Act become a dead letter if unqualified assistants were allowed to sell any of the poisons to which the Act applied; unless upon each occasion of sale such assistants acted under the personal superintendence of a qualified employer, or a qualified assistant. The judges held that personal superintendence did not mean mere presence in the shop where the sale took place, but real personal superintendence so that every individual would be guarded by these precautions. The coroner went on to remind the jury that there were two classes of poisons dealt with in the schedule to the Pharmacy Act. In the case of poisons mentioned in the first part, a chemist was required to take, in writing, the name of the buyer, and to go through other formalities. In selling poisons mentioned in the second part, they must be labelled with their description, and the name and address of the seller. "White precipitate"—ammoniated mercury—was in the last-named part of the schedule. The question for the jury to consider was what was the cause of death, and—if they found from poison—under what circumstances it was taken. Was it taken to alleviate pain, or to destroy life?

Frank Jacobs, aged 10½, said that on Thursday morning, between eight and nine o'clock, his mother told him to go to the shop of Mr. Anness, and get a "precipitate" powder. He did not know for what purpose she wanted it. He went to the shop, and a lad (the apprentice) served him. The lad did not ask him what it was for. He had been to the shop several times before, but not previously for "white precipitate." Witness returned home at once, and gave it to his mother, who was lying in bed at the time, and told him to get the feeding cup, which was half full of milk. His mother put the whole of the powder into the milk, and drank nearly half. After he had taken the cup from his mother he called the nurse, because he saw on the paper the word "poison."

Susan Howard, the nurse, said she had been attending Mrs. Jacobs three weeks. On Thursday morning she heard the boy scream. She asked the deceased what she had been doing, and deceased replied "she could not bear the pain any longer." Mrs. Mitchell sent for the doctor immediately on her arrival.

Mr. R. W. Brogden, surgeon, deposed that he had been attending Mrs. Jacobs since the beginning of the month for a very painful malady of the legs. He was at home when the summons came on Thursday morning, and went to the house at once. He administered an emetic, which was followed by copious vomiting. He believed that the deceased died from the results of her long illness, accelerated by diarrhœa, caused by the powder. He had ascertained that each packet of powder contained a drachm. He did not know what was the smallest dose that had proved fatal. He produced the part of the mixture left in the cup, with the little taken from the mouth of deceased. He did not think that she had swallowed more than half a drachm.

Harold Pyne, apprentice to Mr. Anness, having been cautioned by the coroner, said he had been indentured fifteen months. He did not recollect having served the little boy on Thursday morning, but he had often seen the little boy in the shop. Mr. Anness was in the shop every morning between eight and nine o'clock—the time when the little boy said he came. It was his practice when a customer wanted "white precipitate" or any other poison to refer them to his master or to Mr. Anness, jun.

Mr. S. R. Anness said he was in his shop between eight and nine on Thursday morning, but he might have left it for a minute or two to go into the dining-room. He could not remember having served the boy. The sale of these white precipitate powders, however, was such a common occurrence that if he had sold it to the boy he should probably not have remembered it. He sometimes sold a dozen of these packets in a day. In accordance with the requirements of the Pharmacy Act, each packet bore on it a label, stating what it contained, with the word "poison" and his name as seller. He ordered his apprentice if he were asked for such a packet, to get it, and bring it to him (Mr. Anness) or his son (who was fully qualified), and one of them would hand it to the customer. If the apprentice had sold a packet direct he had disobeyed orders. These packets were constantly being sold, and it was not an unusual thing for him to be called from the breakfast table to hand a packet to a customer. The preparation was an ordinary one, most frequently used for cleansing the hair. Chemists were under no restriction as to whom they sold it, and so far as his experience went they were sold more frequently to children than to grown up people, mothers sending their children for a packet. If he had been in the shop he should have sold a packet to the boy, and he could not swear he had not done so.

The coroner, in summing up, emphasised what the doctor had said as to the cause of death. In regard to the state of mind of the deceased when she took the poison, he recapitulated what he had said at a previous inquiry—that the law assumed a person to be sane until there was evidence to the contrary, and that the act of suicide was not *per se* an act of insanity. He asked them to consider also whether the apprentice was culpably negligent, and further, whether there was any neglect, and if so, of what character, in leaving a lad—as the other boy suggested the apprentice was left—in charge of such deadly drugs. He added that, although the Act prescribed a penalty if its clauses were infringed, that would not be an answer where death was found to have arisen from culpable neglect.

The jury, after a very short deliberation, returned a verdict that "The deceased committed suicide during temporary insanity."

The coroner said that view of the case was unsupported by any evidence. He asked the jury to reconsider their finding. If, after full deliberation, they remained of the same opinion, he would be compelled to accept it, but he felt a difficulty in taking a finding which, he thought, was unsupported by evidence, and was so quickly arrived at.

One of the jurymen said they believed that the deceased was affected by the intense pain, but the coroner replied that extreme pain would not justify self-destruction.

The jury, after a further consultation, desired a post-mortem examination of the body. The inquiry was thereupon adjourned to the Town Hall on Thursday evening.

The coroner thanked Mr. Anness for his readiness to afford all possible information and assistance at that inquiry.—*East Anglian Daily Times.*

### PROCEEDINGS UNDER THE FOOD AND DRUGS ACT.

Benjamin Moate, chemist and druggist, Summer Lane, Birmingham, was charged under the provisions of the Food and Drugs Act, at the City Police Court, on December 22, with selling a quantity of nitrous ether which did not contain the standard amount of "ethyl nitrate" demanded by the Pharmacopœia.

Mr. Glaisyer, who defended, took exception to the word "nitrate," and submitted it should have been "nitrite." He also objected to the emendation of the summons, which necessarily was dismissed.—*Birmingham Gazette.*

### PROSECUTION UNDER THE FOOD AND DRUGS ACT.

#### SALE OF PRECIPITATED SULPHUR.

Joseph Brearley, chemist, 26, St. James's Road, Halifax, was charged under the Food and Drugs Act, last week, with selling an adulterated drug. He pleaded guilty. Mr. D. Travis, sanitary inspector, stated that on November 3 Mr. Albert Edward Hudson, inspector under the Act, went to the defendant's shop and asked for two ounces of precipitated sulphur, for which he paid 2*d.* After securing the purchase he told the defendant that it was for analysis, and he divided the sulphur into three parts, leaving one-third of it with the defendant. The other two parts he gave to Mr. Travis, who handed one of them to the Borough Analyst for analysis. The result of the analysis was that it was found that the precipitated sulphur was adulterated to the extent of 74·34 per cent. with sulphate of lime. In defence, defendant said he sold it just as he bought it. A fine of 10*s.* and 5*s.* 6*d.* costs, or ten days, was imposed, defendant promising to be more careful in future.—*Halifax Evening Courier.*

## Reviews and Notices of Books.

### A MANUAL OF MEDICAL TREATMENT OR CLINICAL THERAPEUTICS. By J. BURNEY YEO, M.D., F.R.C.P.*

The author of this work states that his object is to teach therapeutics from a clinical standpoint rather than as an abstract science. The result is a text-book in which the natural history of disease is sketched in outline, whilst the sections on treatment are full and detailed. The title might wel have been

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* London: Cassell and Co., Limited. 2 volumes. Pp. i.-xiii., 1 to 631, and i.-vi., 1 to 744. 21*s.*

"Applied Therapeutics," as opposed to the treatises on pure therapeutics. Such a work is happily conceived and, if well executed, likely to prove of great service to senior students and to practitioners. On the whole Dr. Yeo has successfully accomplished his task, and the two compact volumes constitute a useful addition to medical literature. A few defects may, however, be pointed out. The detailed description of an operation such as gastrostomy seems out of place in a work of this kind. The treatment of rectal alimentation is unsatisfactory. It is distributed over various parts of the book, and the quantity and composition of nutritive enemata are not described with the clearness that could be desired. For instance, the directions given by Daremberg are related in a manner likely to give the reader a headache instead of ready help:—"Into a glass or other suitable vessel introduce 7500 grains of meat as lean as possible, minced fine; pour on this about 100 ounces of pure water and an ounce of hydrochloric acid of a density 1·15. To this add 40 grains of the purest and best pepsine. Digest this mixture for four hours at a temperature of 112° F. Then pour it into a vessel of porcelain and let it boil, adding meanwhile a solution of bicarbonate of soda (17 grains to the ounce) until the mixture has a slight alkaline reaction; this will require 5 to 6 ounces of the solution. Strain the liquid through fine linen and express the insoluble residue; then concentrate the whole in a *bain marie* to 50 or 60 ounces. Half this is given by the rectum daily."

While, as stated above, the operation of gastrostomy, which is never required as a sudden emergency, is described in some detail, that of laryngeal intubation is merely mentioned in connection with diphtheria, and is not even named in the section on œdema glottidis. This should be regarded as a serious omission. Again, iodide of potassium is recommended in chronic Bright's disease, and a formula of Semmola's is given for administering 15 grains of this drug in twenty-four hours. Such directions are unsafe without a caution. Serious cases of iodism have occurred in adults suffering from renal cirrhosis when the dose has been no larger than is here advised. In the index there are a few deficiencies. For instance, there is no reference to the word "leech,' and under "Pleurisy, leeches in," the reference to page 103 should be to page 101. The efficacy of leeches in relieving pain in some cases of pleurisy is duly noted, but the modes of applying leeches are apparently nowhere discussed. Those who have suffered the agony of dysenteric proctitis know the inefficacy of small enemata, such as the author recommends (20 minims of laudanum in one ounce of cold mucilage of starch), whilst the larger enemata of mucilage of linseed free from seeds give complete relief. Whilst it seems necessary to point out what appear to be defects in the work, it can be commended as, on the whole, a practical guide. The formulæ given are for the most part simple and good, and the chemist and druggist will feel grateful to the author for recommending old-established drugs which are in the Pharmacopœia, and resisting the modern tendency to employ outlandish and overpuffed transatlantic products which appear now and again in a prescription, necessitating the purchase of a stock of some preparation which has no special use, may never be asked for again, and may cost ten times as much as is brought back by the single prescription for which it must be acquired.

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## LES NOUVEAUX HYPNOTIQUES, ÉTUDE EXPERIMENTALE ET CRITIQUE. Par Dr. GEORGES HOUDAILLE.*

The names of many new drugs appear from time to time in current medical and pharmacological literature, and to the mass of practitioners remain for the most part but names, the bromides and chloral being retained in undisputed possession of their place and rank. Thus the work before us appears opportunely. Eighteen of these new drugs, including the more familiar, such as sulphonal, paraldehyde, and hyoscine, are considered in detail. The mode of preparation, chemical constitution, effects on animals, as well as the clinical effects and indications are carefully described. With regard to sulphonal, the author concludes that the drug is at the same time useful and dangerous. Whilst in most cases it produces sleep efficiently, and as far as can be seen harmlessly, in a few instances it appears to have caused pathological changes in the blood or in the nerve-organs. Eleven cases of death attributed to this drug have been collected. According to Yvon, two kinds of paraldehyde exist in commerce: one solid at 0° C., to be regarded as impure; the other solid at 10° C., alone deserving the title pure paraldehyde. The fatal dose of paraldehyde for dogs is about 2 grammes per kilogramme of the animal's weight. The animals become anæsthetised and lose their reflexes. The pulse and respirations are slowed, the blood pressure falls. Five grammes of paraldehyde have been given to men without disagreeable results, and the dose has been gradually increased to as much as 10 grammes by de Vicente. The author has been able to find no record of fatality resulting from the administration of paraldehyde, though in two cases Nercam noted syncope. In the immense majority of cases, paraldehyde must be regarded as a harmless drug of purely hypnotic properties. Comparing paraldehyde with chloral, M. Houdaille points out that the former is less irritating, and so better tolerated by the stomach and the pharynx. Paraldehyde is not a cardiac poison. It is less analgesic than chloral, and hence is inferior to the latter drug, and still more so to morphia for insomnia due to pain. On the other hand, in nervous insomnia, and especially in that caused by abuse of alcohol, paraldehyde is far superior to chloral. The work of Horatio Wood, Hyde Hills, Colman, Taylor and others is referred to in connection with hyoscine and hyoscyamine. While Colman and Taylor have (the author states) given the former drug in hypodermic doses of 10 to 15 milligrammes of the hydriodide, the author agrees with Konrad that the maximal hypodermic dose of both these drugs should be ½ to 1 milligramme

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* Paris: Baillière et Fils. Pp. 240. 8vo. 5 francs.

This is a matter of some importance, since these drugs are extensively used for obtaining sleep in cases of delirium tremens. Mitchell Bruce gives as the dose of hydriodide hyoscine "$\frac{1}{100}$ to $\frac{1}{50}$ grain or more." The chief facts established with regard to many other hypnotics and reputed hypnotics are also carefully collected. The author gives in tabular form the result of his own extensive and interesting series of observations of the effects of various hypnotics upon tench—very hardy fish: "poissons très resistants." The work constitutes a valuable addition to the literature of therapeutics, toxicology, and pharmacy.

## Obituary.

Notice has been received of the death of the following:—

On December 13, Sidney Smith, Chemist and Druggist, of Urmston. Deceased was a member of the Society.

On December 20, William Barratt, Chemist and Druggist, of St. German's, King's Lynn. (Aged 41 years.) Mr. Barratt joined the Society as an Associate on passing the Minor examination in 1884, and retained his connection with the Society till his death.

On December 23, Richard William Williams, Chemist and Druggist, of Liscard. (Aged 50 years.)

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### What is meant by Pil. Opii?

Sir,—The consideration of the subject, "When is a dispenser justified in departing from the strict letter of a prescription?" could not be more aptly centred than on the question raised by "Major"—What should be dispensed for pil. opii gr. ½, terties horis. sd. Is the dispenser bound by the authority of the B.P. to send pil. saponis co., or is he at liberty to assume that the prescriber means that which he does not write, viz., ½ grain of opium in each pill? Mr. Gane and "Major" take the former view, and call that the safe side; but there is no safe side in this case apart from actual knowledge of the prescriber's intention, for equally serious consequences might result from giving $\frac{1}{12}$ grain only of opium when ½ grain was urgently needed as from the reverse. I maintain that the safe side is in all cases to aim at the intention of the prescriber; this involves the exercise of the best judgment of a good dispenser, no definite rule can be laid down. Hasty conclusions and unnecessary alterations should be avoided; each case must be considered in all possible aspects, and the man who has had most experience at the dispensing counter, and who is best acquainted with the customs of prescribers, is least likely to err in appreciating the writer's intention. The first series of replies (*ante*, pp. 419-420) indicates a unanimous impression that ½ grain of opium was meant. Accepting this as the opinion at the dispensing counter, I thought it would be instructive to find whether the views of medical practitioners point to the same conclusion. I have therefore submitted the question to a number of medical men, mostly busy prescribers in extensive local practice, but including consulting physicians, a veteran who took his degrees fifty years ago, and a young doctor whose diploma has not seen its first anniversary. The collective opinions of such must form a good indication of what doctors expect from dispensers. Of the seventeen very courteous replies to hand, not one assumes that the prescriber really meant pil. saponis co. Three say the safe plan would be to send pil. saponis co. Other four are convinced that ½ grain of opium was meant, but assuming the writer cannot be interviewed, the dispenser had better send pil. saponis co. The remaining ten are sure that ½ grain opium in each pill was intended, and certainly should be so dispensed. More important still is the tenour of some of the replies—"I frequently prescribe pil. opii gr. ½, intending half a grain of opium in each pill. I should be much surprised at a chemist making it up in any other way." Another—"When I order pil. opii gr. ½, I quite expect half a grain of opium alone to be used. I have been in the habit of writing this for fifteen years." The doctor's view of how a dispenser's discretion should be applied is illustrated by "I think the intention was ½ grain opium, but if I were a chemist I should refuse to dispense it, as it might be almost as dangerous in a bad case—say of peritonitis—to give too small a dose of opium as in another case to give too much. On the whole I should regard this as a case in which a dispenser was not justified in acting on his own discretion, and the only safe course (if the prescriber cannot be seen) would be to send pil. saponis co.;" also—"I do not think there is any hard and fast rule to go by. In the interpretation of this as of every prescription the question is what does the prescriber mean? Every chemist must exercise his judgment about a particular prescription; a homœopathic doctor might intend $\frac{1}{12}$ grain opium for an adult. It certainly would not be right to dispense such a prescription, written by a doctor you knew, and who ordinarily prescribed in average doses, according to the strict letter of the prescription, viz. ½ grain of pil. saponis co. It might make the difference of life and death to the patient whether he got $\frac{1}{12}$ or ½ gr. of opium for a dose." The collective opinion points clearly to the probability that half a grain of opium in each pill was meant, but there must remain the very remote possibility that the writer of "Major's" prescription was "the exception and not the rule."

35, *Clifton Road, Maida Vale.* R. H. Parker.

### Code of Ethics.

Sir,—It is evident that a code of ethics for pharmacists is regarded generally as being desirable. So far as I can learn, no objection has been urged against it, beyond the difficulty of formulating and applying it. That, no doubt, is very considerable, but surely it is not overwhelming. When there is very good reason for expecting that its realisation would result in pharmacists being evolutionised from a heterogeneous mob into a well disciplined army of skilled workers, on whom, for the well-being of the community, the Legislature would be bound to confer the whole labour of pharmacy, sufficient encouragement is given for us to strive resolutely and doggedly to bring it about. Without delay associations should discuss, in a methodical manner, the various matters sought to be dealt with, so that our conceptions of the morality or otherwise of lines of procedure may become more nearly accurate and unanimous. This would furnish material and enable the Council or a committee to construct a code which would be approved of generally. It must not be forgotten that our first concern is to have the work of pharmacy executed as it ought to be; remuneration undoubtedly does concern us, but that is secondary, and we act infamously when we allow ourselves to give it the first place. Though at present the Council has not the power of erasing names from the Register for ethical reasons, it might, under a new Act, get that power conceded to it, as in the case of the General Medical Council. Outsiders generally, so far as I have been able to gather opinions, express surprise that up to this time the whole practice of pharmacy has not been confined to qualified individuals governed in the manner referred to, and it would appear to be our own fault that it is not so.

*Glasgow.* J. Anderson Russell.

### The Microscope in Pharmacy.

Sir,—Referring to the very interesting paper read by Mr. Austin, of Sheffield, and reported in your issue of 15th inst., I consider that pharmacists are greatly indebted to such accurate observers who, by persevering study, prove that the infinitely minute and the infinitely great are united by inseparable links, as expressed by Pope—

> "All are but parts of one stupendous whole,
> Whose body nature is, and God the soul."

More than half a century spent in the study and practice of pharmacy convinces me that the only real enjoyment to be derived from the business of a chemist and druggist is by assiduously cultivating a knowledge of the science and literature appertaining thereto. The pharmacist is often appealed to by his customers and friends for information respecting the substances he deals in, and the ability he shows in giving information and explanation tends to secure for him the confidence and esteem of intelligent people. I like Mr. Austin's recommendation, "carry a lens in your pocket," it has been my practice as long as I can remember. I have a triplet which I have never parted with for the last thirty-six years. It is a most agreeable companion at home or abroad. Many a time, when in a garden or walking in the country, has the little instrument awakened the astonishment and admiration of men, women, and children. To demonstrate that the common rush is a poor relation of the gorgeous lily, and tell them how to prove the fact, may have developed some insipient botanist into a teacher of others. The reader's notes on mould, mites, etc., are important, and show what sedulous attention should be used in keeping stock, which when once invaded by parasites soon becomes deteriorated or absolutely useless. Mr. Austin will not, however, be offended by my taking exception to the statement that "mites similar to those found in cheese attack cantharides, and in a surprisingly short time render them absolutely worthless." Dr. Pereira states that the acarus which attacks cantharides is a discriminating little animal, for it devours only the nutritious portions of the insect, carefully avoiding the vesicant principle. So also does the weevil that perforates calumba root seek out the starch granules, leaving the bitter extractive intact. A case in point occurred many years since. On opening a parcel of cantharides that had been overlooked and became rather damp, it presented a sad appearance, but illustrating the great law of nature—life evolved from death. The mites were sifted out and the cantharides weighed, the loss estimated by comparison with a recent sample. The tincture produced was equal to the P.L. preparation.

*Kingston-on-Thames.* R. GOODWIN MUMBRAY.

## PERCENTAGE SOLUTIONS.

Sir,—As Mr. A. Cruikshank's query on the above subject was written at my instigation, and as another query has been put by Mr. W. Spencer Turner, Manchester, perhaps I may be allowed to make a few remarks. I have always held that in attempting to introduce into the 1885 Pharmacopœia "a method of setting out the relative quantities of ingredients used in some of the processes, by supplementing the respective weights and measures by apportioned parts," the General Council of Medical Education and Registration of the United Kingdom acted neither wisely nor well. The embroglio into which Macpherson, Edinburgh, became involved fully illustrates this contention. Macpherson's abstruse reasoning on an exact 1 per cent. solution, although not so learned, was as ridiculous as the discussions of long ago divines as to how many angels could dance on the point of a needle. Nobody cares. But the admission of the principle of percentage into the Pharmacopœia is matter both of concern and annoyance to everybody. The 1867 Pharmacopœia (solids by weight, liquids by measure) was satisfactory enough, for the simple reason that in preparing as well as dispensing compounds, whatever might be the specific gravity of the fluid employed, the proportions remained constant—so many grains by weight in so many ounces by measure. But the adoption of percentage leads to confusion and vexation. A doctor orders, for example, liq. hydrarg. perchlor. 5 per cent., ʒiv. In this instance there is no great difficulty in preparing a fairly accurate solution, water at ordinary temperature being the standard of weight. The dispensing of the solution, as a present day novelist would say, is another story. It might puzzle a more experienced hand than the youngest apprentice to say how much of the mercuric salt is contained in a fluid drachm of the solution. If, as Mr. Turner suggests, the doctor should prescribe glycerin hydrarg. perchlor. 5 per cent., ℥iv., then who shall undertake accurately to prepare such a compound, far less to say what proportion the two bear to each other when measured? And so on all down the gamut of varying specific gravities and temperatures. In theory exact percentage solutions form a truly beautiful pharmaceutical idea, but so long as dispensing is effected by measures as at present in use, so long ought the beautiful to be discarded for the expedient, and the theoretical for the practical. With all deference I maintain that your editorial does not by any means settle the matter. You say that what is strictly meant by 1 in 100 or 5 in 100 is simply one or more parts by weight in so many parts by volume. The preface to the 1885 B.P. says that "the term parts signifies parts by weight" unless where fluid parts are stated. Professor Attfield, one of the illustrious editors of the Pharmacopœia, could set matters right. Were he to affirm that in the instances I have mentioned 5 grains or ounces by weight in 100 minims or fluid ounces of water, glycerin, spirit, or whatever the solvent might be were right and proper all dubiety would cease.

*Dunfermline.* JOHN H. FISHER.

## DISPENSING DIFFICULTY.

Sir,—It appears to me that this question (*re* pil. opii) is being discussed upon a misconception. I have yet to learn that pil. opii is official in the B.P. That it is a "synonym" does not admit of doubt; but it stands there, as a reminder only, that such was the official designation in 1864, and is in no way intended to supersede the title "Pil. Saponis Co. of the B.P., 1885," and when a prescriber orders pil. opii, gr. ¼, to my mind there can be no question of his intention. Quite recently I had a prescription of a like nature, viz., pil. opii gr. i statim. Without hesitation I made up gr. i pulv. opii into a pill and sent it out. I would remind your correspondent that members of the medical profession who are, or who have been, engaged in hospital practice frequently adopt this method in their private practice, thus effecting a saving of time to a busy man when writing a prescription in a hurry. One of your correspondents suggests that "the pharmacist is not a thought reader;" probably not, but he is, nevertheless, expected to act with intelligence and discretion, and not as a mere animated machine, governed by some imaginary red tapeism; he cannot always carry out the letter of the prescriber, but he can act up to the spirit of his instructions, and do his duty, by accepting that measure of responsibility which does rest upon him.

*Brighton.* G. G. HORNSBY.

## Books, etc., received.

ANIMAL AND VEGETABLE FIXED OILS, FATS, BUTTERS, AND WAXES: their Preparation and Properties, and the Manufacture therefrom of Candles, Soaps, and other Products. By C. R. ALDER WRIGHT, F.R.S., D.Sc. (Lond.), B.Sc. (Vict.). Pp. i.-xvi., 1 to 570. With 144 illustrations. London: Charles Griffin and Company, Limited. 28s. From the Publishers.

HANDBOOK ON THE USE OF COMPRESSED OXYGEN. By KENNETH S. MURRAY, M.I.Mech.E. Pp. 82. 1s. 6d. London: Ede, Dearberg and Co. From the Publishers.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Fielding, Hill, Jaworowski, Kemp, Laing, Nagelvoort.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, JANUARY 6, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## ANNUS PHARMACEUTICUS, 1893.

DURING the past year considerable progress has been made towards an interpretation of the Pharmacy Act, 1868, more reasonably consistent with the main object of that measure than the views which hitherto prevailed, and at the same time capable of being rendered more justly conducive to the protection of the material interests of registered chemists and druggists than the practice which has been generally continued since the passing of the Act. The anticipations that were entertained on this subject at the close of the previous year have been very largely confirmed by the judicial decision of questions raised as to the construction of the Act, and there is reason for believing that while its several provisions are being more vigorously enforced for the purpose of preventing infringements so far as public safety is concerned, chemists and druggists are generally becoming convinced that it is conducive to their interest, no less than their particular duty, to conform to the provisions of the Act and support their general application.

**PHARMACY LAW.**

In proceeding beyond this general statement to deal more in detail with the events of the past year, the result of the appeal in the case of the Pharmaceutical Society *v.* PIPER claims attention in the first place as being of chief importance. The very emphatic confirmation of the judgment delivered by his Honour Judge BACON when the case was first heard by him was of the greater significance since the arguments of the appellants' counsel were of a particularly plausible nature, and both judges were at first favourably impressed by them. But more thorough consideration of the object of the Pharmacy Act naturally counteracted those impressions. No question was then raised as to the immunity of "patent medicines" properly so called, but it was perceived that if such immunity were extended to the retailing of proprietary medicines, the whole mischief which the Act was intended to provide against would be allowed to continue, and any unqualified person might sell or even compound preparations containing poison. The arguments that the provisions of the Act apply only to poisons pure and simple, and that a statutory poison is not a poison when mixed with other ingredients, were equally unsuccessful. On these two points both judges concurred in deciding against the appellants, although it was not very clearly recognised that in several instances compounds containing statutory poisons—preparations of those poisons—are in fact included in the poison schedule. The two points of Judge BACON's decision were thus fully confirmed—first that the term "patent medicine" in the Act does not apply to preparations which are not the subject of Letters Patent, and, secondly, that a preparation containing poison as an ingredient is itself a poison within the meaning of the Act.

So far, therefore, the authority of the High Court of Justice has been exercised in support of the view that the several articles comprised in the poison schedule of the Pharmacy Act as poisons are, in the eye of the law, to be deemed poisons, however they may be dealt with in retail transactions, either when sold pure and simple or when forming ingredients of compounds, together with other substances. In all such instances the poison label must be used, and the articles thus coming within the provisions of the Pharmacy Act can only be sold by registered persons.

**PATENT MEDICINES.**

It still remains to be decided whether the application of that view is to be limited to transactions uninfluenced by the special privileges conferred by Letters Patent, and carried out in the ordinary course of retail trade. Considering the object of the Pharmacy Act, 1868, it may be inferred *primâ facie* that its provisions in regard to the sale of poison are to be applied absolutely. The Act does not pretend to regulate the sale of all poisonous articles; but merely to provide for public safety in a practical way by declaring certain articles to be poison within its meaning, and the retail sale of them to be subject to certain specified restrictions. But in this respect the exemption of patent medicines provided for by the 16th section of the Act is still a source of difficulty. If that exemption were to be interpreted absolutely, common sense would suggest that it could only have been intended to apply to medicines which were the subject of Letters Patent at the passing of the Act. They were then already in possession of a privilege which the Act could not abrogate, however much its exercise might be inconsistent with the provisions of the Pharmacy Act. But if the exemption of patent medicines admits of such an interpretation retrospectively, it seems impossible that the same view could have been entertained as to its prospective application without assuming that the Pharmacy Act contains a provision which would have the effect of very largely, if not entirely, defeating the object for which the Act was passed. It is much more reasonable to suppose the Legislature to have intended that after the passing of the Pharmacy Act the grant of Letters Patent for medicines containing scheduled poisons should become impossible. The exemption provided by the Act ought alone to be a sufficient reason for that view; but it is still further supported by the provision of the Patent Act that the protection afforded by Letters Patent shall not extend to anything contrary to law or prejudicial to the Queen's subjects.

Since the decision that the term "patent medicine" in the Pharmacy Act applies only to medicines which have been made the subject of Letters Patent, attempts have been made to take advantage of the privileges thus conferred for the purpose of securing the unrestricted sale of preparations containing poisons within the meaning of the Act.

In a prosecution under the Pharmacy Act of Ireland the general question as to the immunity of patent medicines was raised, and it was then decided that a preparation which has at any time been the subject of Letters Patent is entitled to be called a patent medicine. As a consequence of that decision it would follow that, according to the interpretation hitherto put upon the exemption of patent medicines, the sale of such a preparation would not be subject to the provisions of the Pharmacy Act, even when it contained a statutory poison. It was so held in the case tried in Dublin, and the decision has not been appealed against. But it has been pointed out that if this be a correct interpretation of the law, the object of the Pharmacy Act would in such cases be frustrated by the grant of Letters Patent. In connection with this subject it has recently been suggested in the *British Medical Journal* that the apparent anomaly is really due to an erroneous interpretation of the exempting provision in the Pharmacy Act, and it is argued that the exemption of patent medicines relates only to wholesale trade in those articles, and not to the retail sale of them. That view is consistent with other exemptions provided for by the Pharmacy Act, and also with its general object. But that is a point which will have to be judicially decided by the courts. Action has already been taken for that purpose by the Council of the Pharmaceutical Society, and an application to the Court of Chancery for the revocation of Letters Patent granted for a cough medicine containing morphine has been acceded to. In that instance the patentee did not oppose the application, and consequently no decision of the general question was arrived at, as the order for revocation of the patent was made without consideration of any one of the general grounds of objection stated in the petition :—(1) that the grant of Letters Patent in such a case would be contrary to public policy; (2) that the alleged invention was not subject matter for a patent; (3) that it had been anticipated; and (4) that the specification was insufficient.

Another point which has to be decided is that relating to the quantity of a scheduled poison necessary for bringing a preparation within the scope of the Pharmacy Act. That question has been raised on several occasions as a partial defence in prosecutions for infringement of the Act which have been decided on other issues; but in the case of the Pharmaceutical Society *v.* Delve, though evidence had been given as to the presence of morphine in the preparation sold, the Manchester County Court Judge decided that there was no case unless it could have been shown that there was a substantial quantity of the poison. In that case the Judge referred to the reasoning by which Mr. Justice Collins arrived at the conclusion that a preparation containing as one of its ingredients a scheduled poison comes within the Pharmacy Act, and to his remark that, having once arrived at that interpretation of the Act, the question as to more or less of the poison did not appear to him to have any technical bearing until a point is reached at which the principle *de minimis non curat lex* would apply. His Honour Judge Heywood appears, however, to have assumed that the case before him was of the nature referred to in the latter part of this remark. In the appeal against the decision given, Justices Charles and Wright took the same view and dismissed the appeal, mainly on the ground that they considered the evidence was insufficient to justify a judgment for the Society.

**Local Organisation.** The subject of local secretaries came before the Council at the January meeting in consequence of the vacancy in that office at Manchester caused by the resignation of Mr. Benger. The services rendered by him during several years were unanimously acknowledged by the Council, and in appointing Mr. H. Kemp as his successor, the desirability of assistance in the performance of the duties of the office in such a large district was fully recognised. But it was felt that the initiative to action in that direction should come from the locality where assistance was requisite. The President stated that the Council was most anxious to give local secretaries in large towns all the assistance possible, in response to intelligent local opinion, and that while the Society, as constituted by charter, is in one sense a voluntary body, its first duty is to act in its public capacity on the lines of the Acts of Parliament. For supplementing the benefit thus accruing directly or indirectly to registered chemists and druggists, augmenting the influence of the Society as their representative, and providing a common basis of action, active co-operation is requisite throughout the kingdom. It has always been urged in this Journal that it lies with the Society's local secretaries to initiate action in this direction by discussion of matters at public or private meetings, and communicating the views arrived at to the Council as the central executive body. Considerable benefit in that way has been effected by the divisional secretaries in the metropolitan district, and similar action on the part of local secretaries in the provinces and in Scotland would lead to a more complete understanding of what is desired and what can be done to promote the interests of the trade by a better and more thorough organisation.

In conjunction with this subject, reference was made by the PRESIDENT at the annual meeting to a suggestion put forward by Mr. GEORGE BROWN, of Sandown, as to the appointment of an organising secretary to visit different parts of the country and impress upon members of the trade the desirability of associating themselves with the Society with a view of contributing to the general welfare of the body. This suggestion has not met with much support, and as the PRESIDENT pointed out, it would be scarcely consistent with the character of the Society as a voluntary organisation for such work to be done by a paid official. It is from the members themselves that this is to be expected, and especially from those holding the position of local secretaries. The occasional visits of the PRESIDENT and other members of the Council to different parts of the country, for the purpose of attending meetings for the discussion of pharmaceutical affairs, have already been of so much service in correcting misapprehensions as to the powers of the Society and creating sounder opinions as to the mode in which its influence for the benefit of the trade is to be increased, that some arrangement for holding such meetings periodically appears to be eminently desirable.

In the annual report of the Executive of the North British Branch of the Society, it was stated that a special committee had been appointed to consider the appointment and duties of local secretaries in Scotland, and the report of that committee was referred to a committee of the Council. The chief suggestions and recommendations of the report were unanimously adopted at the July Council meeting as being calculated to awaken more interest in the work of the Society in Scotland. In speaking on the subject, Mr. STORRAR expressed his belief that there was an increased feeling of loyalty to the Society in Scotland, and he thought that a large increase of members might be expected to result from the altered arrangements as to local secretaries.

The re-organisation of the Glasgow and West of Scotland Association has given evidence of an earnest movement towards local activity and organisation. The proceedings at the inaugural meeting furnished grounds for believing that under the presidency of Mr. CURRIE the Association will eventually be of great service in improving the condition of pharmaceutical affairs in the West of Scotland. The personal support rendered on that occasion by members of the Council and officers of the Scottish Executive was mentioned in complimentary terms by the PRESIDENT at the Council meeting in March, as showing a spirit of loyalty and a commendable desire to promote the success of the new organisation.

**ADMINISTRATION OF THE PHARMACY ACT.** The conduct of the work done in this direction has been largely affected by recent judicial interpretations, and the subject has been during the past year continuously under consideration by the Council. At the March meeting the PRESIDENT drew special attention to the great importance of the judgments delivered in the PIPER case, as establishing for the first time beyond question that the provisions of the Act apply to all mixtures of poisons with other ingredients; that it is also the duty of every registered person to know the nature of any preparation he sells, and if it contains poison to see that requisite precautions are observed. The performance of that duty may be in certain respects assisted by the Council, but it is the individual seller who is reponsible under the Act. In regard to very small quantities of poison, there is the same individual responsibility, which can be properly exercised for the purpose of the Act only by duly competent persons. The importance of these general conclusions is considerably enhanced by the fact that the points raised appeared to legal minds somewhat obscure and at first sight susceptible of different views. Hence the report of the trial may be read with profit by everyone on the Register as a useful object lesson in poison law. At the annual meeting the PRESIDENT referred to the result of the case as a satisfactory settlement of a difficult question and the expectation that unregistered persons would accept the decision of the appeal appeared then to be justified by the very strong terms in which the necessity of pharmaceutical qualification of persons handling or selling poisons was expressed by the judges. But since that time it has become apparent that such is not altogether the case. The old arguments in favour of free trade in poison have again been put forward by the advocates of that system, in defence of prosecutions for infringements of the Act undertaken by the Society. It is therefore probable that the legal expenses attending the administration of the Act will be even more considerable than they were shown to have been in the last financial statement. The alteration then made in the entry of law costs was explained by the President as having been adopted upon the principle that no consideration of money should be associated with the work done by the Council in performance of its public duty of administering the Pharmacy Act. The expenditure on that account is not to be regarded as a loss, though it is a matter of considerable cost to the Society, and it shows that there is no ground for the statement sometimes made that the Society seeks to obtain a money profit out of the prosecution of offenders. There is as little foundation for the charge that the Council seeks to secure a monopoly in the interests of chemists and druggists. The Society as a public body cannot incur the risk of either charge being made with justice, and for that reason due circumspection must be exercised. Acting upon that principle, notices of warning were sent out in regard to the unlawful sale of proprietary medicines immediately after judgment was delivered by his Honour Judge Bacon, and in the case of a number of sellers of those articles who then undertook to discontinue the practice, the penalties incurred by them were not exacted.

**Examinations.** The Government Visitor, Dr. Stevenson, in his Report on the Examinations for the year ending March 31, 1893, shows that there was a slight diminution in the number (1410) of candidales at the First Examination, as compared with the preceding year, when 1442 presented themselves. The percentage of failures (52·5) was practically the same, and a decided improvement in arithmetic was counterbalanced by weakness in Latin and English, particularly the latter. The hope is once more expressed "that before long it will be made obligatory to pass this examination before commencing apprenticeship." The proportion of failures in the Minor Examination (65·1 per cent.) was five per cent. greater than in the previous year, weakness in chemistry and dispensing being responsible for non-success in the case of nearly half the candidates. A critical analysis of the figures in the various subjects for the two years seems to indicate that, during the period covered by the latest report, candidates have been better prepared in those branches of knowledge which are best studied in the pharmacy during apprenticeship. Thus, there is a slight improvement in Materia Medica and Prescription-reading, whilst in both Pharmacy and Dispensing the proportion of rejections is considerably lower than it has been for some time past. In Chemistry and Botany, however, the percentages of failures are more than twice what they were, and it is very evident that the study of these primarily essential subjects receives much less attention than their present advanced state requires. For the Major Examination there were only 132 candidates, as against 153 during the preceding twelve months, and the percentage of failures rose from 44·4 to 60·6, 35·6 per cent. of the candidates being rejected in Chemistry and Physics. Dr. Stevenson states that "the practical work now insisted on is felt to be a severe test by those whose knowledge has been acquired chiefly from books and oral teaching, and not in the laboratory." He further expresses the opinion "that the efficiency of the Minor and Major Examinations has been sensibly increased by the new regulations," and notes with satisfaction "that chemists and druggists are now examined on the law relating to the sale of poisons so far as they are affected by it."

The report, as a whole, may be regarded as supporting the opinions of those who urge that important educational reforms are essential ere pharmacy can attain its proper position, and those who practise it receive due recognition of their professional claims. A great advance would doubtless be made were Dr. Stevenson's suggestion — that the passing of the scholastic examination before apprenticeship should be obligatory—carried out, but a yet more satisfactory sifting process might be effected by pharmacists themselves if it were generally regarded as a distinct breach of pharmaceutical ethics for anyone to accept as a pupil a youth who, though examined, is not as an individual likely to command a certain measure of respect in his future career. That is to say, the manners as well as the knowledge of the would-be pharmacist should not fall short of a definite standard. As to subsequent training, there can be no doubt that, in this country, a willing pupil, working under a conscientious principal, can yet secure a proper grasp of the technicalities of his business, though this would appear to be opposed to American experience, if we may judge from recently published expressions of opinion. Before the qualifying examination is passed, it seems probable that, in the not far-distant future, candidates will be expected to produce evidence of satisfactory training in the more purely scientific subjects upon which their art is based, in addition to the practical applications of these in everyday work. Finally, the fact must be emphasised that the pharmacist who would keep in the front rank of his profession cannot afford to rest content with the bare legal qualification, but must neglect no opportunity of keeping himself in advance of those with whom he comes in contact, and especially in his own particular department of activity and all knowledge relating thereto.

The statistics for the whole of the year 1893 show that a larger number of candidates entered for and passed each examination than during 1892, when 638 out of 1363 passed the First Examination, 358 out of 871 were successful in the Minor, and 43 out of 140 in the Major. During the past year, 1489 entered for the First Examination and 739 passed, the percentage of rejections, 50·3, being slightly lower than previously. Certificates from other approved examining bodies were accepted in 79 cases, the number of undergraduates in pharmacy being thus increased by 818. For the Minor Examination, 1189 candidates presented themselves, 469 passed, and 3 passed the Modified Examination, 472 names being thus added to the Register of Chemists and Druggists. Of 152 who entered for the Major Examination, 69 passed. It will thus be seen that the percentage of failures in the Minor was somewhat higher in 1893 than in 1892, whilst that of the Major remained practically unaltered. There is still a marked discrepancy in the results at Edinburgh and London respectively, the failures at the former centre being nearly 15 per cent. less in the Minor and 14 per cent. less in the Major. This can scarcely be attributed to differences in preliminary education, since the results at the First Examination are practically identical in England and Scotland. Unless, therefore, the effects of subsequent training and systematic instruction are markedly different in the north and south, the discrepancy may probably be due to difference of method on the part of one or other of the Boards of Examiners. Mr. J. LAIDLAW EWING, Chairman of the Executive of the North British Branch, speaking at the last annual meeting, stated that Scotch students make sure they are able to pass the Minor Examination before they enter for it, but since considerably more than half those who pass at Edinburgh are not Scotch, this fact has only a limited application as explaining the results. Whatever may be the actual explanation, however, it should be regarded as eminently undesirable, as the chemist and druggist is at present situated, that any opportunity should be afforded for imperfectly qualified individuals to become registered under the Pharmacy Acts, and it is to be hoped that as the examiners acquire greater familiarity with the regulations of the new syllabus, increased uniformity may be apparent at the two examination centres.

BENEVOLENT FUND. The useful assistance rendered from this source during the past year has been undiminished, and in several instances productive of especially beneficial results. But the general support of the Fund by members of the trade is still far from being adequate to the requirements of the case. At the October meeting of the Council some disappointment was expressed that the subscriptions had not increased, and that the resources of the Fund were then short of what was likely to be required. At the meeting in December the balance in hand was barely enough to pay the annuities falling due in January, 1894. Among the donations to the Fund were a legacy of two hundred and fifty pounds left by the late Mr. BARKER, a hundred pounds given by Mr. BURROUGHS, and fifty pounds received from Mr. HORACE DAVENPORT on behalf of the Directors of the Chemists' Mineral Water Association. Through the aid of the Orphan Fund founded in the previous year, an admission to the London Orphan Asylum at Watford was secured in a case where assistance of that nature was much needed. Up to the present the contributions to this Fund have been but slender.

PHARMACEUTICAL MEETINGS. The evening meetings of the Society in London have this year been especially well provided with subjects of interest, and generally well attended. The lectures by Mr. P. W. SQUIRE, Professors DUNSTAN, GREEN, and GREENISH, Mr. WARD's paper on "Manna" and Mr. MARTIN's upon "Pharmaceutical Meetings, Legislation, and the Educational System of the United States" were each in their way highly instructive and useful. The evening meetings in Edinburgh have also been well supported by the contribution of papers giving rise to the discussion of matters of pharmaceutical practice. At the meeting in November there was a lecture by Professor CASH, in which he gave a most interesting summary of the principles on which the application of new chemical remedies to the treatment of disease is to be carried out conjointly by pharmacologists, therapeutists, and pharmacists. Among local associations in the provinces those of Birmingham, Liverpool, Manchester, and Sheffield have been conspicuously active in discussing projects of trade organisation for creating greater interest in pharmaceutical affairs, and promoting co-operation with that object. These projects are not yet sufficiently developed to justify criticism, but it may be stated that they bear evidence of being instigated by sound sentiments and by a commendable desire to promote the welfare of the craft. The Nottingham and Notts Association has been occupied with the work of providing for a meeting of the British Pharmaceutical Conference and entertaining the visitors. That was done in a manner which well sustained the reputation of the town for hospitality and ability to carry out well planned arrangements. An association has been formed at Plymouth to represent the three towns and district. The association established last year in Cambridge has now shown signs of successful progress. In various other parts of the country local organisations have brought chemists together periodically, either to hear papers read, to discuss matters of trade interest, or for the purpose of social entertainment. In addition to the subjects of technical interest dealt with on those occasions, several matters of a political nature have been discussed, and this circumstance may be regarded as a promising indication in regard to the future evolution of sound representative opinions.

In Scotland, activity in this direction has been especially manifested in Glasgow and the surrounding district. But in other localities it has been chiefly among assistants and apprentices that the practice of holding periodical meetings has been kept up. The Edinburgh Chemists' Assistants' Association has continued its meetings with success; but the Dundee Association has been less fortunate. The Edinburgh District Trade Association has discussed the subject of the Medicine Stamp Act, but without as yet arriving at any unanimous conclusion.

Among the junior associations, the School of Pharmacy Students' Association, and the Chemists' Assistants' Associations in London, Liverpool, and Brighton have maintained their position as useful organisations, the beneficial influence of which may be expected to manifest itself in the future even more decidedly than at the present time.

SCIENTIFIC PROGRESS. The periodical reports of new achievements in the prosecution of research have sufficiently anticipated the necessity for any detailed recapitulation of the facts recorded in the "Month." Reference may, however, be made to the observations as to the influence exercised upon chemical action by extreme reduction of temperature. The facts already ascertained are of especial interest, and together with those already observed by Hall under opposite conditions, they point to the conclusion that chemical action is not an inherent property of substances, but merely a function dependent upon physical conditions.

CONFERENCE. At the Nottingham meeting of the British Pharmaceutical Conference, Mr. Corder's presidential address was devoted in great measure to remarks on some herbaceous plants of general interest. A preliminary report on coto bark, communicated by Elborne, left the subject practically where it was, the investigation being scholastic rather than botanical in its tendency, and the results inconclusive except in so far as they revealed the amount of confusion prevailing at different times with regard to the bark. Clowes' description of the progress of pharmaceutical education at Nottingham during a period of twelve years, and the present systematic arrangements there for securing a complete and thorough training in the subjects included in a pharmaceutical curriculum, served to show what can be done in this direction, in provincial centres, by concerted effort on the part of local pharmacists and students. Belladonna served as a text for Wright, who suggested the idea of reverting to the leaves as a source of extract for use in preparing collodium belladonnæ, and Naylor, who detailed certain observations made during the manufacture of liquid belladonna plaster. Farr and Wright gave the results of work on the standardisation of alkaloidal tinctures; Conroy expressed the opinion that the minimum specific gravity of sandal wood oil should not be less than 0·972 at 60° F.; Parry and Estcourt contributed some startling figures regarding commercial beeswax; Wright stated that excessive acidity was probably the disturbing element in Easton's syrup; and Ough submitted the results of analyses of effervescent caffeine preparations. An extremely practical and useful paper on the pharmacy of the thyroid was contributed by White; Davis described experiments on the digestive action of papain; Holmes wrote concerning commercial ipecacuanhas; and Bird showed how emetine could be extracted from the last-named drug without the loss of other constituents. In other papers communicated to the meeting, the determination of diastasic action on starch was considered by Dott, who also showed reason for regarding the formula of lithium nitrate as $LiNO_3 \cdot 3H_2O$; the purity of lithium carbonate was dealt with by Bowden; and African copaiba by Umney. A new form of apparatus for the gravimetric determination of carbonic anhydride gas was also described by Hoseason, and an improved arrangement for washing readily oxidisable precipitates by Forret.

PHARMACY. In the annual report presented to the Pharmacopœia Committee of the General Medical Council last year, Professor Attfield drew special attention to two subjects of prominent interest—the official tinctures and the extension of the Pharmacopœia so as to cover the needs of the Colonies and India. As regards the former, the opinion was expressed that much further work will require to be done before the reconstruction of formulæ of tinctures and other galenical preparations can be undertaken to a degree commensurate with the advances that have been made on the chemical side of pharmacology. The idea of making the Pharmacopœia imperial in its scope has again been brought forward quite recently, the Medical Council having considered the matter favourably and decided to seek the aid of the medical and pharmaceutical authorities in India and the Colonies, in addition to the several home medical authorities and the Pharmaceutical Society. Various suggestions submitted in the report were mainly the outcome of observations and experimental work by pharmacists. Thus, Coull's suggested test for the presence of silica is mentioned as a desirable addition to the official description of phosphoric acid; Abraham's reasons for raising the specific gravity of pure ether to 0·722 are approved; Hodgkin's suggested test for animal charcoal is recommended for adoption; the tests for chloroform, proposed by Brown, Dott, and Ramsay, are mentioned, as well as the work of Schacht and Biltz on the subject; and, similarly, reference is made to the observations of Moss on extract of cascara sagrada, de Vrij on pomegranate root bark, Mackenzie on liniment of iodine, Lunan on soda-water, Duncan and Macpherson on strychnine solutions, Cripps, Schimmel, and Holmes on oil of sandal-wood, Holmes and Warden on Indian opium, and Farr and Wright on tinctures.

The preservation of spirit of nitrous ether has received further attention, Meldrum recommending the addition of 10 per cent. by volume of glycerin, as materially preventing loss of ethyl nitrite and reducing total acidity, without causing any physical alteration in the preparation. Thomson supports this opinion, but suggests that while a 10 per cent. addition is best for solutions in rectified spirit, half that proportion will suffice for those in absolute alcohol. Umney is of opinion that, since this spirit is now largely made by simply dissolving ethyl nitrite in spirit of wine, the official tests should be extended so that distilled preparations may be distinguished. The crystallisation that takes place in Easton's syrup when the temperature is reduced is attributed by Lyon to the presence in it of large excess of acid; Martindale, however, suggests that there may be insufficient water to hold the quinine in solution if the syrup contains the full quantity of sugar. Field states that in the preparation of pyroxylin, the physical form of the fibre has considerable influence on the process of nitration, and states that chlorine must be absent or an acid pyroxylin will be produced, which cannot be neutralised. The absence of moisture is also essential to the production of a carefully prepared pyroxylin, and Weber shows that, in making this compound, it is dangerous to attempt to remove the final traces of acid by washing with dilute ammonia water, an explosive compound being thus formed. Rutherford Hill finds that strychnine in solution in a mixture may be liberated by the action of the excess of ammonia in sal volatile and carried down by globules of chloroform, when a large proportion of the latter is present, the final dose of the mixture being thus rendered highly poisonous.

Acetic acid is again recommended as a menstruum for drugs by Remington, excellent results having thus been obtained by Squibb. Cowie advocates an amendment of the official description of liquid extract of ergot, whilst Thomson finds that there is a loss of 44 per cent. of total alkaloids in the official decoction of cinchona, and 20·3 per cent. in the acid infusion. Carles considers that kaolin and anhydrous sodium sulphate make a better pill excipient in all cases where kaolin ointment is generally used; Violé proposes to use animal charcoal for a similar purpose with creasote, essential oils, etc.; Owen deals with the diastasic value of malt extracts; Wood suggests a modification of the official formula for pil. ipecac. cum scilla; and McFerran gives a detailed explanation of the methods by which compressed tablets may be prepared. A useful mechanical stirrer is described and illustrated by Moss; Decker publishes a practical thesis on glycerin suppositories; and Gautier describes a new form of mould for making suppositories without heat. The preparation of humanised milk from cow's milk is considered by Soxhlet and others, the former proposing to mix the cow's milk with half its volume of a solution containing 12·3 per cent. of milk sugar. Decalcification of milk is said by Wright to delay rennet coagulation, and he precipitates the lime salts by means of sodium citrate. Salol is suggested as a pill-coating in place of keratin, by Oeder; steresol as an antiseptic varnish, by Berlioz; oleo-creasote as a substitute for creasote, by Prevost; and the use of glucose in syrups, as tending to preservation, by Klie. Cristalline is the name given to a new form of collodion in which methyl alcohol replaces the ether and alcohol of the ordinary form; the manufacture of pepsin is exhaustively and practically described in an article dealing with the more prominent processes; the preparation of a dry preparation of the thyroid gland is explained by White; and Cripps criticises several of the pharmacopœial extracts, suggesting the removal of those of jalap and hemlock from the Pharmacopœia.

The applications of the antiseptic method in medicine have been shown in several instances to have a direct interest for pharmacists, and the value of a knowledge of bacteriological processes has been well exemplified. Thus, Marinucci shows that hypodermic solutions frequently need sterilising, since living germs of a harmful nature are often present. A suggestion has been made to prepare an antiseptic paper for surgical use by impregnating unsized paper with mercuric chloride. The addition of glycerin to vaccin lymph has been found advantageous by Chambon, Ménard, and others, being said to act as a preservative and even to improve the lymph on keeping. Lister has further modified his instructions for preparing antiseptic gauze, and now directs that the pure cyanide of mercury and zinc should be tinted with mauveine hydrochlorate, whilst the powder should be diffused in carbolic solution, through which the absorbent gauze is then drawn.

Hoseason has found considerable variation in medicated wool impregnated with carbolic or boric acid, or corrosive sublimate. He attributes this to difficulty of storage, and recommends that the wools should be kept in air-tight vessels, whilst uniformity of colour in wools medicated with the same substance is suggested as desirable. Hochenegg also suggests certain precautions against accident in dealing with surgical dressings. The shrinkage of sponges that occurs on sterilising them by boiling is thought by Lister to be unobjectionable, but Kyle, finding it difficult to effect re-sterilisation of sponges completely, considers it wiser to discard them in favour of fresh gauze, which is destroyed after being once used. Vignon shows that cotton exercises a peculiar absorbent action on dilute sublimate solutions, apparently dissociating the salt and combining with the mercuric oxide formed, some mercurous chloride being also produced during the process; and d'Arsonval gives an illustrated description of his sterilising filter for the preparation of thyroid and other organic extracts.

New pharmacopœias have been published for Denmark and the United States, and a useful work on "Galenic Pharmacy," by Cripps. In a pertinent article on the value of drugs, Dr. Wilkes, of Guy's Hospital, deals with their rational use in medicine; "Pharmacy in Persia" is the title of an interesting article by Bonati; the proper relations that should exist between medical men and pharmacists are well described by Merveille; public prejudices against pharmacists are ably combatted by another French writer; and Scoville deals with the general relations of the pharmacist to society.

**Pharmacognosy.** The main feature of the year, with regard to the knowledge of drugs, has been the more general acceptance of the position that a vastly more intimate acquaintance with the histology of drugs is requisite if pharmacists are to fulfil their proper functions to the utmost degree. It is now recognised that the value of a botanical training to the pharmacist, no less than the chemical, is in direct proportion as he applies the knowledge acquired in practice. And the fact should not be overlooked that much of the practical botanical work can be satisfactorily performed on the crude drugs themselves. Further, the value of a proper grounding in the histology of drugs, as an aid in detecting adulterations or substitutions, cannot be over-estimated, and sufficient proof of this statement has quite recently been furnished in Greenish's admirable paper on spurious drugs, in which he dealt with a new matico, a fern rhizome imported as sarsaparilla, substitutes for ipecacuanha and jalap, and a new kind of jaborandi leaves accidentally confused with senna—since referred to by Dyer and Wardleworth, and named by Stapf, *Pilocarpus microphyllus*. By the institution of courses of lectures and laboratory instruction in histology, students are now enabled to acquire more definite notions regarding the structure of drugs than has been customary, and it is hoped that further facilities in this direction may be afforded by the series of articles on "Practical Pharmacognosy," now commencing in these pages.

The information published during the past year concerning new or imperfectly known drugs has not been very extensive. Hooper describes the earth-sugar root of the Tamils, belonging to the Capparideæ, which is not unlike liquorice in appearance, but is less sweet, and appears to contain no substance resembling glycyrrhizin. An astringent gum from Mashonaland, resembling kino in many respects, was shown by Holmes to be the product of *Brachystegia spicæformis*, Benth (Cæsalpinieæ). Champacol, described by Merck as occurring in long, white, felted needles, is obtained from champaca wood; a manna, practically identical with the ordinary variety, is stated by Maiden to be obtained from *Myoporum platycarpum*; *Piper ribesioides* is the source of spurious cubebs examined by Brooke; "Marv" is a Persian drug identified by Stapf as the nutlets of *Salvia spinosa*, L.; and a false kamala, examined by Greenish, proved to consist of a mixture of pollen grains, coarsely powdered safflower florets, starch grains, and the lignified tissues from the pericarp of some small fruit. Numerous acari and small beetles were also present, and the specimen is briefly described as consisting of carelessly collected and badly preserved safflower, mixed with much extraneous matter, and reduced to coarse powder.

Oberhauser has obtained a volatile oil, resembling that of origanum in odour, from the flowers and leaves of *Solidago rugosa* Holmes and de Wevre have proved the supposed fruits of *Daphnidium Cubeba* to be really derived from *Litsea citrata*, Bl.; and the former also classifies the numerous strophanthus seeds of commerce. Arrow poisons of various kinds have occupied a considerable share of attention, and several African and Malayan varieties have been examined from the botanical, chemical, and physiological points of view, by Fraser, Tillie, Stockman, and Holmes, whilst Lewin has examined various species of *Acokanthera*, and concludes that the poisonous ones are characterised by a bitter taste, the presence of a glucoside, and the appearance of a green fluorescence under certain conditions. Heckel and Schlagdenhauffen find that a variety of gamboge, from *Garcinia collina*, probably possesses similar properties to that of *G. morella*, with which it is strictly comparable. Pernambuco jaborandi is attributed by Holmes to a new species, *Pilocarpus Jaborandi*; Bayón deals with caparrapi balsam; Arnaudon and Waldini with the oil of *Jatropha Curcas*; and Flückiger with dragon's blood. Mexican valerian is described by McLaughlin; cocillana, the bark of a species of *Guarea*, by Rusby; Jorissen and Hairs have found vanillin in cloves; and Meyer has studied the living cochineal insect. Manna collection in Sicily is shown by Ward to be conducted at the present day practically as described in 'Pharmacographia;' Prebble, of Bombay, writes about *Illicium religiosum*, *Pistacia Terebinthus*, *Uncaria Gambier*, East Indian Gums, and other Indian products; Sutherland has described the characters and uses of some bazaar drugs from Burmah; and Robinson gives the results of the examination of several samples of jalap and jalapin.

Botany. In the department of physiological botany further attention has been devoted to the absorption of atmospheric nitrogen by plants, but the problem is yet far from being solved in its entirety. The sum of the researches carried out up to the present appears to be that, though in the case of leguminous plants the fixation is due to the action of bacterium-like bodies contained in tubercles formed on the roots, some as yet unknown cause must be found to explain the presence in certain other plants of nitrogen in excess of that obtainable from the soil. A good deal of sound experimental work on this point has been done at Rothamsted by Sir John B. Lawes and Dr. (now Sir J. H.) Gilbert, who have recently celebrated the completion of the half century of their joint labours, which have materially advanced chemistry, botany, and physiology as sciences. The gases in living plants have been considered by Arthur, who shows that the two main causes of disturbance in the relation of oxygen and carbon dioxide in the plant are the processes of assimilation and respiration. The effects of fog on the different parts of plants are described by Oliver, filtration of the surrounding air being indicated as the most effectual preventive of mischief, and the preservation of trees, etc., in towns shown to be chiefly a matter of expense. In a very suggestive paper, Brown and Morris deal with the chemistry and physiology of foliage leaves; the occurrence, relations, and physiological significance of the starch, diastase, and sugars contained in the leaves being considered at length. Cane sugar appears to be the first sugar synthesised by the assimilatory process, and it is translocated as dextrose and lævulose. Starch is formed later at the expense of the cane sugar, and is translocated as maltose. Phipson has grown plants in atmospheres of different gases, and formulates a theory to the effect that the presence of oxygen in the atmosphere is to be attributed to plant activity. Assuming that the primitive vegetation thrived in an atmosphere of carbon dioxide, he suggests that the carbon was gradually assimilated and the oxygen liberated until the present day conditions were attained. What Nägeli describes as the oligodynamic phenomena of living cells are the result of the poisoning of plants by infinitesimally small quantities of copper, lead, tin, and mercury. Other metals do not seem to cause similar effects.

An important point has been satisfactorily demonstrated by Peirce with regard to the structure and functions of parasitic plants. Thus, in the haustoria of complete parasites he detected sieve tubes, and these with the other tissue elements present formed a direct connection between similar elements in the host plant and the parasite, thus enabling carbohydrates to pass to the latter. In partial parasites like the mistletoe, however, sieve tubes are lacking in the haustoria, no such direct communication is possible, and nothing but water or salts in aqueous solution can be conveyed from the host plant. The study of vegetable ferments has resulted in the discovery of a number of new ones, together with a fuller knowledge of those previously described. A soluble ferment in *Aspergillus oryzæ* has been found by Effront to have its saccharifying power augmented by salts of aluminium and of phosphoric acid, asparagin, and certain albumins. The same investigator increases the fermenting power of yeasts by means of fluorides. *Aspergillus niger* contains a mixture of ferments, one of which—named inulase by Bourquelot—is capable of saccharifying inulin, whilst if beer yeast be also added the lævulose formed may be further converted into alcohol. The same plant contains maltase and trehalase, which convert maltose and trehalose respectively. In *Penicillium glaucum*, Gérard has distinguished a ferment like emulsin; and Chittenden describes the ripe pineapple as containing a powerful proteid-digesting principle, acting indifferently in acid, alkaline, and neutral fluids. Wehmer claims to be able to form citric acid from glucose, to the extent of fifty per cent. of the latter employed, by inducing fermentation by means of certain filamentous fungi, which he terms Citromycetes. Glucase—an enzyme capable of converting one hundred times its weight of maltase, and supposed by Morris to be peculiar to maize—is thought by Lintner and Jalowetz to exist in various cereals. A bacterial organism isolated from the pear by Tate produces marked lævolactic fermentation, and Guignard has proved the reactions of a ferment in capers to be identical with those of myrosin. Treating of the determination of diastase in plants, St. Jentys points out probable causes of error in Wortmann's experiments, which led the latter to suppose that a diastasic ferment was not essential to the formation of sugar from starch. The whole subject of vegetable ferments has been very ably and fully discussed by Green, who classifies them into those that attack carbohydrates, those that decompose glucosides, the proteo-hydrolytic group, and the enzyme that decomposes oils or fats. Other varieties occur which it is somewhat difficult to classify, having a more special action confined to particular substances, and, finally, there are the various enzymes extracted from bacteria.

Turning attention now to work on other principles contained in plants, Ewell and Wiley state that the fresh root of sweet cassava, *Jatropha manihot*, contains a notable proportion of hydrocyanic acid (·015 per cent). The root cannot be safely employed as food, therefore, until it has been boiled to expel the poison. From its starchy contents may then be prepared a tapioca, glucose, alcohol, and cane sugar. From the tubers of *Stachys tuberifera*, Planta and Schulze have obtained a crystallisable carbo-hydrate—stachyose, together with stachydrine and another organic base, whilst the presence of glutamin and tyrosin was detected. Tanret gives the formula for practically pure and dried inulin as $(C_{12}H_{10}O_{10})_6.H_2O_2$. It forms small, irregular granules, does not affect polarised light, and is only slightly soluble in water, unless boiling. It is not coloured by iodine, or affected by beer yeast or diastase, and does not reduce Fehling's solution, agreeing in these respects with pseudo-inulin and inulenin, two recently discovered inulin-like bodies. The nuclein of barley is said by Petit to differ from animal nucleins in not containing sulphur. It forms a peculiarly favourable culture medium for micro-organisms. The distribution of mannite and dulcite in plants is dealt with by Monteverde; various writers discuss the structure of yeast; Kobechek has found an alkaloid and a glucoside in *Narcissus orientalis*; and Barthelat has examined the tannin-secreting tissues of the Zingiberaceæ. A study of the germination of the castor-oil seed has led du Sablon to the conclusion that sugar is probably produced by the direct transformation of the oil normally present; Groom finds the aleurone layer in grasses to be notably a receptacle for phosphates; an irritant poison is stated by McAlpine to be present in the leaves of *Homeria collina*; Tiemann and Krüger attribute the perfume of orris to a ketone named irone, which is an isomer of the ionene obtained from citral; and Briant and Meacham show that hops contain three resins, one of which is distinctly antiseptic, especially as to lactic fermentation, though not in acetic. Several tannins are also present, together with asparagine, fermentable sugars, and diastase.

In the department of systematic botany further suggestions have been made with the view of reforming existing systems of nomenclature and classification, but little of definite value has been accomplished in that direction. One of the most notable contributions to the discussion is that of Bessey, who urges that the system of Jussieu and de Candolle is now as much a clog and a hindrance to botanists as that of Linné was sixty years ago. He further contends with much reason that a scientific system should be based on the truths established by the study of the doctrine of evolution. Druce quotes the circular letter on nomenclature sent out by the Berlin committee, which he criticises, whilst making certain suggestions with regard to it, and Holmes suggests certain emendations in botanical terminology. Heckel and Schlagdenhauffen have identified a plant, producing peculiarly coloured seeds which contain coumarin, as *Copaifera Salikounda*; Scott Elliot has published information concerning some economic plants of Sierra Leone; Fliche, after examining some fossilised vegetable remains, has placed them in a new genus—*Pseudo-Araucaria*, connecting the *Araucaria* with *Abies*; Hooper describes *Trapa bispinosa*, the Indian water chestnut, which affords food for the natives during four months of the year, and is a source of considerable revenue to the Indian Government; and von Mueller contributes a note on botanical collections, describing those made by Macgregor in British New Guinea. The concluding papers of the series, entitled "Early Botany and Materia Medica in England," dealing with the rise of vegetable physiology, phytology, physic gardens, and botany at the universities, have also been published, bringing the history of the subject up to the close of the eighteenth century, when the Linnean system was fully accepted at the great centres of learning in England.

**Bacteriology.** This subject has now attained a fairly definite position and become extended in scope by the inclusion of investigations on low forms of life generally. The study of bacteria proper, using the term in its general sense, has not yielded results of importance corresponding to what was anticipated, and it seems practically certain that the biological method of examination—though of very great value and absolutely essential—must be supplemented by chemical investigations before any further great advances can be made. The mass of matter published regarding bacteriology requires careful winnowing to distinguish the wheat from the chaff, and it is to be feared that the latter preponderates greatly. In the fermentation industries, however, the application of bacteriological methods has proved distinctly successful, as indicated in Frankland's lectures on the subject. These lectures serve as a comprehensive summary of the work that has been accomplished in several directions, treating as they do of microscopic examination; staining of bacteria; cultivation of micro-organisms; culture media; yeasts; various fermentative processes; and the absorption of atmospheric nitrogen by plants. The methods adopted, which are more or less common in every branch of such work, are, by means of illustrations and concise descriptions, rendered readily comprehensible. The necessity of an extension of our knowledge regarding the chemical processes involved is emphasised even in these lectures, and, in the author's evidence before the Royal Commission on London Water Supply, it was shown that physical factors must also be taken into account ere certain problems can be properly solved. Sunlight and temperature have been shown to exercise a powerful influence upon the organisms contained in river water, whilst the microbes themselves can be made to assist in the process of water purification by filtration, the formation of a gelatinous film of this living material being found essential to the perfect action of sand filters. **Marshall Ward** has shown that the spores of anthrax bacilli are destroyed by exposure to direct sunlight, and that this agent is probably the most potent factor in the purification of air and rivers.

Important economic results have been suggested by the researches of **Nathan**, **Rosutany**, and **Suchsland**, who have sought to show that the fermentative changes in wine, cheese, tobacco, etc., might possibly be modified artificially, the distinctive bouquets, tastes, and aromas of particular varieties being thus imparted to others, naturally inferior. **Tischutkin** has suggested that the solution of albumin by the sap of insectivorous plants is probably due to the activity of micro-organisms rather than to the presence of peptonising substances in solution. **Schluter** has shown the incorrectness of the generally accepted idea that bacteria cannot develop in the presence of acids. **D'Arsonval** finds that, whilst micro-organisms are less resistant of heat than soluble ferments, they withstand low temperatures better. Thus, beer yeast does not lose its special properties at 100° C., though invertin is destroyed as a ferment with that degree of cold. In a similar way, it was found by **Dastre** that gastric juice fails to resume its physiological activity after cooling to the same extent. The lab-ferment of milk, isolated by **Cohn**, appears to be identical with that first isolated from rennet by **Blumenthal**. The former separated the ferment from a proteolytic enzyme allied to trypsin, found in milk inoculated with certain bacteria.

Leucocytes have been shown by **Wright** and **Bruce** to contain both "oxyphile" and "basophile" elements, attracting acid and basic dyes respectively. The nucleus is invariably basophile, thus resembling cell nuclei generally, whilst any granules present are oxyphile. The sterilising action of light on urine has been proved by **Richardson** to be the result of the action of peroxide of hydrogen, which is produced when the urine is exposed to light and destroys any micro-organisms present. The decomposition of the same compound and consequent evolution of oxygen is utilised by **Gottstein** as a qualitative test for the presence of bacteria. Another possible check on these ubiquitous organisms is suggested by **Attfield**'s experiments with the infusoria of river water, the presence of which seems in some way associated with a diminution in the number of bacteria. **Koch**'s experiments on river water at Hamburg and Altona reveal the marvellous efficacy of thorough filtration as a check on the spread of cholera. He has also published an improved method for detecting cholera bacilli. **Gallipe** indicates how the development of calculi may be due to bacteria; **Boyer** and **Lambert** trace one disease of the mulberry to *Bacterium mori* and another to a fungus; **Thaxter** describes a new group of schizomycetes—myxobacteriaceæ—found in gelatinous growths on decaying wood, etc.; **Pick** finds that wine added to drinking water diminishes the risk of infection during epidemics, by checking the growth of disease germs; **Nourry** and **Michel** check the curdling of milk by saturating it with carbonic acid, which prevents the development of germs; and it is noteworthy that, whilst the specific action of pathogenic bacteria is now attributed to toxalbumins rather than to ptomaines, **Buchner** considers that both toxins and antitoxins are probably bacterial products, the latter acting by establishing immunity to specific diseases in animals and apparently remaining stored up in the organism after the toxins are rendered harmless.

The number of substances said to possess antiseptic and disinfecting properties has been largely added to during the year, but it is doubtful whether many of the additions are likely to prove of permanent value. It may be remarked, by the way, that much confusion exists regarding the meanings of the words antiseptic, germicide, and disinfectant. Antiseptics are purely preventive in their action, hindering the growth and increase of micro-organisms, which, however, may again develop freely when by dilution or other means the restraining effect of the substances used is relaxed. Germicides, on the other hand, destroy such forms as they come in contact with, whilst disinfectants, in addition, decompose the products of the activity of low forms of life, and thus render them harmless. It is doubtful if any substance should rightly be regarded as a disinfectant except it be capable of setting up a process of oxidation. This idea is borne out by the observations of Chamberland and Fernbach, who recommend diluted chlorinated lime solution as probably the best disinfectant for ordinary use. They find concentrated preparations less active in proportion than dilute ones, and suggest that spraying the disinfectant, at a temperature not less than 40°–50° C., is the most effectual method of application. Heider also finds that the action of disinfectants is greatly increased at high temperatures. Stewart compares the value of various agents used as dental disinfectants, whilst carbolic acid is now found by Lister to be the most effective antiseptic for use in surgical operations, and he insists upon the avoidance of all unnecessarily complicated procedure. The use of sterilised water, however, seems likely to supplant chemical antiseptics in surgery, as the healthy tissues are thus kept in the best possible condition to exercise their recuperative power. Bandages, dressings, etc., are also being sterilised by the aid of steam under pressure, and the use of antiseptic agents thus avoided.

Numerous special methods have been introduced for detecting tubercle bacilli in tissues, milk, butter, etc. Sawtschenko states that cholera microbes may pass through the alimentary canal of flies and yet retain their virulence unimpaired; Griffiths has added eczemine—found in the urine in cases of eczema—to his lengthening list of ptomaines; Symons gives an illustrated description of a novel bacteriological culture apparatus; Boyce also simplifies the method of plate culture; Lamal traces the oxidation of morphine, under certain conditions, to bacteria and moulds; Beneke makes a useful suggestion in connection with the inoculation of culture tubes; and numerous other practical suggestions have been duly chronicled. A lecture by Klein, on "Bacteria, their Nature and Function," brings the subject treated of well up to date, as also do Ernst's exhaustive papers on "Phagocytosis." A series of original papers, under the heading "Bacteriology for Pharmacists," was commenced early in the year, and found considerable favour amongst those for whom they were intended, but the publication of so many rapidly succeeding text-books on the subject, anticipating in great measure the projected papers, rendered subsequent elementary lessons superfluous. Two particularly useful volumes published, amongst others, were Migula's 'Introduction to Practical Bacteriology,' translated by Campbell, and Schenk's 'Manual of Bacteriology,' translated by Dawson, the latter being perhaps the best arranged small work on the subject yet published.

Microscopy. Apart from its special applications in the histology of drugs and bacteriological work, the value of the microscope as an instrument of research has been abundantly shown during the year in various ways. Thus, Mesnard has utilised it in an investigation into the mode of the production of perfume in flowers, and, by the aid of ingeniously contrived apparatus and the use of hydrochloric acid as a reagent, has been enabled to localise the essential oils in the blossoms of jasmine, rose, violet, tuberose, orange, and orchids. A similar method had previously been found successful in the localisation of fixed oils. S. le M. Moore, a persistent worker in vegetable histology, was able to show by various reactions that callus must be distinguished from a kindred substance—paracallus, the latter being a true proteid substance, soluble in both peptic and pancreatic fluids. The proteid reactions in cell-walls, he also points out, depend upon the presence of glucosides, whilst an iron-greening tannin exists in lignified cell-walls. The tannin receptacles of the Leguminosæ have been exhaustively examined by Baccarini, who describes their structure and the manner of their distribution. Mangin gives particulars of the methods adopted by him for the identification of pectic substances, and also shows that ruthenium red—a colouring matter as powerful as the more intense dyes of organic origin—is the best reagent for many of these compounds, whilst the only one known at present for most gums and mucilages. A new process of double staining, originated by Rhumbler, is said to distinguish between vegetable substances that were dead or living respectively at the time of preservation. The nature and occurrence of starch in plants has been studied by Bastin, who, after referring to the importance to pharmacists of a thorough knowledge of the different varieties of starch, deals with the composition and formation of this compound, the structure of the grains, and the tissues containing starch. He then describes in detail the different starches found in root drugs and in subterranean stem drugs. Since the varying sizes of specific starch grains constitute a factor which affords much assistance in determining their origin, a brief note has been devoted to the subject of the measurement of starch. The formula is also given, by Geoffroy, for a mounting medium for starch grains, chloral hydrate and gelatin being the chief ingredients.

A very useful illustrated paper by Flatters, on the preparation of vegetable tissue for microscopical examination, furnishes much valuable information regarding the various methods of cutting and staining sections. The latter subject has also been treated in a practical manner by Squire, who distinguishes and gives details concerning nuclear stains and contrast stains, besides devoting consideration to double staining processes, and cellulose reactions, the whole paper serving as an aid towards placing the subject upon a satisfactory basis.

Information as to the best methods of clearing and mounting sections after staining, serves as a useful supplement to the preceding matter. Numerous minor processes in microscopical technique have also received attention, **Meyer** recommending chloral-carmine for staining the nuclei of pollen grains; **Hermann**, a general formula for aniline stains; **Benecke**, a modification of **Weigert's** process for staining connective tissue; **Minchin**, an ingenious method for bleaching sections; **Tempère**, a plan for fixing minute objects in position on slides when mounting; **Gage**, an improved solution of hæmatoxylin, which does not deposit on keeping; and **Mayer**, a new carmine stain—carmalum—useful for objects stained with osmic acid. As regards apparatus, **Piffard** describes a substitute for the camera lucida for use with low powers, and **Sharp** a simple microtome which is inexpensive yet reliable. A paper designed to show the utility of microscopical examinations in detecting drug adulterations has been read by **Austen**; some useful notes on the microscopical examination of urine and sputum are contributed by **Millard**; and several works of practical value have been published, the chief being **Van Heurck's** "The Microscope," translated by **Baxter**; **Cross** and **Cole's** "Modern Microscopy;" and "The Principal Starches used as Food," by **Griffiths**.

**Death Roll of the Year.** The names of several old members of the Society have to be recorded here; **Samuel Gale**, for many years a member of the London Board of Examiners; **Joseph Sidney Lescher** and **George Stanbury Pedler**, both Founders of the Society; **Thomas Smith**, of Edinburgh; **George Baggett Francis**; **John Carr**, a former member of Council; **J. L. Childs**, of Portsmouth, **J. Barlow**, of Newport, Salop, **John Tully**, of East Grinstead, and **Charles Elsey**, of Maldon, all local secretaries of the Society; **J. P. Provost**, formerly local secretary for Huntingdon; **W. J. Bowles**, divisional secretary for South Kensington; and **Robert Bentley**, formerly Professor of Botany for many years in the Society's School of Pharmacy, and, at the time of his death, Emeritus Professor. Among younger members, **Robert Higgins Davies**, a member of the London Board of Examiners, and **Harry Dixon Fuge**, a former Bell Scholar and demonstrator in the Society's School of Pharmacy. In addition to Professor **Bentley**, several Honorary Members have died in the course of the year: **Christian Brunnengräber**, **Johann Michael Maisch**, and **John Tyndall**. Among the Corresponding Members: **Francisco Bayón**, late Professor of Botany and Pharmacognosy at the National University, Bogota, and **A. Todara**, of Palermo.

**International Pharmaceutical Congress.** The seventh meeting of the International Congress of Pharmacists, which took place at Chicago last September, was an event which was of interest in a much wider range than that of British pharmacy, and for that reason reference to it as an event of the past year has been reserved until after the topics usually dealt with in these retrospects had been disposed of. As an international gathering it cannot be said that the Congress at Chicago was a success, and much as the intercourse between the old and new Continents has been increased in certain directions within the past fifty years, a journey to America is still for the majority an affair of such magnitude that the absence of representatives of many old countries may be well accounted for. In the case of this country the matter was very different, and the direct family relationship with the United States of America was such that there could be no question as to the necessity for the attendance of British representatives at the first attempt of our transatlantic cousins to promote international action for the benefit of pharmacy in general. It is matter for especial satisfaction in that respect to know that the appointment of delegates to the Congress by the Council of the Pharmaceutical Society met with hearty appreciation by the pharmacists of the United States, which was expressed in every form of fraternal cordiality that was possible on their part. As to the work done by the Congress, there is at least some ground for mutual congratulation that, as regards several pressing requirements in this country and in America, the Congress offered opportunity for the expression of opinions that are identical as to the necessities of the new country as well as of the older one.

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## PHARMACY BALLS.

The twenty-eighth annual Chemists' Ball will be held at the Portman Rooms, Baker Street, W., on Wednesday, January 17. It is desired that applications for tickets should be made as early as possible to Mr. **A. J. Phillips**, Honorary Secretary, 156, Cromwell Road, S.W.; Mr. **Richard Bremridge**, 16, Bloomsbury Square, W.C.; or Mr. **T. C. W. Martin**, 36, Camden Square, N.W. We are informed that very few tickets are now left for the first annual ball of the Manchester Pharmaceutical Association, which takes place on the same date, and that no more than the number originally intended will be issued. Application should, therefore, be made at once to the Honorary Secretary, Mr. **A. Blackburn**, 7, Exchange Street, Manchester. The twenty-third annual ball in connection with the Midland Pharmaceutical Association will be held on Thursday, January 18, and tickets may be obtained from the Honorary Secretary, Mr. **T. W. Chapman**, Bristol Street, Birmingham.

# Transactions of the Pharmaceutical Society.

## EXAMINATIONS IN LONDON.

*January*, 1894.

Present:—Mr. Carteighe, President; Mr. Cross, Vice-President; Messrs. Corder, Druce, Fletcher, Gerrard, Greenish, Holmes, Ransom, Saul, Symons, Tanner, Taylor and White.

### MAJOR EXAMINATION.

*Thirty-one* candidates were examined. *Seventeen* failed. The undermentioned *fourteen* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

| | |
|---|---|
| Crouch, William Samuel | Epsom. |
| Hebden, Harry | Bradford. |
| Irwin, Hubert Aloysius | Watford. |
| Kirk, James Robert | Rawcliffe. |
| Ray, George Wheatcroft | Clifton. |
| Roberts, William | Holyhead. |
| Robinson, Charles Edwin | Nottingham. |
| Savage, George Bernard | Brighton. |
| Shepherd, James Henry | Leicester. |
| Smith, Alfred Jason | Gloucester. |
| Smith, Frank | Bayswater. |
| Southall, Alfred William | Birmingham. |
| Surfleet, Arthur Frederick | Louth. |
| Williams, Edwin | Liverpool. |

## MAJOR EXAMINATION QUESTIONS.

*December* 28, 1893.

### PHYSICS.

*Time allowed, Three hours.*

1. Describe fully the essential characteristics of an ordinary chemical balance. (*a*) What would be the effect if the centre of gravity were situated above, below, or at the point of suspension respectively? (*b*) What position should the terminal knife-edges hold in relation to the central point of suspension, and why? (*c*) How would you proceed to test the accuracy of the instrument?

2. Describe briefly all the methods of magnetisation you are acquainted with.

3. Why does a pencil of white light undergo the phenomenon of dispersion when passed through a prism? How would you determine that a given coloured light was homogeneous or monochromatic? What is the cause of the variation in colour of light-rays?

4. Where does the electricity of an electrified body reside, and what influence does the shape of the body exercise upon the distribution of the fluid? Describe experiments in proof of your statements.

5. At what temperature will nitrogen have the same density as oxygen at 0° C., if the density of nitrogen is 14?

### CHEMISTRY.

*Time allowed, Three hours.*

1. How many mono-substitution compounds of naphthalene are theoretically possible, and how may the relative position of the substituents be determined?

2. What is the action of (*a*) hydrogen nitrate and (*b*) hydrogen sulphate (concentrated) on hydrocarbons of the $C_nH_{2n+2}$ and $C_nH_{2n-6}$ series respectively?

3. Give the formulæ and method of preparation of one or two examples of fatty, aromatic, and mixed ketones.

4. Define, with examples, the following terms used in chemistry:—Asymmetry, metamerism, polymerism, equivalent, allotrophy, atomic heat.

5. What are the essential characteristics of true isomorphism? Give several examples.

6. It was found that 0·5 Grm. of a certain metal yielded 0·63036 Grm. of oxide. The specific heat of the metal was found to be 0·035. Find the equivalent, valency, and atomic weight of the metal.

### BOTANY.

*Time allowed, Three hours.*

1. Describe, with the aid of a diagram, the section provided for microscopical examination.

2. Discuss the influence of light on vegetable growth.

3. State what you know respecting the occurrence and function of wax in plants.

4. Describe fully the origin, structure, and development of the pollen of the Angiospermia.

5. How would you distinguish practically between the genera *Iris*, *Crocus*, *Convallaria*, and *Ruscus*?

6. Name the elementary constituents of the food of plants which are essential to their normal development. State briefly what you know respecting the presence of each in the tissues and secretions of the plant.

7. Define the terms lenticel, caruncle, bulbil pyxidium, samara, sorosis, elater.

### MATERIA MEDICA.

*Time allowed, Three hours.*

1. Describe the official method for the extraction of Morphine and Codeine, explaining fully the reasons for each step in the process.

2. Describe the Nutmeg botanically, and state what you know respecting its constituents.

3. How is Pilocarpine prepared? With what other constituents is it associated? Name and describe any commercial varieties of the drug yielding it.

4. What is Elaterin? How may it be obtained? Give tests for its identification and purity.

5. State what you know respecting the secretion of Tragacanth and Gum Acacia. Describe the characters, methods of collection, and constituents of each.

6. What are the characters of Adeps Lanæ? How does it differ in composition from other official fats?

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# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, December 21, Mr. E. Brooke, F.C.S., Vice-President, in the chair. A note on "The Bark of a New Species of Cascarilla" was read by Mr. A. W. Southall, and gave rise to a discussion, in which the Chairman, Secretary, Messrs. Tickle, Gane, and Cooper took part. A paper on "Boron and its Compounds" was then read by Mr. T. A. Henry, who described the various processes which have been used for the isolation of boron, and referred to the recent researches of M. Moissan, which show that boron obtained by most of these methods is very impure, the only method giving it in an approximately pure condition being that of reduction of the oxide with magnesium, first used by Jones in 1866. The powerful reducing properties of the element when thus prepared, the methods by which its atomic weight has been determined and the results obtained, its specific heat, its compounds with other elements, and its reactions were all described. The paper was followed by a discussion, in which the Chairman, Messrs. Tickle, Crouch, Robinson, and the Secretary joined. The meeting then adjourned.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held at 103, Great Russell Street, W.C., on December 14, the President, Mr. E. F. Harrison, in the chair, the following paper was read:—

### PHARMACEUTICAL TRAINING—AS IT IS AND AS IT SHOULD BE.

BY H. A. D. JOWETT, B.SC.

Before commencing with the subject proper, it is necessary to give my idea of what a typical pharmacist should be, inasmuch as the course of training to be followed depends on such an idea.

A typical pharmacist should be a good business man, and also have a sound knowledge of the sciences on which pharmacy is more or less based, and above all should be able to apply that knowledge in the transactions of every day life.

Turning our attention to training as it is, we may divide it into three periods:—

(*i.*) That of apprenticeship. (*ii.*) That during which he is studying the sciences on which pharmacy is based, and preparing for his examinations. (*iii.*) The period of assistantship, during which he is gaining extended experience before commencing in business himself.

An apprentice has often to pass the First examination during his apprenticeship, and in many cases this examination is not passed till he has wasted a year or two of valuable time in learning subjects which ought to have been learnt long ago, and endeavouring to pass an examination which an average third form boy would pass with ease.

Too often no attention is paid to study during apprenticeship, and the youth learns only matters connected with the pharmacy at which he serves his time.

He then generally aims at getting through his examination as soon as possible, with the inevitable result that many present themselves before they are fully prepared, and thus suffer the humiliation of failure. The majority of chemists pass through perhaps a three months' course at some of the schools where preparation for the examination is carried on, and then, whether prepared or not, they go in for the examination on the off chance of getting through, and I regret to say that there is a widespread opinion that it is the proper thing to fail once or twice in the Minor. A small percentage present themselves for the Major, and these are generally better prepared, and they are the men who have taken a longer course and thus obtained a better grasp of their subjects. The last period of training is one in which perhaps the average pharmacist shows to the best advantage. He generally gains experience in one or two businesses in different localities, and perhaps a year or two in one of the historic London houses, where he obtains experience in a special branch of business and perhaps an additional advertisement.

Now with regard to training as it should be. In the first place I consider it necessary that the future pharmacist should have had a good general education, not gauged merely by his ability to pass the First examination. He should then—during a three years' apprenticeship—devote himself to thoroughly learning the business during business hours, and also learn the elements of the sciences bordering on pharmacy. Now in nearly every town there are technical schools or places where classes are held for the South Kensington Science and Art examinations, and I would suggest that all apprentices should attend certain of these classes. During the three years the course I suggest is:—First year, elementary inorganic chemistry, theoretical and practical, and elementary botany; second year, advanced inorganic chemistry, theoretical and practical, elementary organic chemistry, theoretical and practical, advanced botany, and elementary sound, light, and heat; and hird year, advanced organic chemistry, theoretical and practical, and elementary magnetism and electricity. During the third year he ought also to pay special attention to pharmacy and materia medica, and I am of the opinion that during apprenticeship is the time to learn systematic botany, and that there is no better plan than to collect a herbarium.

After apprenticeship the student should have—after a three or five months' course at a school—no difficulty in passing the Minor examination, and he should then proceed to the Major, paying special attention to practical chemistry.

Then it is an advantage to have spent some time in a pharmaceutical laboratory where experience in manufacturing operations and analytical work can be obtained. This should be followed by two or three years' experience in pharmacies in London and the provinces, and then, if possible, by a year in a foreign phamacy.

A pharmacist who has gone through such course as this, or one approximating to it, will then be in a position to embark on business for himself with every chance of success. Further, I hope that such a training, if carried out in a proper spirit, will not only make the individual a thorough pharmacist, but a man—in the highest sense of the word—a man true to himself, for in what respect could one be more so than in the attempt to make himself thoroughly proficient in the chosen vocation of life, and in the furthering and advancement of his calling.

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The President thought the course of study which Mr. Jowett had sketched out an excellent one, and that the systematic study and training would do much for men in after life. Mr. Jowett had not paid much attention to the Preliminary examination, but it was a subject that was always cropping up and was acknowledged by everyone to be unsatisfactory, therefore he thought something ought to be done to amend it. Personally he was of the opinion that the Preliminary should be abolished and certificates of other recognised bodies accepted instead; this was done in some cases now, for, although the Pharmaceutical Preliminary was recognised by no other body, yet the Society accepted other certificates as evidence of proficiency in general knowledge. The science classes in connection with South Kensington were very useful, and apprentices who had passed the examinations in them always did well when they went in for the Minor. He recommended all apprentices, but especially those in the country, to study practical botany, and to collect specimens, in order to become familiar with plants. Apprentices had, however, too often to work too many hours in the shop to allow of their studying at night, for the apprentice days could not be considered the time for the really hard work, that came later. A certain amount of recreation was a very necessary part in the training of a youth. It was a great pity, but nevertheless a fact, that well-trained men, when they were qualified, went on to something else rather than return to pharmacy; perhaps it was because they had not had a good business training, perhaps because they got better paid, certainly it was due in some cases to the work being uncongenial to a man who had had a scientific education, and who found himself unable to apply it to business from want of business training.

Mr. Tickle thought that the Preliminary should be replaced by the London Matriculation examination, and thought it might be beneficial if some technical instruction could be imparted before a youth was apprenticed, to enable him to understand what he was dealing with and his responsibility, and that he might be competent to commence his studies in pharmacy directly he was apprenticed, and not have to waste some years in doing nothing but put up stock.

Mr. Davies suggested that some improvement should be made in drawing up indentures, and a clause inserted to enable the apprentice to leave if he did not find he was being instructed in his business.

Mr. Garnett expressed his agreement with the President's remarks, and thought improvements ought to be made in drawing up indentures, and clauses inserted by which the master should agree to teach his apprentice the rudimentary knowledge of the sciences allied to pharmacy. He believed the reason why so many well-trained men left the ranks of true pharmacy to go on to something else was not because of the remuneration they received but because the work was uncongenial to them after their scientific training.

Mr. Hill did not believe Mr. Tickle's idea of preliminary technical education would be of much avail, for a youth acquired his knowledge of pharmacy best by learning gradually and becoming acquainted with general business principles and the commoner drugs. He agreed with Mr. Jowett that it was incumbent upon parents to see that a youth had a good training, but a large share of the responsibility rested with the youth himself.

Mr. Jones said he believed that the training would be much improved if the scope of the Preliminary was extended. Parents or guardians who apprenticed a boy to a chemist had, as a rule, very little idea what training he would have to go through, and often thought that a three months' course at a school of pharmacy would be ample time to spend in getting qualified. The reason so many men spent so little time at a school was the expense it entailed. He thought the Pharmaceutical Society might do much to help students, who were already qualified, by providing evening lectures for them. Mr. Jowett had omitted one thing from his ideal course of training; all men should join their local association, and if they lived in London the Chemists' Assistants' Association.

Mr. Cave thought the Preliminary was not so much at fault as pharmacy. It was a strange thing that pharmacy could not attract a better educated type of men into its ranks, and he thought it was because better educated men could find a better market for their brains. He agreed with Mr. Jowett that it was very necessary for parents to exercise great caution and forethought when apprenticing a youth to a chemist, and they should be particular about the clauses in the indenture.

Mr. Gane said he wished to adhere to his previously expressed opinion, that chemists were taught too much science and too little business. He did not believe in apprenticing a youth in a so-called dispensing business, for there his experience was all in one direction, whereas if he were bound to a chemist in a good country town he stood a much better chance of getting a good all-round experience. Mr. Gane differed from Mr. Jowett's ideas of teaching an apprentice chemistry and botany first, and thought materia medica was the subject to commence with.

Mr. Melhuish said he considered that apprentices had to work too many hours, and that it sapped their strength mentally and physically, and consequently they were unable to study after doing a hard day's work.

Mr. Long blamed the chemist for the part he played in the training of an apprentice, and considered he ought to teach him the rudimentary knowledge of the sciences allied to pharmacy; it often happened, however, that the master was too ill-informed to be able to do this, and therefore objected to a youth starting to learn while an apprentice.

Mr. Roe did not think it was necessary that a master should teach his pupil his science subjects, but only his business.

Mr. Jowett in reply to the various speakers, said he only wished to emphasise his former remarks, namely, that his idea of an ideal pharmacist was that "he should know his business." Parents and guardians had many difficulties to overcome in apprenticing a youth, but many of the disadvantages following could be remedied by the apprentice himself. Great care should be taken in drawing up the indentures, and apprentices who were now unable to do anything for themselves in this matter ought to bear it in mind when they came to act for others.

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## World's Congress of Chemists.

### THE EDUCATION OF INDUSTRIAL CHEMISTS.*

BY GEORGE LUNGE,

*Professor of Technological Chemistry at the Federal Polytechnic Schools, Zurich.*

The vast domain of chemisty is now divided into a number of fields, worked by different men, and according to methods differing widely from each other. It has not always been so. Berzelius, Dumas, Liebig, and some of the minor stars shining at the same time as these great luminaries, combined the mastery and leadership in inorganic and organic chemistry as a pure science, with applied chemistry in all its branches. In no case, perhaps, has this widely embracing spirit been more clearly exhibited than in that of Liebig. I will not dwell for a moment upon his immortal achievements in pure chemistry; these are, after all, the central tower of the vast building which he has reared, and they form the foremost title to his being classed as the greatest of all the chemical giants our century has produced. But hardly, if at all, inferior to this are his achievements in applied chemistry. Need I remind my hearers where Liebig found those two immensely important fields, agricultural and physiological chemistry, and where he left them? His merits with respect to industrial chemistry are perhaps less generally known and appreciated, but they are also sufficient to warrant the assertion that during the first half of this century no teacher of chemistry, except perhaps Dumas, occupied so high a place in technical matters, and was more frequently appealed to for assistance and enlightenment by chemical manufacturers than Liebig. It was probably not a mere accident that one of the very first men who occupied a chair entirely devoted to technological chemistry in its stricter sense, Friedrich Knapp, was Liebig's brother-in-law. It will not be disputed that the teachers of industrial chemistry of this day, if they look for their spiritual ancestors of half a century ago, can find hardly any men of mark who were at that time mere specialists in technology, but they must and can lay claim to being the humble successors of those grand heroes of pure science of whom I have spoken at the outset, and who have combined excellence in theoretical and in applied chemistry.

It is very different to-day. Hardly one of the men whom we are now proud of revering as our leaders in pure science is intimately connected with industrial chemistry. The last of the great men of whom that could have been said, August Wilhelm Hofmann, has passed away from us; and he had about thirty years ago ceased to be productive in that specialty. Of course, a good many other first-class theoretical chemists have some connection with industrial pursuits; some of them have even taken out patents, and devote part of their time to the "business" element of applied chemistry. But no one of them occupies himself with teaching industrial chemistry, or working, or writing in that field; and few of them have any extended knowledge or interest in that domain. Industrial chemistry in that respect is exactly on the same ground as pharmaceutical, or agricultural, or physiological chemistry. All of them have branched out too far and have become too closely intertwined with other sciences to be embraced by the same men whose life-work lies in pure chemistry; all the less as the latter have been compelled long ago to parcel up their own field among various workers. It is now quite an exception for the same man to pursue more than one of these three directions: General and physical, inorganic and analytical, and organic chemistry. Nay, the time seems near at hand when the organic chemists will be divided into fatty, aromatic, and pyridine chemists, and perhaps some further shades. It is, of course, indispensable for every chemist to be acquainted with all the branches of his profession, and for the elementary grades even the teaching of those various branches may be, and generally is, still left in a single hand. But the creative work is now distributed among quite a number of classes of chemists; and in the highest grades the teaching must be similarly divided among specialists. Thus at the Zurich Polytechnic School there are four full professors for the various departments of pure and applied chemistry, with four assistant professors, and a fifth chair has just been founded.

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* From the *Journal of the American Chemical Society.*

Since industrial chemistry has become an entirely distinct department of science, and since the instruction therein has naturally been entrusted to separate teachers, it is important, both to those who intend to study industrial chemistry as a profession, and to those who have to employ the men educated for that pursuit, that it should be taught in the best possible manner. This is so self-evident that it sounds almost like a common-place to speak of it; and yet it is far more difficult than it looks. Whilst the teaching of pure chemistry is conducted on very much the same lines all over the world, it is certainly not a settled question how chemical technology is to be taught, and great differences of opinion exist in that respect among the leaders in that branch of science, the governing boards of technical schools, and the practical manufacturers who look for the best possible preparation in their employés.

A few years ago public discussions on the best way of educating young men for the profession of technical chemist took place very extensively, both in Germany and England. The societies of chemical industry in both countries, a number of private gentlemen, and in Prussia even the State Department of Education took part in those discussions. I have borne a good share in them myself, and whilst standing up for what both experience and common sense induced me to maintain, I have given due weight to the arguments brought forward from other sides. I have also had a good opportunity of carrying out at least a portion of those views which I then felt bound to take, in one of the most flourishing centres of technical instruction. As far as I can judge, only a faint echo of those discussions has reached the country in which I have now the honour of speaking. But it cannot be different to this great nation how its young men are to be fitted out for carrying on the pursuit of technical chemistry. Indeed, metallurgy, assuredly one of the greatest American industries, is nothing but a special case of technical chemistry, and any remarks made upon the latter apply to a great extent also to the former; but my theme is too large to take notice of the special requirements for the instruction in metallurgy to-day.

I hope, therefore, to be excused, if I touch briefly on the main points of these discussions on the education of technical chemists, so far as they may seem to possess interest for this country. I shall confine my remarks exclusively to the highest class of teaching, such as is practised at universities and polytechnic schools; both because time would not permit me to discuss the lower grade schools as well—most useful though these are in their way—and because I do not possess the necessary personal experience and competence for dealing with that part of the subject.

Before entering upon the course of instruction to be followed at the colleges themselves, we must necessarily look to the foundation of that edifice; that is the previous training of the young men who are to enter a college, at which technical chemistry forms one of the principal branches. I am not sufficiently acquainted with the various classes of schools existing in this country to tread upon this ground; but so many of my hearers have been in Europe, or at least know European institutions, that I may take it for granted that I shall be understood when speaking of the various systems prevailing in Europe. I shall venture even further, by speaking chiefly of the German and Swiss schools, which are generally acknowledged as being among the best of their kind.

In these countries two systems of education are found side by side, and often in tacit or outspoken opposition to each other, viz., the classical or humanistic, and the modern or realistic system. The former, as embodied by the German gymnasia, the English grammar schools, and the French Lycées, builds up the whole of education on the foundation of Latin and Greek, devotes but little time to modern languages, including the mother tongue, about as much to mathematics, and very little indeed to natural science. Youths brought up under this system have very frequently turned out splendid men in all walks of life, and many savants of the first order have sprung from such classical schools. The devotees of this system are not tired of repeating, with that dogmatic tone fostered by itself, that higher mental culture cannot be brought about by any other means. A man, they say, who knows Latin and Greek, or who at least has known something of these languages at a former period of his life, has thereby trained his mind in such wise that it is open to receive knowledge of all kinds, whether philological, or historical, or mathematical, or belonging to the realm of natural science. But they go much further, they boldly say that nothing but this classical training enables a man to thoroughly grasp even the inductive sciences in their highest ramifications. Others may grub about in the lower regions; they may do useful work in chemical analysis, in collecting plants or beetles, or stones, and the like; but the fundamental discoveries, the grand generalisations, all the higher attainments in science are reserved for those who have drunk from the fountain of classical studies. Nor are the men who speak in this way shaken in their belief, which with them amounts to a dogma, by the hard fact that many men of the highest order, of whom I will only mention Faraday and Liebig, do not conform to the rule of the exclusively saving power of classical education.

In this practical country such views are probably very rarely met with, and many of my hearers may think that any discussion about them is like fighting with shadows. But in Europe, at all events, they are realities. Men like Hofmann and du Bois-Reymond (of whom the second later on withdrew from that position) have pronounced in their favour, and probably the majority of German university professors still adhere to them, more or less outspokenly. Up to this moment in Germany the majority of those entering college for the purpose of devoting themselves to the study of pure science, and all those who enter for medicine, come from the classical gymnasia, where Latin and Greek are the central pillars of education; even for the polytechnic schools the classical gymnasia enjoy the same privileges as the *realschulen*, where only Latin or no classical language at all is taught, but in lieu of that far more of modern languages, of mathematics, chemistry, physics, drawing, and so forth. It will be perceived from this that in Europe it is not yet a waste of time and energy to stand up publicly for the conviction that the classical languages, so far from being helpful in the pursuit of scientific and especially technical studies, are most decidedly injurious to it, both directly and indirectly, by blocking the way for other matters of far greater importance. I speak feelingly on this point, for I received a thorough Latin and Greek education, and my original intention was to devote myself to the study of the science of language. I cannot, therefore, be upbraided with talking about matters of which I know as much as a blind man of colours, when discoursing on the value of a training in the classical languages, which I have loved dearly, and in which I have worked with far more than the ordinary zeal of a collegian. But I am bound to say, as a chemist, that I have bought my whistle far too dear. It would not be becoming if I went any further into personal matters, but thousands are in my position, and most of them will, like myself, say that, if we have done our little share in some theoretical or practical branch of natural science, it has most assuredly not been in consequence, but in spite of our classical training, which taught us to esteem words more highly than things, and book-learning as the only kind of knowledge worthy of a noble and really cultivated mind.

(*To be continued.*)

## Parliamentary and Law Proceedings.

### POISONING BY WHITE PRECIPITATE.

The inquiry touching the death of Catherine Jacobs, wife of a bricklayer, of Chenery Street, Ipswich (see *ante*, p. 536) was resumed by the borough coroner at the Town Hall on Thursday, December 28.

Mr. R. W. Brogden, surgeon, who made the post-mortem examination of the body, said he found a small quantity of white granular matter in the stomach and intestines. He analysed some of this, and found it to be a mercurial salt. His opinion as to the cause of death was that death resulted from the long illness, being accelerated by the poison.

Mr. S. R. Anness, in reply to the foreman of the jury, said the white precipitate powders were in a drawer, where they could be procured by any assistant. The poisons mentioned in the first part of the schedule were kept separate. His apprentice was under distinct orders never to sell poisons directly, but refer the applicant to himself or his son, who was fully qualified. It was the practice of the witness to be in his shop from eight to nine o'clock every morning. It was, of course, quite probable that the witness was in the shop on the Thursday morning, and yet was not seen by the lad Jacobs.

The boy Jacobs, recalled, was quite sure the powder was served by the apprentice. Pyman. He went to the shop about five minutes past eight o'clock.

The coroner, in reviewing the evidence, reminded the jury that the Pharmacy Act was passed to protect the public from the sale of poisonous drugs by incompetent persons, and to throw difficulties in the way of purchasing poisons for an unlawful purpose. No doubt an offence of some kind had in the present case been committed against the Pharmacy Act, but they were not the tribunal to deal with that, except in so far as they were of opinion that the death of the deceased had been caused or accelerated by an infringement of that Act. The question whether the apprentice (Pyman) sold the powder was a question of fact. If the jury regarded the evidence of the boy Jacobs as credible—and he gave his evidence very well—they would come to the conclusion that Pyman did sell the powder, and it should be remembered that Pyman himself was careful not to swear one way or the other. Mr. Anness had told the boy—as the apprentice admitted—not to sell any poisons, but to refer customers to him or his son. Therefore the jury would probably agree there was no negligence on the part of Mr. Anness, even assuming he was absent from the shop a minute. The apprentice acted diametrically opposite to his master's direction, and the master could not be held responsible.

After a lengthy consultation the jury found "that the deceased committed suicide during temporary insanity," and, whilst expressing regret that Harold Pyman should have disobeyed his master's instructions in selling the boy Jacobs the poison, considered his action very reprehensible and deserving of censure, and requested that the coroner would reprimand him. The jury also suggested that, considering how frequently—according to the evidence—precipitate powder is sold to children and others, it would be desirable to suggest to the Pharmaceutical Society that this poison should be placed in Part I. of the schedule attached to the Act of 1868, and requested the coroner to communicate to that effect to the Pharmaceutical Society.

The coroner suitably admonished the boy, and Mr. Anness said he had confidence that the lad would be very obedient in the future.—*East Anglian Daily Times.*

### SUPPOSED POISONING BY "INFANT'S PRESERVATIVE."

At the resumed inquiry on Monday, December 18, into the cause of the death of William Johnson, a four months' old child, son of Henry Johnson, of 50, Norman Street, Derby, who died on December 12 under circumstances of a peculiar character (see *ante*, p. 519), the coroner, in summing up, stated that, upon the evidence that day, it was clear that the child died from convulsions, and they heard from Mr Hart, the chemist who supplied the "infant's preservative," that there was no danger in the mixture, and after a great deal of fencing and pressure Dr. McKay had admitted that death was due solely to convulsions.

The jury returned a verdict that the child died from convulsions, and through the foreman expressed their regret that the coroner and jury had been put to so much trouble through a mis-statement of Dr. McKay in the first instance. The jury also wished to make it known that Mr. Hart was in no way to blame.—*Derby Reporter*.

### POISONING BY CARBOLIC ACID.

On Thursday, December 28, a man named Patrick Henessey died at Hull Infirmary from poisoning by carbolic acid. On Christmas Eve some friends called on Henessey, and he went out to fetch beer for them. Whilst he was gone his wife told her son to go upstairs and fetch a bottle of rum from under the bed. The son did as told, and poured out a portion of the contents of the bottle into cups. Henessey, who had returned, emptied his cup at a draught, but the others only sipped, and found something was wrong. Inquiry led to the conclusion that carbolic acid and not rum had been poured out. Henessey was taken to the Infirmary and lingered in great agony till yesterday afternoon. Another man was taken to the Infirmary, but he had not drunk so freely, and has sufficiently recovered to be discharged.—*Morning Post.*

### POISONING BY STRYCHNINE.

An inquest was held by Mr. R. T. Tatham, the Maidstone borough coroner, on Monday, December 18, touching the death of George Frederick Bunyard, aged twenty-one, porter at the Kent County Ophthalmic Hospital.

Mr. P. Adams, house surgeon at the hospital, stated that deceased was a well-conducted young man, and only upon one occasion had any complaint been made, viz., for taking chloroform for his own use. Deceased had frequently assisted in operations, but had no authority to handle the drugs. On the Friday night deceased complained that he was suffering from toothache, and witness prepared some medicine for him, but deceased did not call for it. On the next morning, as deceased was away from his duty, he was searched for and found in bed. In reply to a question deceased said he was going to get up, but not doing so witness subsequently went to the deceased's room and there found he was unconscious. He was blue in the face and breathing heavily, and upon the table close by was a bottle which had contained strychnine.

Dr. Johnson, police surgeon, deposed to making a post-mortem examination and finding death was due to strychnine poisoning, and corroborative evidence having been given, the jury, at the suggestion of the coroner, returned a verdict that deceased died from poisoning, and they also added a rider recommending that poisons kept at the hospital should be locked up. —*Kentish Express.*

### POISONING BY WINSLOW'S SYRUP.

On Wednesday, December 27, an inquest was held at Kirkham, on the body of Margaret Taylor, the two months' old daughter of Hannah Taylor, single woman, residing in Ward Street, Kirkham, who died on the previous Sunday night. The mother said the child had been ill a week, suffering from thrush. She gave him some borax, borax and honey, and syrup of mulberry, and on the Friday obtained a bottle of Winslow's soothing syrup, and the child had half a teaspoonful of it four times that night. On Saturday it was worse, and kept wailing. Dr. Murphy was called in, and afterwards Dr. Court, who ordered the bottle to be thrown away.

Dr. Court said that when he was called in to see the child it was suffering from narcotic poisoning. At least four teaspoonfuls had been used from the bottle of syrup, which he immediately ordered to be thrown away. The cause of death was narcotic poisoning. The principal part of the syrup was a compound of opium and camphor. The doses were far too large, and it was not safe to give it to any child.

A verdict in accordance with the medical evidence was returned, and one of the jury suggested that one of the bottles should be bought and analysed, so that such cases might be stopped.—*Manchester Courier.*

### POISONING BY MORPHINE AND ACONITE.

An inquest was held at Hastings on Saturday, December 30, on the bodies of Albert E. Jasper, son of a Chatham baker, and Frank S. Stower, a chemist's assistant, both young men, who lodged together at 43, Havelock Road, Hastings, and were a few days since found dead in bed. They retired to bed at half-past eleven on Boxing night, and the next morning the landlady was called to the room, when Stower told her that they had taken morphine, and that as Jasper had never taken it before it would make him sleep all day. On passing the room later in the day she heard the men breathing heavily, but could get no answer. She sought assistance, and on the arrival of the doctor life was extinct. Dr. Harris deposed that he found morphine and aconite in the room, and as the result of a post-mortem examination it was found that Jasper had succumbed to morphine, while in Stower's case aconite was the cause of death. In the case of Jasper the jury returned a verdict of death from an overdose of morphine, and in the case of Stower of death from aconite poisoning.—*Pall Mall Gazette*, and *Argus.*

### POISONING BY CARBOLIC ACID.

An inquest was held at the Vicarage, Beckley, on Tuesday, before Mr. Robinson, coroner, on the body of the Rev. George Theophilus Cooke, rural dean, one of the senior fellows of Magdalen College, Oxford, and who for forty-nine years had been vicar of Beckley. Miss Caroline Cooke, sister of the deceased, said he was seventy-four last September. He had been in fair health lately, but Dr. Gray saw him on the 13th ult., when he was suffering from neuralgia and rheumatism, and ordered him a little tonic which he wished him to go on taking. Her brother had taken two bottles of the tonic, and on Saturday she procured a third. At the same time she bought a bottle, twice as large, of carbolic acid. She placed the carbolic acid on the piano in the drawing-room, and took the medicine bottle up to her brother's room, and put it on a table outside the door. She told him several times that she had got his medicine, but he could not have heard her. Shortly before seven o'clock her brother came to her room and said, "There must be some mistake. What I have taken is carbolic, but my name was on the paper outside." She had previously removed the covering from the medicine bottle, but left the paper on the other, and she thought it must have been removed by the deceased himself. He had no sense of smell. She asked him what quantity he took, and he replied, "As near as I could measure it, a little spoonful." She gave him a glass of warm water, and rang for mustard, and while she was waiting she gave him a large glass of ipecacuanha wine. Mustard and water and salt and water were also given. Her brother stood quietly, but did not speak. None of the remedies produced vomiting. Her brother also tried to make himself vomit with a feather. In about five minutes he fell against her and the servant, as they were both supporting him. He was then laid on the floor, but neither moaned nor groaned. She believed he was dead within fifteen minutes of taking the acid. The jury returned a verdict of death from accidental poisoning, and unanimously adopted a resolution conveying to Mrs. Cooke their sympathy in the great blow which had fallen upon her and her family through the death of Mr. Cooke under such distressing circumstances.—*Daily Chronicle.*

## Obituary.

### ROBERT BENTLEY.

My acquaintance with the late Professor Bentley commenced in the year 1850, whilst I was a student at Bloomsbury Square, at the time whe Mr. Smith was the Secretary, before the days of m valued friend, Elias Bremridge. At that time I forme a friendship with Robert Bentley, which has continued to the time of his joining the majority on Christmas Eve, 1893, and during these forty years and more I ever found him a genial friend and a willing helper in our mutual love of botanical pursuits. Quiet and unobtrusive in his habits, always most willing to assist and aid the students at the Square (with whom he was a great favourite at all times), especially in the subjects of materia medica and botany, his urbanity gave him many friends and left him without an enemy, because he never made one, and when the summons came well did the old motto apply —"*Arte bene moriendi.*" Robert Bentley was born at Hitchin in the year 1821. After the usual time allotted to school life he was apprenticed at Tunbridge Wells to one William Maddock, who, whilst pursuing business as a chemist, had also been in practice as an apothecary previous to the passing of the Apothecaries' Act, 1815. During his apprenticeship, in addition to other scientific studies, he commenced that of botany, which ultimately enabled him to take the foremost rank in that interesting science as a painstaking and thoroughly practical teacher, and also as an author. Soon after his term of apprenticeship he entered, as an assistant, the establishment of John Bell and Company, 338, Oxford Street, but this was his only situation as a pharmacist. After the foundation of the Pharmaceutical Society his name appears as one of the earliest associates, and when the School was established at 17, Bloomsbury Square, he attended a course of lectures under the late Dr. Anthony Todd Thompson, and gained the first botanical prize awarded by the institution. This was always a great source of gratification to my friend, and he often referred to it. After his time of study at the Square was over, he entered as a medical student at King's College, having previously matriculated at the London University. In due course he became a member of the College of Surgeons, and then commenced his long connection with the School of Pharmacy at Bloomsbury Square, a connection lasting till 1887, when he felt obliged to resign his chair. A few months afterwards he was elected "Emeritus Professor," a title held till the time of his death. In 1866, Professor Bentley was elected President of the Pharmaceutical Conference at Nottingham, and in the following year he filled the chair as President at Dundee. On both occasions his able addresses were received with the greatest appreciation. For many years he acted as chairman on the Garden Committee of the Royal Botanic Society, Regent's Park, and annually gave the Fellows a course of lectures on botany. In this capacity no student of botany ever failed to obtain from him specimens of plants and willing help to enable him to carry on his researches, given by the Professor with the kindly courtesy so characteristic of him. For about ten years Professor Bentley took part in the editorship of the *Pharmaceutical Journal*, which was then published monthly. The articles he contributed during that time, and subsequently, are too numerous for reference in this short sketch, but they were always of much interest, dealing mostly with his special science of botany. His 'Manual of Botany' has passed through several editions, and the last in 1887 is one of the most complete. As a text-book, if equalled, it has not been excelled by any English work on the subject. In addition to that work, Bentley and Trimen's 'Medicinal Plants,' with its characteristic coloured plates, must not be passed over without notice, as it is a work of the highest reputation, not only in Europe, but all over the world, and will long rank high in the list of standard works. Professor Bentley's appointments outside the Pharmaceutical Society were Professor of Botany and Dean of the Medical School at King's College, and Professor of Botany at the London Institution. Thus, after a most useful and well-spent life he was laid to rest on Saturday last at Kensal Green, in the presence of many old and tried friends and representatives of the colleges to which he belonged, the Council of the Pharmaceutical Society being represented by the President, Mr. M. Carteighe, and Mr. W. Hills, and the staff of the Society's School of Pharmacy by Professors Attfield and J. R. Green. OCTAVIUS CORDER.

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Notice has also been received of the death of the following:—

On December 28, Thomas Clare, Chemist and Druggist, of Scarborough. (Aged 45 years). Mr. Clare was an associate in business of the Society.

On December 30, Thomas Felton, Chemist and Druggist, of Cowbridge, South Wales. (Aged 56 years).

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## Notices of Meetings next Week.

MONDAY, JANUARY 8.

*London Institution*, at 5 p.m.
"The Pond and its People," by Dr. Dallinger.
*Society of Chemical Industry*, at 8 p.m.
Discussion on Report of Patent Law Committee.

TUESDAY, JANUARY 9.

*Photographic Society of Great Britain.*
"Equine Photography," by Captain M. H. Hayes; "Demonstration of the Air Brush," by C. L. Burdick, of Chicago.

WEDNESDAY, JANUARY 10.

*Imperial Institute*, at 8.30 p.m.
Smoking Concert.

THURSDAY, JANUARY 11.

*Chemists' Assistants' Association*, at 8.30 p.m.
Short Papers by Members.
*Liverpool Pharmaceutical Students' Society*, at 8.15 p.m.
Annual Dinner at the Alexandra Hotel.
*School of Pharmacy Students' Association*, at 7 p.m.
"Tobaccos," by Mr. H. B. Cox.
Short Notes by Members.

FRIDAY, JANUARY 12.

*Sheffield Microscopical Society*, at 8 p.m.
Lecture by Dr. Sorby.

SATURDAY, JANUARY 13.

*Pharmaceutical Football Club v.* Holly Club at Harlesden, at 3.15 p.m.

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## Answers to Correspondents.

*Charles Mould.*—"Musk" seed (Fr. *ambrette*), from *Hibiscus Abelmoschus*, Mœnch. (Malvaceæ).

*Ernest E. G. Dennis.*—The pink colour is due to imperfect purification of the compound.

*John G. Smith, Augustus Tyler, H. J. Aubrey*, and *W. Bowden.*—Your communications have been handed to the advertisement agents, to whom they should have been addressed.

*W. K. Harrison.*—In all cases where preparations contain poisons scheduled under the Pharmacy Act, the provisions of that Act of course apply. The fact that the labels on the bottles indicate the presence of substances which with their preparations are specifically mentioned in schedule A, is sufficient to justify you in treating the articles as poisons within the meaning of the Act. It must also be insisted that there is no shadow of justification for assuming that the quantity of poison present must be taken into account in dealing with the provisions of the Act.

*Erratum.*—Mr. R. G. Mumbray desires to point out that the word *insipient* in his letter published last week was a misprint for *incipient*.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Bottle, Hardwick, Sage, Stead, and Tschirch.

## MALAYAN ARROW POISONS.

BY RALPH STOCKMAN, M.D., F.R.C.P.E.

In a previous number of this Journal (May 20, 1893) I gave a very short and imperfect account of the physiological action of an arrow poison used by the natives of Perak. The quantity of material at my disposal was then extremely small, but Mr. E. M. Holmes has since kindly furnished me with a larger quantity, which has made it possible to obtain a more satisfactory, although still very incomplete, idea of its mode of action on animals. The poison is made by the natives from the root-bark of three trees, the extracts being either mixed or used singly to smear on the arrow heads. By the natives the poisons are known as "ipoh-aker," "aker lampong," and "prual" respectively. I have examined the physiological action of alcoholic and watery extracts, made from the bark and wood of the roots of the trees from which the poisons are derived, and find that these all possess toxic effects.

*Ipoh-aker.*—This is obtained from a species of *Strychnos*, as yet unidentified. My few previous experiments led me to conclude that the extract from the bark killed by an action on the heart similar to that of digitalis. Further experiments on rabbits confirmed these results, namely, that the animals died rapidly after subcutaneous administration of a large dose from its effects on the heart, and that the motor nerves remained excitable to electric stimulation for some time after death. I find, however, that in addition there is a well-marked curare-like action, which is much more easily observed in frogs than in rabbits. In the former animals, the terminations of the motor nerves are readily seen to be either partially or completely paralysed, in addition to the digitalis action on the heart.

Extracts made from the wood were very much less toxic than those from the bark. Large doses were required to cause death, and it took place slowly and gradually, and from paralysis of motor nerves in rabbits, not from cardiac paralysis. Both in rabbits and frogs, however, the effects on the heart were quite distinct.

This combined action on the heart and motor nerves is by no means a new observation in plants of the genus *Strychnos*. As is well known, curare is obtained from *Strychnos* species, and several observers, in experimenting with curare, have seen and described an action on the heart as well as on the motor nerves. In 1886, Boehm isolated two alkaloids from curare which he named curine and curarine, and Tillie (*Journ. Anat. and Phys.*, xxiv., 1890) has shown that the former has a digitalis-like action on the heart, while it is the latter which paralyses the motor nerves. It is therefore in the highest degree probable that ipoh-aker, derived from a species of *Strychnos*, also contains two active principles having these different actions. The bark evidently contains more of the cardiac poison, in proportion to the nerve poison, than the wood does.

*Aker lampong.*—This also is obtained from an unknown species of *Strychnos*, but it does not seem to be very toxic; at least, the specimen which I examined must either have contained very little of the active principles, or the latter may have become partially decomposed in making the extracts. From the roots sent me 40 grammes of bark was obtained, and this was thoroughly exhausted with rectified spirit; on evaporating the alcohol 1 gramme of dry extract remained. A half of this (= 20 grammes bark) dissolved in a little alcohol was given subcutaneously to a rabbit, but beyond some depression lasting about two hours, no special symptoms were evinced, and the experiment gave no clue to its action.

With frogs more definite results were obtainable. When the extract was given subcutaneously, the heart was slowed and passed through certain phases as if poisoned by digitalis, ultimately stopping with the ventricle in extreme systole. In some cases the motor nerves were also completely paralysed. So that here, also, we have most probably, as in curare and ipoh-aker, two distinct, active principles, the one acting on the heart muscle, and the other on the terminations of motor nerves.

A watery extract from the wood of the root showed the same actions, although very large doses were necessary to cause death.

*Prual.*—The botanical source of this poison is unknown. I had only a very small quantity of the bark to work with, and made from it an alcoholic extract. When this was given subcutaneously to frogs in a little water, the muscles at the point of injection became almost immediately quite stiff, and there occurred a considerable subcutaneous extravasation of blood. On removing the skin, the blood escaped and the muscles in the neighbourhood were found to be white, dead, and non-responsive to electrical stimulation. The nerves and muscles elsewhere were apparently quite normal. When a very large dose was given, the animal collapsed almost at once, and the heart stopped in diastole. In rabbits no general symptoms were observed, but at the point of subcutaneous injection there was always some extravasated blood and stiffness of the muscles. A watery extract from the wood gave similar results. Apparently its action as an arrow poison consists in disablement of the muscles where the animal is struck.

The mixture of all three substances is no doubt excellently adapted for use as an arrow poison. As I pointed out in my previous paper, its action is different from that of antiarin, or strychnine, or any arrow poison from the same district hitherto described.

## NOTES ON BELLADONNA PREPARATIONS

BY W. A. H. NAYLOR.

### CHLOROFORM OF BELLADONNA.

In a letter to the *Pharmaceutical Journal* of October 14, 1893, Mr. P. W. Squire characterised as wasteful the B.P.C. process for making this preparation, and asserted that it was no improvement upon the original method of simple percolation with chloroform. As the statement was unaccompanied by data and unsupported by any published results known to me, it seemed desirable to put it to the test of experiment.

A belladonna root reduced to No. 20 powder was taken, which, by Dunstan and Ransom's process of assay, yielded ·375 per cent. of alkaloid. This root was used in making the following preparations:—

1. Five ounces was treated as the B.P.C. process

directs, except that in place of simply bruising the root No. 20 powder was taken. After moistening and macerating for four hours it was dried at 140° F. Of this product one fluid ounce was found to contain ·354 grain of alkaloid.

2. Five ounces in No. 40 powder was packed tightly in a percolator and macerated for twenty-four hours with five fluid ounces of chloroform. Percolation was then allowed to commence, and successive quantities of chloroform were poured on until 7½ fluid ounces was obtained. A determination of the alkaloid showed that it was present to the extent of ·486 grain per fluid ounce.

3. Two ounces in No. 40 powder was treated as the preceding, substituting ammoniated chloroform for the simple solvent. This product gave ·325 grain per fluid ounce. The ammoniated chloroform was made by shaking methylated chloroform with one-tenth of its volume of ·880 ammonia, allowing to stand for a few days and removing the supernatant aqueous layer.

4. Two ounces in No. 20 powder was treated as No. 1, save that the drying after maceration was effected at a temperature of 100° F. The direction to "dry carefully" and the discouraging result obtained at 140° F. led to the selection of this low temperature. One fluid ounce yielded ·177 grain of alkaloid per fluid ounce. These results indicate that of a possible yield of 1·093 grain of alkaloid per fluid ounce, not quite half the amount is obtained by the best of these processes. Further, they confirm Mr. Squire's condemnation of the B.P.C. process.

It may be objected that I have taken an unwarrantable liberty with the unofficial formula, inasmuch as the directions are to bruise the root. The plan adopted represents, to my mind, the most practical interpretation of which the direction is capable. Assuming that the operation of bruising is intended to be carried out with pestle and mortar, belladonna obviously, from the character of its tissue, does not admit of contusion like a more fibrous root or rhizome, ginger to wit. By the time every small particle of the root can be said to be brought into the condition to which the term bruised can be appropriately applied, a powder ranging in fineness from 10 to 30 mesh will result. If the coarse powder be sifted out as the operation proceeds, the root will ultimately be obtained in No. 15 or 20 powder.

### LIQUID BELLADONNA PLASTER.

The following experiments may be usefully cited as supplementary to those detailed by me on this subject at the Nottingham Meeting of the British Pharmaceutical Conference (*Pharm. Journ.*, August 26, 1893, and 'Year-Book of Pharmacy,' 1893, p. 344).

The belladonna leaf taken and assayed by Dunstan and Ransom's process yielded ·470 per cent. of alkaloid.

1. From the leaf a liquid extract was prepared by percolation with rectified spirit (*loc. cit.*) of a strength 2 in 1. After dilution with an equal volume of ether and subsidence, the decanted liquid was found to contain 1·4 grain of alkaloid per fluid ounce, showing a loss upon the alkaloidal content of 31 per cent.

2. Two ounces of the leaf in No. 60 powder was packed tightly in a percolator, and 3 fluid ounces of a mixture of equal volumes of ether and rectified spirit were poured over it, and maceration continued for twenty-four hours. At the end of that time percolation was allowed to proceed and sufficient menstruum was added to produce 2 fluid ounces of percolate. It had a specific gravity of ·809, and it contained 1·30 grain of alkaloid per fluid ounce. By renewed percolation with the same menstruum the remainder of the alkaloid was subsequently removed from the marc.

3. A further 2 ounces of the leaf in No. 60 powder was treated with the same menstruum and macerated for the same time as the preceding. The first ounce of percolate obtained was collected apart, and menstruum was added at intervals until the belladonna was wholly deprived of its alkaloid. The second percolate was distilled and the residue dissolved in the reserved portion. The mixture then measured 2¼ fluid ounces. After standing a short time it gave a minute deposit. One fluid ounce of the clear liquid contained 1·56 grain of alkaloid. By this means there is obtained a liquid extract of convenient strength, without loss of alkaloid.

In working the process on a large scale, it is necessary to reduce the residue from the ether-spirit distillate by evaporation on a water-bath, otherwise a smaller reserve portion than need be must be collected, an alternative that is not desirable. Indeed, it is advisable to assay the leaf to be operated upon, so that the volume of the final product may be approximately calculated. If good English leaf be used, the residue from the ether-spirit distillate, after evaporation over a water-bath, will measure about one-fifth the calculated product. This statement is made on the assumption that as high a standard as 1½ grain of alkaloid per fluid ounce will be recognised.

In making the liquid plaster from this ether-spirit extract, the Canada balsam and castor oil of previous formulæ might with advantage be omitted, as the fatty matter dissolved by the menstruum from the belladonna renders the product sufficiently flexible.

To produce, on these lines, liquid belladonna plaster, the following formula is given :—

Take of—

| | |
|---|---|
| Ether-extract of belladonna assayed to contain 1½ grain of alkaloid per fl. ℥ | 20 fluid ounces. |
| Camphor | 130 grains. |
| Pyroxylin | 180 „ |

Dissolve.

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## PRODUCTION OF CASTOR OIL IN INDIA.

The United States Consul at Calcutta, in a late report, says that there are three processes by which castor oil is extracted in the Madras Presidency. (1) The seed is roasted in a pot, pounded in a mortar, and placed in four times its volume of water, which is kept boiling. The mixture is then frequently stirred with a wooden spoon. After a time the pot is removed from the fire and the oil skimmed off. The residue is then allowed to cool, and next day is again boiled and skimmed. The oil thus procured is superior to that first obtained, and is kept separate. (2) The seed is first boiled, and then dried in the sun for two or three days. It is then pounded, and the further process is as in the first method. (3) The seed is soaked for a night in water, and next morning ground in the ordinary native oil mill. The oil is removed by putting the pulp into a piece of cloth, and then squeezing the oil into a pot. This oil is used for lamps and dyeing purposes. In Bengal the castor seeds are partially roasted in a pan and pounded in a mortar without being husked. The stuff so prepared is mixed with water and placed in an earthern pot or jar over a fire, the quantity of water used being two or three inches above the level of the crushed seed. As the water evaporates, the oil rises to the surface, and is then poured into another vessel. The jar is then removed from the fire and allowed to cool, after which some cold water is added to the mixture, when the jar is placed in the sun. The oil still remaining in the mixture then appears at the top, and is removed by hand. The oil thus obtained is boiled again in a separate pan, by which process any moisture and all other extraneous matter are eliminated, and the oil becomes purified and fit for consumption in lamps. There is another process for the extraction of oil from castor seeds followed by the people of the Bengal Presidency, which differs but very slightly from that already described. In this method the seeds are boiled with water before being pounded. When they become soft they are placed in the sun, and when dry are crushed. The following processes are adopted by one of the manufacturers in Calcutta in extracting oil from the castor bean. (1) The seeds are first cleaned with the hand by women. They place a quantity of seed on a smooth board, and with a flat wooden mallet give them one or two strokes, which breaks the seeds into two or three pieces, thus rendering the separation of the husk easy. The broken seeds are then winnowed with a common basket winnower, which removes the husk from the kernel. The kernels are then dried in the sun and afterwards broken by a crushing machine. They are then put in small canvas or gunny bags, and pressed in a hand machine, the oil falling into a pan placed underneath. The oil is collected in large galvanised iron vats, and bleached by exposure to the sun, which also causes the sediment to precipitate. It is next boiled, in order to evaporate any remaining moisture; vegetable charcoal is added to it, and the oil is then filtered through flannel or blotting paper. The oil thus obtained is of the purest quality, used only in medicine, and is manufactured to order. No fire is applied during the pressure, and therefore no irritating part of the seed finds its way to the oil. The yield, however, is 10 per cent. less than that obtained by the following method. In this the seeds are husked, crushed, and pressed as before. At the time of pressing, fire is placed under the machine, the heat from which liquefies the oil and increases the yield, with which, however, a certain portion of the irritating or injurious part of the seeds is mixed. It is then bleached and boiled as before, and filtered with the addition of animal and vegetable charcoal. Some of the jails in India employ many of the prisoners in the manufacture of castor oil. The cleaning and grading of the seeds are done by females, who first remove all extraneous matter, such as dust, pebbles, and foreign seeds, and who then, by means of sieves with different sized meshes, grade the seed into four sizes. The splitting of the shell is done with a machine which consists of two smooth iron rollers placed parallel to one another and working towards one another. It is worked by hand by a simple arrangement of cog-wheels. One of the cylinders or rollers is fixed, the other is movable by a screw adjustment. By means of the latter contrivance, the space between the cylinders can be regulated to the required distance. The space is increased or diminished according to the size of the seed about to be split. A wooden box is placed above the cylinders to hold about eight or ten pounds of seed at a time. These cylinders are about two feet long, so the process of splitting goes on very rapidly. The seed is passed on to the winnowers, who separate the husk from the kernel on large masonry platforms. Sunning is a very necessary step in castor oil manufacture, not only to dry any moisture there may be in the kernel, but to liquefy and facilitate the exit of the oily matter. When the kernel is crushed, it is put into canvas bags, which are placed alternately with iron plates into the screw press. As pressure is applied to the canvas bags, the oil oozes out of them into a trough placed below. At the back of the press a fire is kept up to facilitate the exudation of oil. Each canvas bag holds about a pound of crushed kernels, and each feed of the press requires from one hundred and thirty to one hundred and fifty such canvas bags. The thick slimy oil thus obtained is passed into the hands of the boilers, who, mixing it with water in the proportion of forty parts of oil to from five to eight parts of water, boil it in large copper pans. The boiling of the oil is, perhaps, the most delicate process of the manufacture. To know exactly when to stop the boiling is a point of knowledge acquired by great experience. Thermometers were at one time used, but the results were not so satisfactory, and the boiler is now guided by the eye and by his sense of touch. The castor oil plant is largely cultivated in Assam to feed the silkworm. An excellent paper pulp is made with the bark from the stems. The oil is frequently used by the Indian dyers, and it has the reputation of being one of the best for dressing tanned hides and skins. It is also used for lubricating all sorts of machinery, clocks, watches, etc. It is said to be the best lamp oil in use in India, giving an excellent white light, vying in brilliancy with electricity, far superior to petroleum, rape seed, and all other oils, whether vegetable, animal, or mineral. It is used very extensively by the great perfumers in their articles of manufacture, and it enters largely into the making of some kinds of varnish. At the Allahabad East-Indian Railway Station the lamps are lighted with the gas obtained from the castor oil cake, which has been found to be an excellent material for the purpose. This cake is also highly esteemed as a manure; and it is stated that castor oil and bone meal mixed together form a better fertiliser for sugar-cane than either of these manures alone. In the year 1891-92 the quantity of castor oil exported from India amounted to 3,273,980 gallons, of which the United Kingdom took 1,384,745 gallons.—*Journ. Soc. Arts.*

## THE PRODUCTION OF GAMBIER IN SINGAPORE.

The United States Consul at Singapore says that gambier is there obtained by boiling the leaves and twigs of the *Uncaria gambier* plant, a native of the East, found either wild or cultivated in the Straits Settlements and Johore, as well as in Java and Sumatra. The manufacture of gambier is still conducted on very primitive lines, and with the crudest appliances. A plantation is generally cropped some eighteen months after being planted, and croppings may be repeated as often as four times a year, the operation being conducted with no sparing hand. The remaining process is exceedingly simple. The leaves, twigs, etc., are boiled in a rough caldron until the water in which they are steeped becomes syrup. The extract is then drawn off, cooled, and stirred until crystallisation commences. The gambier is next cut by hand into cubes, dried, either by simple exposure to the air or by smoke, and packed in mats for exportation. The life of a gambier plantation averages about ten years, and, in fifteen years at latest, it is abandoned. The capital required is very small and the returns are rapid, hence the favour with which the industry is regarded by the Chinese.—*Journ. Soc. Arts.*

## THE SALE OF POISON.

Very many lives have been cut short by the incautious administration of preparations in the sick-room and elsewhere. It may be that the severe pressure of modern life has provoked a much more extensive resort to opiates than formerly. But, however that may be, it is clear enough that, notwithstanding the stricter rules regulating the traffic in poisonous preparations, there has of late years been a deplorable increase in the number of deaths from noxious drugs, whether intentionally or accidentally administered. There is obviously something defective in the law which, whilst it imposes on qualified chemists stringent precautions in the retailing of poisons, yet makes it possible for the general public to obtain with little or no trouble preparations containing poison enough to cause death. This anomaly has come in for severe denunciation, but the measure of condemnation has, on public grounds, been none too severe. Take, for example, the case of arsenic. The sale of this deadly mineral poison is placed under the severest restrictions, and it is an offence to sell it in its ordinary form of white powder. Arsenic has to be artificially coloured in order to ensure its more ready identification; and most people know the nature of the formalities with which every chemist has to comply before he allows the smallest quantity of it to leave his establishment. Yet there are certain germicides and other preparations, into the composition of which arsenic largely enters, and these are obtainable in any quantity. Some years ago a "weed-killer" was extensively used on an English farm. A tin vessel, containing the solution, was deposited on a sack of grain. The tin leaked, and the fluid soaked through the contents of the sack to such an extent that, when the grain was converted into flour it was so impregnated with arsenic as to cause the death of several people who had eaten of it. A few of the deaths were traced to this source, but there may have been many others too mysterious to be properly explained. Dozens of cases are on record in which arsenicated sheep dips have been mistaken for beer, with fatal consequences.

Of course it is very difficult to say what the remedy ought to be in these circumstances, because the employment of poisonous preparations in certain industries is imperative. But in other instances an amendment of the law might be enforced with distinct advantage to the public safety. The Pharmaceutical Society fully recognises the desirability of strengthening the Pharmacy Act of 1868, which regulates the sale of poisons; and not long since the Society instituted a prosecution against an unqualified person, who trafficked in a preparation of his own invention. The prosecution broke down on a technical point, but the principle which the Society desired to establish—that unqualified persons have no right to deal in poisons at all, or in any form—is one that ought, on public considerations, to be enforced. Strychnine (in an impure form), laudanum, chloral, and other opiates may be obtained with comparatively little difficulty, and it has really become a pressing question whether the present facilities for distributing such dangerous drugs and compounds should be continued.

And there is another danger to which attention should be directed. The ordinary dispenser knows that it is essential to put up liniments and lotions in bottles totally different to those in which medicines "to be taken" are placed. But the best precautions on the part of the dispenser are very often defeated by public carelessness. The dark fluted bottle in which a poisonous application is first issued to the purchaser is not infrequently used as a receptacle for some perfectly harmless mixture, and thus the distinctive characteristic of the bottle is destroyed. A child who has, for instance, been dosed out of such a bottle naturally concludes that the contents of all bottles of the kind are harmless, and on a future occasion may be tempted to drink a poisonous liquid. Parents and others should be careful never to use a poison bottle for a harmless preparation, and should impress on young people the risk of drinking anything from the dark-coloured bottles, which are meant to indicate the poisonous nature of their contents; and chemists might profit by the warning also, inasmuch as they might insist that all packets of poisonous powders should be wrapped in distinctive paper, either coloured or with a peculiar surface, so that their properties may be clearly indicated, irrespective of the label, which often becomes defaced or gets lost. As a general rule, legislative stringency, combined with greater care on the part of the general public, could do much to lessen the mortality from poisoning, whether deliberate or accidental; and there is a strong case for those who urge that the Acts regulating the sale of poisons should be further amended.—*Bolton Evening News.*

## POISONING BY VANILLA.*

BY JAMES C. WHITE, M.D.

Poisoning by vanilla pods or beans, in the countries where this plant is cultivated, is reported as not very infrequent among the workmen. This plant is cultivated in Mexico, Central America, and the West India Islands, and also in the East. It grows best in Mexico. The beans are collected, put through a "sweating process," are turned frequently under blankets, and sometimes submitted to artificial heat until they assume a dark chocolate or blackish colour. In handling these pods many of the workmen have a dermatitis produced upon their hands and face, and this inflammation of the skin has been attributed to two causes. An acarus affects the pods, and formerly these cases were attributed to the irritative action of this little insect upon the skin. But this is very improbable, because the inflammation comes on too rapidly, and is of a different type from that produced by the presence of any animal parasite upon the skin. In the best variety of pods no artificial means are used for colouring them. When I was writing upon this subject a few years ago, I took occasion to visit the establishment of Mr. Burnett, and inquired about the workmen employed in his factory. He said that no cases of vanilla poisoning had ever occurred there, and he attributed this immunity to the fact that he used only the highest quality of pods. The greatest care is taken in the care of the highest-priced pods, and after they reach the United States they undergo often an additional treatment, if they are not quite cured. They come in sealed tin boxes. Now in the lower qualities of pods it is known that an artificial method is used for colouring them black, and that the material used is the oil found in the rind of the cashew nut, called cardol. This nut is the fruit of *Anacardium occidentale*, and is grown in the West Indies largely, and eaten both raw and roasted. The oriental species is called the Indian marking nut, as it has the same property of turning black any substance with which it comes in contact that the juices of the poisonous forms of *Rhus* possess, and it has likewise the same poisonous quality that they have, so that many cases of poisoning are produced by persons handling these nuts without sufficient care. Charles Kingsley, in his work on the West Indies, describes several cases where cooks and others have been poisoned by roasting them. Cardol is used to colour the poorer qualities of vanilla pods, such as produced poisoning in a patient who recently came to me suffering from dermatitis venenata. They are of the poorer variety, and are worth about four dollars a pound, whereas specimens of the best qualities are worth about twelve dollars a pound. The colour of both is about the same, but there is no doubt, I think, that these poorer ones have been coloured by cardol.

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* From a paper read before the Clinical Section of the Suffolk District Medical Society at its meeting on February 15, 1893, and published in the *Boston Medical and Surgical Journal*, November 2.

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# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JANUARY 13, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

The first meeting of the new year again gave signs of the evil influence which has of late been so prevalent, and while on the last occasion it was the official reporter who was disabled, on the present one it was the Treasurer of the Society, who found himself debarred from attendance at the meeting, and compelled to offer his apology through the President. We are glad, however, to be able to say that he is in a fair way towards recovery.

Reference was made by the President to the death of the Emeritus Professor of Botany as a loss that would be felt not only by the Society, but also individually by the large number of pharmacists who have at some time during the past forty or more years been his fellow students and pupils. The resolution passed expressed this feeling in both respects, and it was impressively emphasised by the remarks of the Vice-President, Mr. Atkins, and Mr. Martin.

The additions to the roll of the Society comprised twelve pharmaceutical chemist members, three chemist and druggist members, seventy-five associates, and eighty-two students.

In the report of the Finance Committee, mention was made of a subscription to the Orphan Fund and a donation to the Benevolent Fund from Mr. Probyn. In other respects it was of the usual character.

On the recommendation of the Benevolent Fund Committee, two grants of twenty pounds each, one of fifteen pounds, one of twelve pounds, one of ten pounds, and one of five pounds were ordered to be paid. The fact mentioned by Mr. Atkins that the amount of money in hand was only £609, while the grants just made and the annuities falling due would amount to £688, shows that the Committee is working quite up to the extent of its means, and that there is need for much farther support from the trade generally.

The appointment of examiners made at the last Council meeting has been approved by the Privy Council, and letters have been received from Mr. KINNINMONT and Mr. STEPHENSON expressing appreciation of the honour done them by the resolution passed last month.

The report of the General Purposes Committee gave the usual account of progress made with cases which have been placed in the hands of the Society's solicitors. In a large number of instances penalties and costs have been paid before trial, and proceedings were ordered in other cases. In reference to a recommendation that white precipitate should be placed in Part I. of the poison schedule as suggested by the coroner's jury at the inquest lately held at Ipswich, it was decided that this change is not desirable.

## PRECAUTIONS AGAINST ACCIDENTAL POISONING.

THERE has been a prolonged and general discussion in the newspaper press on the subject of poisoning by the misapplication of toxic medicaments, and numerous more or less impracticable suggestions have been made with a view to preventing similar accidents in future. It has been generally recognised that the registered chemist and druggist, as a rule, takes what precautions are in his power, even to the extent of considerably exceeding his legal obligations. But the fact cannot be lost sight of that the more formal and complicated the procedure connected with the sale of poisonous medicaments becomes, the more is the public inclined to depend upon these artificial safeguards, and the greater, proportionately, is the risk of accident. It must be held to be an invariable rule that the less the individual is educated to take care of himself, the more helpless he will become and increasingly dependent upon circumstances.

In the columns of a lay contemporary, whose remarks we reproduce at page 564, attention is properly directed to a danger which is all the greater that it is most imminent when the risk appears to be minimised. It is pointed out that, though the skilled dispenser knows that it is essential for the public safety to send out all liniments and lotions in special "poison bottles," which cannot possibly be mistaken if ordinary common sense precautions be observed by patients or their attendants, yet his intentions are often defeated by carelessness on the part of the public. The dark fluted bottle, when once emptied, is not infrequently employed for perfectly harmless mixtures for internal use, children and others thus become habituated to the presence of innoxious liquids in such bottles, and the particular value of this danger signal is thus frittered away.

Similarly, it may be remarked, that, whilst no care is taken by the persons chiefly interested to observe such a simple precaution as reading the label on a bottle of medicine, it is quite useless to expect, as the result of imposing more harassing restrictions upon chemists and druggists, that there will be any appreciable diminution in the number of victims. It is the greatest rarity in this country for a case of accidental poisoning to be due to carelessness on the part of a legally qualified dispenser, and, were the precautions he takes but supplemented by a reasonable amount of care on the part of the public, such accidents as we have recently recorded would be rendered impossible of occurrence. There should be a fixed rule observed in every place where medicine is used that nothing should ever be taken from a bottle until the wrapper is fully removed, and the label should be carefully read each time before a dose is poured out. Further than this, any bottle that has contained poisonous compounds and is not required for the same purpose immediately should be at once destroyed, whilst bottles and packets that contain medicines, and from which the labels have disappeared should, with their contents, receive the same treatment. By the observance of these slight details, there is every reason to believe that the desired protection would be effected much more readily than by the imposition of further legal restrictions, and it is only fair to the chemist and druggist that his constant watchfulness in such matters should be rendered fully effectual by the public lending him their active support and sympathy.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

WE are asked to state that, in the circular issued to members of the Chemists' Assistants' Association last week, the old regulations for the Association Prizes were printed instead of the new ones framed at the beginning of the present session, owing to a printer's error. The new regulations are now being issued.

## POISONING MADE EASY.

THE *Weekly Dispatch*, referring to the recent inquiry into the death of a servant girl at Hampstead (see *ante*, p. 536), remarks that the necessity for placing further restrictions on the sale of poisons is proved almost every day. The poisoning in this case was caused by strychnine, which the girl had bought from an oilshop under the pretence of getting something with which to exterminate mice, and it is pointed out that whilst it would have been difficult for her to procure this poison from a chemist, it was the simplest matter in the world when she applied to the oilman. It is urged that this is a public danger; and the jury's suggestion, that regulations should be adopted to prevent the ease with which such poisons can now be obtained at oilshops, is endorsed. Dealing with the same case, *To-Day* says "there are doors which we are careful to shut, but not to lock; for instance, we buy poison from a druggist only under certain conditions, but we may buy poison from a grocer or oilman with no conditions at all. The only effect of the law is to put a premium upon the trade of the latter. It is true that most of the poisons so procurable produce death in a peculiarly horrible and painful form; but the servant girl who has made up her mind to die does not know this. . . . This is very far from being the first time that incidents of this kind have happened."

### BOURNEMOUTH PHARMACEUTICAL ASSOCIATION.

We are asked by Mr. S. Hardwick, of Bournemouth, to state that a pharmaceutical association has been formed in that town, and that at a meeting held on December 15, rules were adopted, and Mr. Bridge was elected President.

### PHARMACY BALLS.

As announced last week, the Chemists' Ball will be held at the Portman Rooms on Wednesday next, January 17. Godfrey's Quadrille Band will be in attendance as usual, and application for further tickets should be made without delay to the Honorary Secretary, Mr. A. J. Phillips, 156, Cromwell Road, S.W.; to Mr. Richard Bremridge, 17, Bloomsbury Square, W.C.; or to Mr. T. C. W. Martin, 36, Camden Square, N.W. The fourth annual ball in connection with the Brighton Junior Association of Pharmacy will be held at the Royal Pavilion on Wednesday, January 31, when dancing will begin at 9 p.m. Tickets may be obtained of any of the stewards, or from the Honorary Secretary, Mr. A. E. Colman, 1, Bartholomews.

### CARBOLIC POISONING.

It is announced that Sir Walter Foster, Parliamentary Secretary to the Local Government Board, has written to Mr. Ernest Hart, Chairman of the Parliamentary Bills Committee of the British Medical Association, informing him (in reply to a communication urging protective restrictions on the places and methods of sale of carbolic acid with a view to the prevention of the now frequent casualties and poisonings from this cause) that he has been in consultation on this subject with the heads of the medical department, and that the proposed measures for the protection of the public will have the serious consideration of the Board.

### "ENGLISH CHEMIST."

The signification of this title has recently been discussed in the French Law Courts, in a case arising in a town in the South of France, frequented by English and American visitors, where there are about twenty chemists. The complainant, qualified in England and France, brought an action against his neighbour, qualified only in France, for the illegal use of the title "English Chemist," holding that the exhibition of this title was likely to lead the public to believe that he held an English diploma. The defence was that the title had been in use for twelve years, that its use was frequent in similar towns, that a qualified British assistant had always been kept, and that the defendant himself had never professed to be other than a qualified French chemist, with London experience, capable of preparing or supplying English medicines. After full consideration, the decision of the court was in favour of the defendant, on the ground that French law does not protect foreign titles, and compels every chemist in business to pass the French examination, whilst the phrase "English Chemist" is not official in England even. The fact of the defendant having in his pharmacy an English qualified assistant was held to dispose of any idea that he was trading under false pretences, and, even if he had no such assistant, it was pointed out that his French diploma gave him the right to prepare medicines and compound prescriptions according to the customs of any country, and to announce the fact in such way as he might think fit. The complainant afterwards appealed, but the higher court simply confirmed the original decision.

### THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

In consequence of the Chemists' Ball being held on the 17th inst., the usual monthly meeting of the above Association is postponed to Wednesday, the 24th inst., at the Westbourne Restaurant, 1, Craven Road, W., at 9 p.m., when a discussion will take place on the subject of "Affiliation of Pharmaceutical Associations."

### POISON BOTTLES.

A correspondent of the *Globe* observes that polygonal and fluted bottles for poisonous preparations have failed to prevent accidental poisoning generally, chiefly through lack of uniformity of practice. Complicated stoppers, again, are not liked by the public. He suggests, therefore, the use of bottles rounded at the end like test-tubes or soda-water bottles, and asks if a penal enactment to the effect that chemists must always employ such bottles for poisonous medicaments would not prove effectual, if it were also an offence for any person to send out non-poisonous liquids in similar vessels. This saving clause would undoubtedly be essential, and it is extremely doubtful if even then the public would exercise a sufficient amount of caution in all cases. It may be pointed out, by the way, that bottles with rounded ends, as now suggested, were actually introduced for this purpose a few years ago, but were not favourably received. As a rule, purchasers object to pay the increased price for special bottles, and the best intentions of the dispensing chemist are thus thwarted.

### IMPERIAL INSTITUTE.

The annual report of the Imperial Institute for 1893 shows that the progress made in the Indian and Colonial sections during the year has been considerable. In the United Kingdom section it has been considered prudent to delay any preliminary steps for the organisation of the export and import collections, until the Indian and Colonial sections have been more thoroughly completed. There is much material awaiting investigation, but an essential preliminary is the establishment of a Department of Scientific and Practical Research. The Commercial Intelligence Department has progressed but slowly, owing to insufficiency of funds. There are now 571 non-paying Fellows, 816 who have compounded their subscriptions, and 7012 who are annual subscribers, making altogether a total of 8399 Fellows. The number of visitors to the Institute, including Fellows, from May 10 to December 16 last, was 468,571.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, January* 10, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Greenish, Hills, Leigh, Martin, Martindale, Newsholme, Schacht, and Young.

The minutes of the previous meeting were read and confirmed.

The **President** said he had to apologise for the absence of the Treasurer, Mr. Hampson, who had been suffering from the prevailing epidemic, and though he was in a fair way to recovery, it was not advisable for him to leave home.

### The Cape Board of Pharmacy.

The **President** said a letter had been received from the Secretary of this body, expressing its thanks for the kind manner in which Mr. Mager had been received by the Council and the Board of Examiners on his recent visit.

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Letters were read acknowledging the kind expressions of the President and Council at the last meeting with respect to the deaths of the late Mr. Pedler and Mr. Francis.

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### The Late Professor Bentley.

The **President** said he had to move a resolution having reference to the death of an Emeritus professor of the Society, and an honorary member, Robert Bentley. He was a man well known to them all, and many at that table had been his pupils; he himself had been first his pupil and afterwards his friend for about thirty years. The highest testimony which one could pay, perhaps, to his great natural gifts, was to refer to that feeling of affection which he appeared to implant in all his pupils. There must, from the nature of things, be a different standard applicable in judging of the powers of different teachers and lecturers in prosecuting original investigations. There were many men whose means would not allow them to prosecute such researches, though they would be glad to do so; and he believed that Professor Bentley was quite capable of, and would have done original work, if it had not been for the fact that it was necessary for him at a comparatively early age to earn his living, and that the Society in its early days was not able to afford such remuneration to its professors as would relieve them from occupying a portion of their time elsewhere. Professor Bentley's reputation as a scientific man was certainly founded on his connection with the Society as Professor of Botany and Materia Medica. He followed in the footsteps of Anthony Todd Thompson and Pereira in showing how important and far-reaching was the importance of the study of what was in those days called practical botany. Professor Bentley was not a brilliant lecturer, but he was an excellent teacher, and as a demonstrator, with the plants or specimens in his hands, he was as good as anyone he had ever heard. The enthusiasm he was able to impart to his pupils at these demonstrations—especially when they took place, as they did in the old days, in the Botanical Gardens—would never be forgotten by those who had the privilege of listening to them. It was a source of considerable regret to them all, that some years ago he felt it necessary to retire from his position on account of ill health, and although his health was not strong he was somewhat surprised to find that the Professor had succumbed to a short attack of illness not long ago. Besides being a professor of the Society he was a trained pharmacist, and it was only right to remember that he was one of those excellent and brilliant men whom John Bell in early days gathered around him in Oxford Street. The sympathy of Professor Bentley for pharmacists was of the highest order. Those who had not been his pupils, and who were present at the meeting of the Conference when he was President for the first time, probably saw him at his best. Those who had been his pupils and had gone with him on botanical rambles knew him of course more thoroughly, and had learnt to appreciate his personal character as a most lovable man. The work which the Professor did for science was necessarily somewhat limited, because in the field which he had made his own—that of practical botany—the opportunities for teaching and the emoluments derived from it were so limited that except under special circumstances it was very difficult for a man to be able to devote himself to original work. Professor Bentley was also one of the three editors of the *Pharmaceutical Journal* named by Jacob Bell when, shortly before his death, he executed a deed making over that Journal to the Society, those associated with him being the late Professor Redwood and the late John Barnard. In that capacity, Professor Bentley did a great deal of good work, much more than many remembered. He took care to bring forward the value of new remedies and give their natural history and properties, and there were certain volumes which contained papers of his on the new American and other remedies, which were certainly encyclopædic in character, and contained nearly all the information which was now available with regard to most of them. The resolution he had to propose was as follows:—

> "That this Council desires to record the deep regret felt at the death of Emeritus Professor Robert Bentley, honorary member of the Society, Professor of Botany in the Society's School for thirty-eight years, and Professor of Botany and Materia Medica for thirty-five years. It is with a feeling of pride and satisfaction that the Council refers to the long term of valuable service rendered to the Society by Professor Bentley, and to the work he has done outside his professorial duties in the subject he had made especially his own. Professor Bentley's loss will be keenly felt by a large circle of former pupils, colleagues and friends, by all of whom he was greatly beloved."

The **Vice-President** said he should have been content to allow the remarks of the President to stand alone and merely second the adoption of the resolution, but he could not allow the opportunity to pass without paying a tribute to the memory of his dear old friend and master. Professor Bentley was the first to whom he was introduced in that house, and under whom he was advised to place himself at the beginning of his education there, and he very greatly appreciated his lectures. He was a sympathetic and kind-hearted man, one to whom his students invariably looked up with respect and almost reverence, and he might add that he took care in all that he taught, whilst admiring Nature to look up to the Author of all Nature and to reverence Him through His works. He could never forget the kindness he had received at the Professor's hands, and in saying that he felt sure that he must speak for the whole of his pupils scattered throughout the country. It was indeed marvellous how unanimous men who had been educated in that house were in speaking kindly of Professor Bentley. The excursions he took with them were simply delightful, and though many more distinguished scientific men had been laid low during the latter half of the nineteenth century, no better man went to his rest than the friend whose loss they that day deplored.

Mr. **Atkins** said he should like to add one more word of tribute to Professor Bentley, not as an old pupil of his, but as the father of one, who, he was sure, would regret it if something were not said on his behalf, and that of the very large number of young men whom he might be taken to represent. The kindness shown to his students by Professor Bentley and the affection he evoked was the point he wished to emphasise. Professor Bentley never forgot his pupils; he (Mr. Atkins) never met him but he asked after his son, and, indeed, so closely did he follow his career that when a heavy shadow fell across his path there was no man more sympathetic in his feeling towards him than Professor Bentley. It was wonderful to him how a man with such a wide circle of acquaintance, and with so many other calls on his attention, could remember and individualise all his students, because he did not suppose for a moment that his son's was an exceptional case. He entirely agreed with the Vice-President in the reference he had made to the deep religious principles which guided Professor Bentley all through his life, for there was no doubt he was a man of intense religious conviction and conscientiousness.

Mr. **Martin**, as a pupil of Professor Bentley twenty-five years ago, wished to add his tribute to his memory, and to say that whatever love for botany and materia medica he (Mr. Martin) possessed was largely due to the spirit infused into him through Professor Bentley's lectures There was one point in the President's remarks which perhaps required a little explanation. In comparing the teaching of botany and materia medica twenty-five years ago with the teaching of what was now called pharmacognosy, one must not lose sight of the advances which had been made in histology, and the improvement in the microscope. If Professor Bentley had commenced his career as a teacher of botany to-day, without losing sight of the pleasure of it which he had so admirably developed, he would probably have been foremost in teaching it from the histological side as well. His own introduction to histology was through Professor Bentley, and though the state of knowledge then would bear no comparison with the present position of that branch of botany, he was quite sure that the professor was fully abreast of what was then known about it. They must all feel that they had lost a dear friend.

The **President** said Mr. Hampson had expressed his great regret at not being able to be present to personally support the motion.

The motion was then put and carried unanimously.

### Diplomas.

The undermentioned, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Crouch, William Samuel.
Hebden, Harry.
Irwin, Hubert Aloysius.
Kirk, James Robert.
Ray, George Wheatcroft.
Roberts, William.
Robinson, Charles Edwin.
Savage, George Bernard.
Shepherd, James Henry.
Smith, Alfred Jason.
Smith, Frank.
Southall, Alfred William.
Surfleet, Arthur Frederic.
Williams, Edwin.

### Elections.

#### MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Allenby, John Edward ......... | Helmsley. |
| Arrandale, John Samuel ...... | Denton. |
| Hebden, Harry .................. | Bradford. |
| Kirk, James Robert ............ | Rawcliffe. |
| Ray, George Wheatcroft ...... | London. |
| Roberts, William ................ | London. |
| Robinson, Charles Edwin ...... | London. |
| Shepherd, James Henry ...... | Bath. |
| Smith, Frank .................. | London. |
| Southall, Alfred William ...... | Birmingham. |
| Surfleet, Arthur Frederic ...... | Louth. |
| Williams, Edwin ................. | Liverpool. |

*Chemists and Druggists.*

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Barnitt, John ..................... | Leamington. |
| Botham, George ................. | Levenshulme. |
| Coatsworth, Thomas ............ | Yeadon. |

#### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

*Minor.*

| | |
|---|---|
| Barford, Herbert William...... | Manchester. |
| Bridgwood, Walter Stuart ... | Birmingham. |
| Clayton, Thomas................. | London. |
| Dawson, John Harper............ | Fife Keith. |
| Dowswell, Charles Wesley ... | High Wycombe. |
| Evans, Evan........................ | Ammanford. |
| Greenwood, John William ... | Derby. |
| Hargrave, Spencer ............... | Manchester. |
| Hudson, Alfred Wickens ...... | Cranbrook. |
| Hudson, Sutherland ............ | Dumbarton. |
| James, Joshua...................... | Carmarthen. |
| Jones, James ...................... | Bournemouth. |
| Jones, Llewelyn .................. | Conway. |
| Leighton, William Nicholls...... | Hanwell. |
| Leitch, William Alfred ......... | London. |
| Levy, Samuel Edward ......... | Liverpool. |
| Littleboy, John Walter H...... | Woking. |
| Monks, Robert Taylor ......... | Radcliffe. |
| Noak, Walter Frederick......... | Berkeley. |
| Payne, William ................. | London. |
| Reed, John William ............ | Altrincham. |
| Skirrow, Frederick James...... | Horwich. |
| Smith, Charles Clapcott ...... | Pau (France). |
| Southon, James Edward ...... | London. |
| Strickland, Ernest Frank....... | Ealing. |
| Sykes, Frederick John ......... | Colwyn Bay. |
| Wain, Charles Oliver ........... | Haslingden. |
| Walker, Frederick ............... | Crossmichael. |
| Wood, Ernest Thomas ......... | Stonehouse. |
| Wright, George Burkitt......... | Hebden Bridge. |

*Modified.*

| | |
|---|---|
| Bedells, Arthur..................... | London. |
| Butcher, George Stephen ...... | Salford. |
| Clark, Andrew..................... | Edinburgh. |

#### ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Barker, Arthur Brook............ | Mirfield. |
| Bates, Betsy Helen............... | Oldham. |

| | |
|---|---|
| Collier, Frederick Tames | Birmingham. |
| Cooper, George | Glasgow. |
| Curtis, Michæl | Malvern Link. |
| Duncan, Henry Richard | Gloucester. |
| Foden, Thomas Henry | Birmingham. |
| Gamble, Frederic William | King's Lynn. |
| Gibson, Harry | Knutsford. |
| Herman, Robert Charles | Liverpool. |
| Hillman, Edward Stowers | Bristol. |
| Hughes, Joshua Arthur | Abercarn. |
| Humfrey, William Henry | Romford. |
| Jesper, Charles Frederick | Manchester. |
| Jones, Alfred William | Worcester. |
| Jones, John Rothwell | Ormskirk. |
| Jones, Thomas | Llandyssul |
| Kirkness, Robert | North Shields. |
| Laybourn, Robert George | Grantham. |
| Mercer, Frank Norland | Farnworth. |
| Moore, John Edward Langford | Welshpool. |
| Moorman, Charles Edgar | Shanklin. |
| Moss, Ernest Robert | Mansfield. |
| Neave, Arthur Reynolds | Bath. |
| Nicholson, James | Haverfordwest, |
| Osmond, Charles Holdway | Liverpool. |
| Owen, Evan Thomas | Conwil. |
| Park, John | Aberdeen. |
| Payne, Hiram | Brynhyfryd. |
| Roberts, Robert | Menai Bridge. |
| Sherwood, Joseph Henry | Withington. |
| Smith, John Thomas | Gateshead. |
| Smith, Richard Theodore | Ruabon. |
| Smithies, William Henry | Bradford. |
| Southall, Horace | Birmingham. |
| Stavert, Walter | Selkirk. |
| Stewart, Peter Alexander | Hamilton. |
| Wake, George | Howden. |
| Watkins, David | Pentyrch. |
| Wildman, Harry George | Feltham. |
| Wood, Uriah... | Arnold. |
| Woods, Francis Edwin | Birmingham. |

### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Adamson, John | Tottenham. |
| Albery, Henry William | Plumstead. |
| Anderson, Wallace Harry J. | Harlesden. |
| Ashton, Charles Henry | St. Helens. |
| Barron, Robert | Turriff. |
| Beattie, Peter Rattray | Newport (Fife). |
| Beckwith, Christopher | Brighton. |
| Beveridge, Charles Ernest | New Brompton. |
| Bloor, Frederick Arthur | Southport. |
| Blyth, William John B. | Sunderland. |
| Boyce, Herbert George | Downham Market. |
| Brack, David George | South Shields. |
| Bridgen, John Edward | Bognor. |
| Bromley, Albert William | Hull. |
| Burridge, Archibald E. | Portsmouth. |
| Chambers, Fred Aldis | Liverpool. |
| Charles, Gwilym Frederick | Treherbert. |
| Clark, Joseph Branch | Edinburgh. |
| Coates, Henry | Derby. |
| Davies, David Evans | Pontypridd. |
| Davies, John Henry | Flint. |
| Duckworth, William | Bradford. |
| Dutton, Hugh Reginald | Rickmansworth. |
| Ferry, Robert Baily | Hartlepool. |
| Florence, Alexander Andrew | Aberdeen. |
| Franks, Charles | Leicester. |
| Gillis, Adolphus | Sunderland. |
| Gray, John Henderson | Aberdeen. |
| Griffiths, Edwin | Kidsgrove. |
| Halewood, John Henry | Southport. |
| Hartnup, John | Ash-next-Sandwich. |
| Hatfield, Aubrey Haley | York. |
| Hepburn, Robert James K. | London. |
| Hora, Tudor Travers | London. |
| Hughes, Job | London. |
| Jackson, William Kendall | Bradford. |
| King, Arthur Edward | Norwich. |
| King, Charles Edward | Berkhamsted. |
| Knight, William Arthur | Leicester. |
| Lacey, Richard Samuel | Abingdon. |
| Lacey, Thomas | Ketton. |
| Lacy, Arthur E. | Hackney. |
| Laing, Joseph Lythall Leigh | Congleton. |
| Lewis, Thomas Frederick | Brierley Hill. |
| McCune, William | Kilwinning. |
| Manning, Frederick William | Fairford. |
| Marshall, Gervas Gilbert | Cheadle. |
| Massie, John | Midmar. |
| Mitchell, George Alexander | Crieff. |
| Moore, William | Seedley. |
| Newey, Thomas | Chesterfield. |
| Oldham, Harry | Hyde. |
| Pack, Frederick James | Brighton. |
| Percival, Thomas Henry | Walthamstow. |
| Potter, Thomas Burbidge | Leicester. |
| Price, Arthur Henry | Brighton. |
| Redman, Stanley Charles | London. |
| Rees, David Edward | Llandilo. |
| Richardson, Robert | Blackburn. |
| Rist, William King | Southampton. |
| Roberts, Haworth | Bowdon. |
| Round, William Hopkins | Oldbury. |
| Shattock, John Bellett | Bradford. |
| Skelton, Tom | Silloth. |
| Smith, Albert George | Liverpool. |
| Sonley, Walter | Littleborough. |
| Thompson, Edwin | York. |
| Thornton, John Henry | Selkirk |
| Thorpe, Frank Evington | Long Eaton |
| Tree, John | St. Leonard's-on-Sea |
| Varlow, Joseph William | North Shields |
| Vogt, George | Kendal |
| Walker, Albert Storrs | Kendal |
| Wardley, Thomas | Dalton-in-Furness |
| Webb, Ernest George | Bristol |
| Williams, David Isaac | Llanwrtyd Wells. |
| Williams, John Thomas | Carmarthen. |
| Wilson, Ernest Joseph | Southsea. |
| Wilson, Henry Augustus | Kenilworth. |
| Wilson, Joseph Edward | Bath. |
| Woodward, Robert | Old Newton. |
| Yates, Thomas | Cradley Heath. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

### RESTORATION TO THE REGISTER.

The name of the following person, who has made the required declaration and paid a fine of one guinea, was restored to the Register of Chemists and Druggists:—

John Main Palmer, 38, Kenwyn Road, Clapham,
London, S.W.

### ADDITION TO THE REGISTER.

The REGISTRAR reported that—

Thomas Theodore Thompson, 11, Albion Terrace,
Broad Lane, South Tottenham,

having made a declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported, his name had been placed on the Register.

### Report of the Finance Committee.

The report of this Committee was of the usual character, and recommended sundry accounts for payment, including quarterly salaries, etc.

The President (as Chairman of the Committee) moved the adoption of the report and recommendations. He said the receipts during the month were chiefly from examination fees. A subscription of ten shillings had been received to the Orphan Fund, and also the interest on the £1000 which had been lent to the Benevolent Fund and invested in ground rents. On the General Benevolent Fund £13 14*s.* had been received as subscriptions and about £70 in ground rents. On the donation account there had been a receipt of ten guineas from the son of their friend Mr. Probyn. The payments were of the usual character, and included the law costs for the half year, amounting to £703.

The resolution was carried unanimously.

### Report of the Benevolent Fund Committee.

The report of this Committee included a recommendation of the following grants:—

£20 to one of the unsuccessful candidates at the late election. (Aged 85). (Chipping, Lancs).

£20 to another person in the same position. (Exeter).

£15 to another of the unsuccessful candidates. (Burnham-on-Crouch).

£5 to the widow (aged 70) of a registered chemist and druggist and subscriber to the Fund, who has had two previous grants. (Worcester).

£12 to the widow (aged 64) of a member and subscriber, who has had three previous grants of like amount. She is unable to do anything on account of failing sight. (Doncaster).

£10 to the widow (aged 55) of a registered chemist and druggist, who has had two previous grants. This case had been deferred on two previous occasions for further information. (Liverpool).

One application had been deferred for further inquiry.

Letters were read from two annuitants, thanking the Society for the help they had received in the past, and stating that, having lately become possessed of means from other sources, they had thought it right to resign their annuities.

The Committee had recommended that the resignations be accepted.

Mr. Atkins (as Chairman of the Committee) moved the adoption of the report and recommendations. He said the business before the Committee on the previous day was of great interest and importance. The letters from the annuitants reflected the greatest possible credit on the writers, and it was a source of great satisfaction to the Committee to find that the new regulation, which it was feared might cause some friction, had worked so smoothly. In connection with this point he wished to refer with satisfaction to the very excellent work done by the Secretary in connection with the Benevolent Fund. This new departure with regard to annuitants originated, he believed, in his brain, and had been carried out so far very successfully under his guidance, and the Committee was also much assisted in its work by the admirable manner in which he prepared the cases submitted to it. Having read a very pleasing letter which the Secretary had recently received from the little boy who had been placed in the London Orphan Asylum under the provisions of the Hills Orphan Fund, he said the Council might think the Committee had been very liberal in recommending grants, but the first three applicants were unsuccessful candidates at the late election, and the Committee felt bound, knowing the history of the cases, to go to the full limit of its powers. The accounts showed that further efforts were still required in order to adequately maintain the Fund. The quarterly annuities which were now payable would require £556, and the grants now proposed amounted to £82, making a total of £638, whilst the amount in hand was only £609; but of course subscriptions and donations would be coming in. The Committee was working up to the full extent of its means, and he therefore appealed very earnestly to the trade generally, even in this time of depression, to support the Fund more liberally. The demands on the Fund, he regretted to say, were growing, and although the Committee never refused aid to really deserving cases, it was sometimes obliged to give less than it would like. He was glad to see that there was an increase of £81 in the subscriptions for 1893 as compared with 1892, which was satisfactory as far as it went, but was not sufficient to meet the increased demands coming on the Fund. He therefore especially appealed at this New Year's season to local secretaries and others for renewed exertions on behalf of this Fund, which was doing such an incalculable amount of good.

Mr. Hills having seconded the motion,

Mr. Young said it was very noticeable that at the late election those candidates who had been subscribers to the Fund were unsuccessful. He made no complaint of this, but it did justify them in making a special appeal to the large mass of chemists who at present gave no assistance to the Fund, and yet furnished such a large number of candidates.

The resolution was carried unanimously.

### Report of the Library, Museum, School, and House Committee.

*Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average |
|---|---|---|---|---|---|
| November. | Day . . | 541 | 28 | 15 | 21 |
| | Evening . | 231 | 16 | 3 | 11 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| November . . | 212 | 118 | 94 | £1 4*s.* 7½*d.* |

Donations to the Library had been announced (*Pharm. Journ.*, December 16, p. 493), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the undermentioned works be purchased:—

*For the Library in London—*

Wright, Oils, Fats, Waxes, etc., 1894.
Lunge and Hurter, The Alkali-maker's Handbook, 2nd ed., 1891.
Griffiths, Starches used as Food.

*For the Library in Edinburgh—*

Attfield, Chemistry, 15th ed.
Maisch, Materia Medica, 5th ed.
Griffiths, Starches used as Food.

The Professors had attended and reported on their respective classes.

A letter had been received from the Chemists' Assistants' Association, suggesting the formation of a code of ethics. The subject had been considered, and the further discussion adjourned.

The President moved the adoption of the report and recommendations, which was unanimously agreed to.

### Report of Examinations.

| | Candidates. | | |
|---|---|---|---|
| | Examined. | Passed. | Failed. |
| England and Wales:— | | | |
| Major . . . . . . | 31 | 14 | 17 |
| Minor . . . . . . | 202 | 61 | 141 |
| Total . . . | —233 | —75 | —158 |

*First Examination.*

Seventeen certificates were received in lieu of the Society's First examination.

CORRESPONDENCE.

The PRESIDENT said a number of letters had been received from the Examiners and local secretaries thanking the Council for their appointments, and Mr. Stephenson and Mr. Kinninmont had also written expressing their appreciation of the honour done them by the resolution passed last month.

A letter was read from the Privy Council, approving the appointment of the Board of Examiners made last month.

REPORT OF GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitors, stating the progress made with cases placed in their hands. A large number of defendants had paid penalties and nominal costs before trial.

Other cases of infringement were reported to the Committee, and in each case it was recommended that proceedings be taken.

A letter had been received from the coroner for Ipswich giving particulars of a death from taking white precipitate, and enclosing a presentment of the jury to the effect that this substance should be placed in Part I. of the schedule. The Committee recommended that the coroner be informed that in the opinion of the Council this was not desirable.

The Council went into committee to hear and consider the legal portion of the above.

On resuming, the report and recommendations were unanimously adopted.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Thursday, the 11th inst., the Librarian and Curator presented the following reports of donations to the Society's Libraries and Museums:—

*To the Library in London.*

**Allgemeiner österreichischer Apotheker-Verein:**
Zeitschrift for 1893.

**Alumni Association of the Philadelphia College of Pharmacy:**
Report, vol. 29, nos. 4–9; vol. 30, nos. 1–2

**The Editors of the American Druggist:**
Numbers for 1893.

**Philadelphia College of Pharmacy:**
American Journal of Pharmacy for 1893.

**Society of Public Analysts:**
Analyst for 1893.

**The Publishers of the Archiv for Pharmaci og technisk Chemi:**
Numbers from August, 1892, to September 1893.

**Pharmaceutical Society of Australasia:**
Australasian Journal of Pharmacy for 1893.
Annual Report for 1893.

**British Medical Association:**
British Medical Journal for 1893.

**The Editor of the Canadian Pharmaceutical Journal:**
Numbers for 1893.

**The Editor of the Chemical News:**
Numbers for 1893.

**Chemical Society of London:**
Journal for 1893.
Proceedings for 1893.

**The Proprietors of the Chemist and Druggist:**
Numbers for 1893.
Chemists' and Druggists' Diary, 1894.

**Mr. H. Helbing:**
Helbing's Pharmacological Record, 1893, nos. 13–20, 23–24.

**Geological Survey of Canada:**
Annual Report for 1890–91.

**U.S. Department of Agriculture:**
Division of Chemistry, Bulletin, no. 38.

**The Surgeon-General, U.S. Army:**
Index-Catalogue of the Library of the Surgeon-General's Office, U.S. Army, vol. 14.

**Institute of Brewing:**
Transactions for 1893.

**Kaiserliche Akademie der Wissenschaften in Wien:**
Anzeiger, mathematisch-naturwissenschaftliche Classe, 1893.
Sitzungsberichte, Chemie, 1891, 8.–10. Heft; 1892, 1.–10. Heft.

**Linnean Society of London:**
Journal, Botany, for 1893.
List, 1893.

**Manchester Literary and Philosophical Society:**
Memoirs and Proceedings, ser. 4, vol. 6; vol. 7, nos. 1–3.

**Nova Scotian Institute of Science:**
Proceedings and Transactions, second series, vol. 1, no. 2.

**The Publishers of the Ny pharmaceutisk Tidende:**
Nos. 18–26, 1892; nos. 1–20, 1893.

**Pharmaceutical Society of New South Wales:**
Pharmaceutical Journal of Australasia, 1893.

**Pharmacie Centrale de France:**
L'Union pharmaceutique et le Bulletin commercial for 1893.

**Photographic Society of Great Britain:**
Journal and Transactions for 1893.

**Royal Botanic Society of London:**
Quarterly Record for 1893.

**The Director of the Royal Gardens, Kew:**
Bulletin of Miscellaneous Information for 1893.

**Royal Society of London:**
Proceedings for 1893.

**Société francaise de botanique:**
Revue de botanique, Nov. 1891 to June 1893.

**Imperial University of Japan:**
Mittheilungen aus der medicinischen Facultät, Bd. 2, no. 1, 1893.

**Society for the Advancement of Medical Science in Japan:**
Sei-I-Kwai, Medical Journal for 1893.

**Society of Chemical Industry:**
Journal for 1893.

**The Editor of the Timehri:**
Part 2 for 1892.

**The Proprietors of the Western Druggist:**
Numbers for 1893.

**Philosophical Society of Glasgow:**
Proceedings, 1892–93, vol. 24.

**Prof. Dr. Arthur Meyer, Marburg:**
Verfälschurg der Flores Koso mit männlichen Blüthen, von Meyer und Sandlund, 1893.

*To the Library in Edinburgh.*

**Messrs. W. H. Allen and Co., Ltd., 13, Waterloo Place, London:**
London in 1893.

*To the Museum in London.*

**Mr. L. Wray, junr., Perak (Corresponding Member).**
Specimens of Biah leaves.

**Mr. J. H. Hart, F.L.S., Trinidad (Corresponding Member):**
Specimen of Cedron seed, and seeds of *Copaifera.*

**Dr. J. E. T. Aitchison, C.I.E., F.R.S. (Corresponding Member):**
Specimens of Badshah Salep and two other varieties of salep, and of a rhizome named Mámirán.

**Mr. H. N. Ridley, M.A., Singapore (Corresponding Member):**
Specimen of an extract prepared from the rind of the fruit of *Garcinia Indica*, commonly used for dysentery in the Straits Settlements.

**Mr. D. Hooper, Ootacamund:**
Specimen of volatile oil from the leaves of *Toddalia aculeata.*

**Mr. H. Haensel, Pirna-on-the-Elbe:**
Specimen of the wood yielding Champaca oil.

**Messrs. J. Hallawell and Co., Liverpool:**
Specimen of Jaborandi leaves from Paraguay.

**Messrs. Evans, Lescher and Webb, London:**
Specimen of the leaves of *Pilocarpus microphyllus*; specimen of Diosphenol and of a false Jalap root.

**Mr. J. Barclay, Birmingham:**
Specimen of a false Cusparia bark.

**Messrs. T. Christy and Co., London:**
Medicinal root from China, oil seed from Singapore.

**Dr. J. Attfield, through Messrs. T. Christy and Co., London:**
Specimens illustrating the manufacture of Adeps Lanæ.

**Messrs. Lewis and Peat, London:**
Specimens of Zizyphus fruits from Tuticorin.

**Messrs. G. N. Souratty and Co., London:**
Galls of *Tamarix articulata.*

**Mr. E. H. Farr, Uckfield:**
Twenty-four botanical micro-slides, chiefly cryptogamic.*

**Mr. Edwin Terry, London:**
Twenty-four botanical micro-slides.*

**Messrs. Wright, Layman and Umney, London:**
Specimens of African Copaiba and the resin obtained from it.

**Mr. E. H. Gane, London:**
Specimen of fresh Manchineel fruits.

**Messrs. Horner and Sons, London:**
Specimen of the volatile oil of *Barosma betulina.*

*To the Herbarium.*

**Mr. Spencer Le M. Moore, F.L.S., Eastbourne:**
Specimen of the leaf, stem, and fruit of *Simaruba dubia*, from Paraguay.

**Dr. Geo. Watt, C.I.E., Calcutta:**
500 specimens of E. Indian medicinal plants.

*To the Museum in Edinburgh.*

**Mr. J. Jack, F.L.S., Arbroath:**
Specimen of the entire fruit of *Cocos nucifera.*

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## EXAMINATIONS IN LONDON.

*January*, 1894.

(*Continued from p.* 554.)

Dr. Stevenson attended on behalf of the Privy Council.

### MINOR EXAMINATION.

*Two hundred and two* candidates were examined. *One hundred and forty-one* failed. The following *sixty-one* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Anderson, David | London. |
| Bates, Betsy Helen | Oldham. |
| Bowen, John | Machynlleth. |
| Braund, Henry | London. |
| Bridgwood, Walter Stuart | Birmingham. |
| Carter, Henry George | Birmingham. |
| Challis, Frank | Langport. |
| Collier, Frederick Tames | Birmingham. |
| Davidson, Albert Edward | Seaham Harbour. |
| Dawson, Sidney William | Grantham. |
| Dealve, Albert Ernest | Tavistock. |
| Duncan, Henry Richard | Gloucester. |
| Edwards, Thomas | Pontypridd. |
| Elliott, Frank Launcelot | Nottingham. |
| Ellis, Frederic Richard | Liverpool. |
| Foden, Thomas Henry | Birmingham. |
| Fresson, Charles Sherwin | Tuxford. |
| Gamble, Frederic William | King's Lynn. |
| Gee, Ernest Mackworth | Spalding. |
| Gibson, Harry | Knutsford. |
| Gillitt, Albert Ambrose | London. |
| Green, George | Bristol. |
| Greenwood, Solomon | Wisbech. |
| Harkness, James Baird | Bridgwater. |
| Haywood, Herbert | Coventry. |
| Herman, Robert Charles | Liverpool. |
| Hillman, Edward Stowers | Bristol. |
| Hilton, David | East Dereham. |
| Hodder, Harry Gibson | Wareham. |
| Hope, Richard | Westhoughton |
| Hughes, Joshua Arthur | Abercarn. |
| Humfrey, William Henry | Romford. |
| Ingall, Sidney Herbert | Ashford. |
| Jones, Alfred William | Worcester. |
| Judge, Arthur | Belper. |
| Laybourn, Robert George | Grantham. |
| Le Seelleur, Thomas John | Jersey. |
| Littlefield, Robert Dexter | Ventnor. |
| Mercer, Frank Norland | Farnworth. |
| Moore, Francis Henry | London. |
| Moore, John Edward Langford | Welshpool. |
| Moorman, Charles Edgar | Shanklin. |
| Moss, Ernest Robert | Mansfield. |
| Neave, Arthur Reynolds | Bath. |
| Newey, Thomas | Chesterfield. |
| Newman, Ernest Harry | Totnes. |
| Nicholson, James | Haverfordwest. |
| Palmer, George William | Ely. |
| Payne, Hiram | Brynhyfryd. |
| Roberts, Robert | Menai Bridge. |
| Scupham, Frederick Henry | Market Rasen. |
| Shipman, Caleb Edward | Bournemouth. |
| Short, William John | Portsmouth. |
| Smithies, William Henry | Bradford. |
| Springett, Basil Charles Wm. | London. |
| Thompson, Joseph George | Maryport. |
| Udale, George William | Cheadle. |
| Williams, Harry Griffith | Sheffield. |
| Williams, Roger Matthew | Abergavenny. |
| Wood, Uriah | Arnold. |
| Woods, Francis Edwin | Birmingham. |

### FIRST EXAMINATION.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Ball, John Arthur B. | Exeter. |
| Boyack, William Smart | Dundee. |
| Cranston, Edward | New Barnet. |
| Cresswell, John | Barnsbury. |
| Daniels, Frederick William | Leicester. |
| Heitefusz, Friedrich Karl | Brighton. |
| Jones, Noel Crossley | London. |
| Jones, William Parry | London. |
| Judge, Joe | Wakefield. |
| Little, Thomas | London. |
| Marchant, Walter | Walthamstow. |
| Mundy, John Frederick | London. |
| Payne, Herbert | Kensington. |
| Purse, Alfred Henry | Bishopwearmouth. |
| Sanderson, Henry | Manchester. |
| Stratton, William George | Uckfield. |
| Taylor, Arthur Ernest | London. |

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* Detailed lists of these will be published next week.

## FIRST EXAMINATION QUESTIONS.

*January* 9, 1894.

### LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*)

I. (*For all Candidates.*) *Translate into Latin:—*

1. Thou hast not praised the general's army.
2. A great battle has many dangers.
3. The temple was surrounded by the enemy.
4. The walls of the city were one hundred feet high.
5. The men who followed the king were quickly conquered.

II. Translate into English either A (Caesar) or B (Virgil).

(*Candidates must not attempt both authors.*)

#### A. CAESAR.

1. Nam propter frigora, quod Gallia sub septentrionibus, ut ante dictum est, posita est, non modo frumenta in agris matura non erant, sed ne pabuli quidem satis magna copia suppetebat: eo autem frumento, quod flumine Arare navibus subvexerat, propterea uti minus poterat, quod iter ab Arare Helvetii averterant, a quibus discedere nolebat.

2. In castris Helvetiorum tabulae repertae sunt litteris Graecis confectae et ad Caesarem relatae, quibus in tabulis nominatim ratio confecta erat, qui numerus domo exisset eorum, qui arma ferre possent, et item separatim pueri, senes, mulieresque. Quarum omnium rerum summa erat capitum Helvetiorum milia CCLXIII., Tulingorum milia XXXVI., Latobrigorum XIII., Rauricorum XXIII., Boiorum XXXII.; ex his, qui arma ferre possent, ad milia nonaginta duo.

*Grammatical Questions.*—For those only who take Caesar.

1. Decline in full (in the singular) *totius insulae*, and (in the plural) *optimi duces.*

2. Give the principal parts of *possum, nolo, eo, fero, faveo, nuntio, vivo, vincio, sepelio, gero.*

3. Parse fully:—"*qui numerus domo exisset eorum*" (Par. 2).

4. What cases are used in Latin to express (i.) motion to a place, (ii.) measure of space?

#### B. VIRGIL.

1. Sic ait, et dicto citius tumida aequora placat,
Collectasque fugat nubes solemque reducit.
Cymothoë simul et Triton adnixus acuto
Detrudunt naves scopulo: levat ipse tridenti
Et vastas aperit syrtes et temperat aequor,
Atque rotis summas levibus perlabitur undas.

2. Vultis et his mecum pariter considere regnis;
Urbem quam statuo, vestra est; subducite naves;
Tros Tyriusque mihi nullo discrimine agetur.
Atque utinam rex ipse Noto compulsus eodem
Afforet Aeneas! Equidem per litora certos
Dimittam et Libyae lustrare extrema jubebo,
Si quibus ejectus silvis aut urbibus errat.

*Grammatical Questions.*—For those only who take Virgil.

1. Decline in full (in the singular) *totius insulae*, and (in the plural) *optimi duces.*

2. Give the principal parts of *possum, nolo, eo, fero, faveo, nuntio, vivo, vincio, sepelio, gero.*

Parse fully:—"*Tros Tyriusque mihi nullo discrimine agetur*" (Passage 2).

4. What cases are used in Latin to express (i.) motion to a place, (ii.) measure of space?

### ENGLISH.

(*Time allowed—from* 3 *p.m. to* 4.30 *p.m.*)

1. Analyse:—"I was grieved when I heard how he had obtained the character which he bore among his neighbours.

2. Parse the following words in the sentence given in Question 1:—*when, how, which, bore, among.*

3. Correct the following sentences, giving your reasons:—

(i.) She looked splendidly in her new dress.
(ii.) The river in that part was to broad to jump.
(iii.) The box was one of them that opens at the end.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—i am not so sure of that said tunstall though i have never been across the murray and dont intend to go as far as i know as for sheep i hate them and i hate shepherds lazy crawling wretches they and the sheep are just fit to torment one another besides how do you know these great profits are made youre not much of an accountant jack excuse me.

*5. Write a short composition on *one* of the following subjects:—

(i.) A visit to a cathedral or abbey.
(ii.) Prevention is better than cure.
(iii.) Early rising.
(iv.) Diligence makes all things appear easy.

### ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*)

[The working of these questions, as well as the answers, must be written out in full.]

1. What stock of coals is required in order to supply 12 fires for 54 weeks, each fire consuming 1 cwt. 1 qr. 14 lb. of coal weekly?

2. The expense of making the hay of 5 acres 3 roods 15 poles of meadow land amounts to £6 1*s.* 2*d.*; find what the expense is per acre.

3. Simplify $\dfrac{\frac{4}{5} \text{ of } 6\frac{1}{4} \text{ of } 21\frac{5}{8}}{\frac{3}{8}+\frac{6}{7}-1\frac{1}{14}} \div \dfrac{70\frac{5}{37}}{105\frac{5}{74}}$.

4. Multiply 457·61 by ·527, and divide $477\cdot55\dot{8}\dot{5}$ by $21\cdot\dot{3}5\dot{1}$.

5. Into how many farms, each containing 12 hectares 1 are 4½ centiares, can an estate of 1825 hectares 58 ares 84 centiares be divided?

6. A merchant buys 100 gallons of wine for £125, and sells it at 26*s.* per gallon; what is his gain per cent.?

7. A person invests £2852 in railway shares at 115, the annual dividend on each share being £5. He afterwards sells out at 125, and invests the proceeds in a 3 per cent. stock at 93; find the difference in his income.

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* This must be attempted by every candidate.

## Proceedings of Societies in London.

### SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

At the meeting held on Thursday, December 21, the following paper was read:—

#### NOTE ON THE BARK OF A NEW SPECIES OF CASCARILLA.

BY A. W. SOUTHALL.

The bark which is the subject of this note was given to me for examination by Mr. Holmes, who informed me that it belongs to the genus *Cascarilla*, and is probably derived from an undescribed species growing in the United States of Columbia. The bark has a persistently bitter taste, and occurs in pieces from half to one foot long and about half an inch thick. The external portion is covered by a dark brown to light grey cork layer, and is slightly wrinkled longitudinally with occasional transverse cracks. The fracture is splintery and slightly fibrous, showing a slight yellow interior. The internal surface is a rather darker yellow, and shows a number of fine longitudinal furrows.

The bark was examined histologically by Mr. C. E. Robinson, who found that the transverse section shows a number of layers of cork six or more cells deep, inside which are a large number of stone cells tangentially elongated, and, beyond these, bast fibres not so much thickened as those found in *Cinchona*, but like them in the fact that they are short, as seen in the radial section.

A detailed chemical examination of the bark showed that it contained 9·5 per cent. of moisture, and yielded 3·7 per cent. of ash, which contained potassium, sodium, calcium, and manganese. These metals appear to be present in the bark in combination with malic and oxalic acids. Caoutchouc, saccharine matter, and a little tannin were also present, as well as an acid resin, soluble in alcohol or ether, and melting at 221° C. This resin appears to represent the active principle of the bark, and to it the whole of the bitterness is due. When it was fused with caustic potash and afterwards treated with hydrochloric acid and ether, valerianic acid and phloroglucinol were separated in the ethereal solution. No alkaloids or glucosides were found.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

On Thursday, January 4, the first meeting of the half session took place, the evening being devoted to a musical and social gathering. The chair was occupied by the President, Mr. E. F. Harrison, and the arrangements were carried out by Mr. H. A. D. Jowett. The proceeds of the sale of programmes will be devoted to the Benevolent Fund.

## Scottish Transactions.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on January 4, Mr. W. L. Currie presided, and Dr. J. K. Love lectured on "Hearing in Health and Disease." Dr. Love began his lecture by describing the structure of the ear, handing round coloured plates and sections of the head to more clearly explain the different parts. He then treated of the nature of sound, discords, and harmony, having a siren and an arrangement of musical pipes to illustrate the subject. Those who were present enjoyed the lecture greatly, and a vote of thanks, proposed by Mr. Jas. Robb and seconded by Mr. J. A. Russell, was heartily accorded. Dr. Love, after acknowledging the vote, presented a treatise on the subject of his lecture to the library of the Association. Four new members joined.

## Provincial Transactions.

### MANCHESTER PHARMACEUTICAL ASSOCIATION.

At an ordinary meeting of this Association, held this week, at which the President, Mr. G. S. Woolley, was in the chair, Mr. Kirkby mentioned having received a circular issued by a firm of registered chemists, in which they offered for sale at the price of one shilling per bottle medicines for various specified complaints, and these medicines, it was stated in the circular, were prepared in accordance with the prescriptions of various eminent medical men, whose names were also given on the handbill. Mr. Kirkby was of opinion that such a matter as this deserved the attention of the Pharmaceutical Council, and he thought it would be well if that body in open council expressed its disapproval of such proceedings on the part of any individual or firm; it was a reflection upon the whole body of chemists. The President and several members expressed their opinion that such a method of conducting business could not be too strongly deprecated; it was a direct breach of confidence, and it was hoped that the medical men of the district would become acquainted with and take due cognisance of the action of such firms.

## World's Congress of Chemists.

### THE EDUCATION OF INDUSTRIAL CHEMISTS.*

BY GEORGE LUNGE,

*Professor of Technological Chemistry at the Federal Polytechnic Schools, Zurich.*

(*Continued from page* 558.)

I have come to the conclusion that, taking men as they are, and looking at the fact that only a small minority are able to give an unlimited amount of time to their preparation for practical life, those who intend to embark in the career of natural science, in medicine, or in any technical line, ought to content themselves with only one classical language, that is practically with Latin, although some well-meaning enthusiasts would, in this case, plead for Greek. In my opinion a man may get on perfectly well in every one of the branches named before without knowing even Latin, and I make bold to say he may also acquire a mental education as deep and real as that generally approached through the classical languages; but in Europe, at all events for the present generation, a knowledge of Latin is still desirable for those who move in the higher spheres of society, whilst it is the merest sham to pretend that there exists in those circles, with trifling exceptions, more than a faint remembrance of the Greek with which they painfully struggled in their earlier years. The whole of the time given to Greek, and a good deal of that spent on Latin in the gymnasium, is in the *realschulen* devoted to modern languages, to mathematics, to natural science, and to drawing, which subjects, in my firm belief, are not merely more useful for all practical purposes, but form the youthful mind in a far healthier mould than the one-sided pursuit of classical studies.

I am afraid I have, after all, dwelt too long on the chapter of preparatory education, as I am speaking in a country where the immense prestige enjoyed by the classical languages in the greater part of Europe does not exist, and where the opinions which I have stood up for are taken for granted without any discussion. Let us, therefore, now enter upon our proper field, the special studies to be pursued at a university or technical college by those who mean to devote themselves to industrial chemistry.

It will be granted on all sides that at this time of day no technical chemist is worthy of that name who does not possess a sound and thorough knowledge of general chemistry. The time is past when the rule of thumb was paramount; when most factory managers recruited themselves from the ranks of "practical" men, understanding thereby mechanics, manual labourers, or business men, who looked down upon the chemist—if such a person was at all attached to the works—as a testing machine, to be kept in his proper place and to be mistrusted, whenever he ventured for a moment beyond the hole which was by courtesy styled the "laboratory." Nor were these

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* From the *Journal of the American Chemical Society*.

"practical men" altogether wrong in their estimation of the "chemists" they came in contact with; for the majority of those chemists had started as bottle-washers to a "chemist" similarly educated, and had at best acquired some smattering of chemistry at a night school or the like. These men were often qualified by natural quickness of intellect or by a practical turn of mind for better things, but science could not lead them on, for of that they were really almost innocent. This sort of works' chemist lowered the standing of the whole profession. Even many so-called "analytical chemists" were only brought up to this profession as apprentices, as to an ordinary handicraft, and these were only a step or two more advanced in science than those who had commenced with the bottle-washing department. This state of things is not so far removed from the present time as some of my hearers may think. Thirty years ago, when I transferred my abode from Germany to England, I found it, to a great extent, prevailing in the latter country, and it was not altogether unknown in the former. Even then, many scientifically educated chemists had been turned out, chiefly by the German laboratories; but they had mostly to accept positions and salaries corresponding to the low estimation in which the profession of chemistry was then held at most chemical works.

The time I mention saw, however, the commencement of a better era. Just about that epoch the new industry of coal-tar colours, which had commenced with the discovery of Perkin's mauve in 1856, began to assume larger and larger proportions. It had become abundantly clear that that industry could be carried on and extended by none but scientifically trained chemists; more than that, it soon became apparent that an elementary knowledge of chemistry, such as had been thought quite sufficient for practical purposes, would not do here; that chemists were required conversant with every recess of their science, and trained not merely to receive what others had discovered, but to think independently, to strike out new ways, and to enlarge the domain of science. Men really capable of doing this found an abundant field at the colour works, and naturally a demand for good chemists sprung up, which was soon overtaken by the unremitting supply flowing from about thirty German and Swiss universities and polytechnic schools. The men who could not find places in the coal-tar industry overflowed into other domains of manufacturing chemistry, and soon enough it was found that men of that stamp were, after all, far more valuable than the old "testing slaves," as they were sometimes ironically called. The operations of manufacturing chemistry in most of its branches assumed quite a different face under the light shed upon them by science, which transformed them from a string of merely empirical rules into a carefully elaborated and constantly checked system. The difference, both in the quality of the articles and the quantitative yields between our time and thirty years ago, is simply marvellous in many branches of manufacturing chemistry, and nobody dreams of denying that this has been brought about by the firm hold science has now got over that industry.

There is no more need of preaching nowadays that a devotee of technical chemistry must be a good scientific chemist to begin with. True, not every student needs or will penetrate to the more profound depths of science; but so much is universally granted that during his college career he must enjoy the fullest opportunity for this, and that consequently, not merely the universities, but the polytechnic schools and other institutions of the same character, as they exist in this country under various names, must be furnished with first-class teachers and first-class laboratories for general chemistry. Nor can there be the slightest doubt that a good knowledge of physics, mathematics, mineralogy, and geology should be acquired by a technical chemist, not, of course, to the same extent as chemistry itself, but still in a sound manner, not as amateur work. The biological disciplines will never be wanting at such institutions, and a knowledge of them is certainly useful and becoming for every educated man, let alone a man of science, but it would be an exaggeration to say that they are indispensable to a technical chemist as such, and they are often entirely left out in his curriculum.

Strange to say, here many students and even many institutions stop. The young men leave college well grounded in chemistry and the allied sciences, but entirely, or at least almost entirely, ignorant of technology, of mechanical engineering, and of mechanical drawing. This is the case at all German and at most other universities, from which we must here carefully separate the polytechnic schools, and at a number of special colleges of chemistry. Although at some of these institutions some little time is given to technology, it is so little that the results of teaching it are almost nil.

What that means, nobody knows better than I. My college studies fell in a time when the polytechnic schools were still comparatively in their infancy, and although I had from the first intended to devote myself to industrial chemistry, I thought it most natural for that purpose, when I had finished the gymnasium in 1856, to go to a university, from which I came away without any knowledge of mechanical drawing, of engineering, or of chemical technology, apart from some meagre allusions to it in the general chemical lectures. Even now, more than thirty-seven years after that time, hundreds of young men enter upon the same career in the same way. Those of them who either turn over to pure chemistry (whose number must always be very small) or who are lucky enough to find entrance in the scientific laboratory of a colour works, or else who are content to be confined for ever in the laboratory of another kind of chemical works, without a chance of rising to the management, will have done quite right in having carried on their studies at a university. But those who ever mean to rise to the position of superintendent, and to get to practical manufacturing work as soon as possible, will meet with the same difficulties I did. They will soon become conscious of their utter ignorance of the means by which manufacturing processes are carried out on the large scale; they will be constantly put to shame by men or even youths of infinitely less learning, but familiar with the working process; they will commit blunder after blunder when left to themselves, and still worse ones when they try to realise improvements which they have conceived, and may possibly be quite right in principle; and will not even be able to express what they want to an engineer or furnace builder, since they cannot make or even properly understand technical drawings. Some men, when thus thrown upon their own resources, by dint of natural ability and by long and painful labour, get the better of all these drawbacks; but many others do not succeed in their endeavours, and they have either to pass over to some other career or else they remain locked up in inferior places, no better than those of the "testing slaves" I have spoke of.

Far better, on the whole, is the lot of those young men who have acquired a knowledge of technology and engineering. It takes them much less time to be at home in any factory where they may have found a position. No previous teaching at any technical school can get them far enough to enable them to instantly take the manufacture in hand and carry it on like those who are accustomed to do so. But they have been taught to think and to see matters in a technical light; they know where to look for important points essential to the success of operations on a large scale, and they know how to translate any ideas of theirs into reality by such means as are suitable for factory operations. They will, of course, not be entirely exempt from mistakes; but their blunders will hardly ever be so gross as those of their colleagues who have received an exclusively scientific teaching.

A training of the kind just sketched is not, and cannot be, given at an ordinary university, but only at institutions set apart for that purpose, such as the polytechnic schools, in Europe, and the various institutes of technology existing in this country. Strange to say, the hitherto greatest of all industrial nations, England, is altogether devoid of efficient institutes of the kind; and although for many years past this deficiency has been clearly recognised, although the undeniable comparative decline of some important branches of industry in England has been traced to this cause and although there has been no lack of royal or municipal commissions, of public discussions, and even of large expenditure for remedying this state of things, very little has been effected in this direction. Unfortunately for England, her splendid achievements in all realms of mind and matter have created there a feeling of innate superiority over all other nations of the world, more quiet than the loud self-assertion of the French as the "*grande nation*," which professes to march in the van of civilisation, but perhaps even more deep-seated and resolute. This feeling produces a strong undercurrent in English thought, which has hitherto paralysed all useful action in the quarter I am speaking of. The majority of those who have ultimately to decide on matters of technical education have the quiet conviction that, in spite of all the lamentations about the decline of commerce and the uprising of other nations in industrial matters, it is quite sufficient to trust to English common-sense, pluck, and perseverance, which with certainty will tide the country over any temporary reverses, and triumph over all these foreign shams.

Nobody can have a greater admiration for the sterling qualities of the English character than myself. I have spent a dozen of the best years of a man's life in England. I have become a loyal British citizen, and an English author. But it is precisely my sympathy for my adopted second fatherland which makes me mourn that fatal blindness to the defects of English technical education prevailing in that country. I will not speak of the object lessons which this country is daily giving to England, for instance of the fact that the production of that specially British article, iron, is now considerably greater in the United States than in Great Britain, that coal will soon follow suit, and that American machinery of many descriptions has asserted its superiority over English machinery in many important cases. All this is well known and is, however reluctantly, conceded in England; but the English people comfort themselves to some extent with the idea that America, on the one hand, enjoys immense natural riches and facilities accounting for her most signal industrial triumphs, and that, on the other hand, the Americans are Anglo-Saxons like themselves, flesh of their flesh and blood of their blood. It is surely unnecessary to point out the fallacy of the latter argument in a city where born Americans form only a fifth or a sixth of the population, and only a minority of those born Americans are of purely Anglo-Saxon descent. It is very often forgotten on the other side of the ocean that community of language is something very different from identity of race, and just in commercial and industrial matters both the good and the less favourable features of the American and those of the English character are very different. But it is unnecessary to pursue this side of the question any further. Those Englishmen who hold to the firm belief in the innate industrial, colonising, political, and even physical superiority of their race over all others forget that all this is of very recent date. The Anglo-Saxons had conquered Britain more than a thousand years, and the Normans more than five hundred years, before England possessed a mercantile marine or navy to speak of. Four hundred years ago the German Hanse-towns were immensely superior to England as maritime powers, and much more recently this applied to the Dutch. The office of the Hanse-towns, in London, was called the Stahlhof, because in the Middle Ages no iron or steel was made in England, and the importation of those articles from Germany formed a very important branch of trade. The blast furnace and the cementation of steel have been brought into England from Westphalia, the textile industries from the Netherlands. It is barely 150 years since England has taken the lead in these industries. How can Englishmen be blind to the thought that that lead may pass away from them, unless they make the same efforts as other nations to keep abreast with all advances of science?

(*To be continued.*)

## Parliamentary and Law Proceedings.

### POISONING BY LAUDANUM.

An inquest was held on January 5, by the coroner for Newcastle, Mr. Theodore Hoyle, on the body of a man, name unknown, who was found dead in bed at a hotel in Bigg Market, on Wednesday evening. Two bottles were found on a chair by the bedside, both labelled "Laudanum—poison," and bearing the names of different chemists.

The verdict of the jury was that the man had poisoned himself with laudanum, and that there was not sufficient evidence to show the state of his mind.—*Newcastle Daily Leader.*

### POISONING BY CAMPHORATED OIL.

On January 4, at the Marylebone Coroner's Court, Dr. Wynn Westcott held an inquest concerning the death of Lilian Rose Lulman, aged five years, the daughter of a carman. The mother stated that the child had been suffering from whooping-cough, and Dr. Kerr had been attending her. Witness had some camphorated oil in a bottle, which she used for rubbing over the child's chest and back. On Saturday evening witness went to the surgery and obtained some medicine, and upon her return home, between half-past six and seven o'clock, the child said she was thirsty, and wanted a drink. Witness remarked that it was time for her medicine, and poured out a teaspoonful of liquid, which the child took, and then said, "Oh, mother, it is so nasty!" Witness smelled the spoon, and then found that in the dim light she had given her daughter the camphorated oil in mistake for the medicine. The bottle had borne no label.

Dr. Norman Kerr deposed that the child had epileptic convulsions, and was foaming at the mouth, and death was due to poisoning by camphor.

The jury returned a verdict of "Death by misadventure."—*Westminster Gazette.*

### POISONING BY AN OVERDOSE OF CHLORAL.

An inquest was held on Saturday last by Dr. W. Westcott, with reference to the death of William Haslett, 66, stonemason. The evidence showed that he was admitted to the Marylebone Infirmary in November last, suffering from spinal palsy and weakness of mind. He became restless and noisy, and doses of chloral and bromide were administered.

Dr. Lunn, medical superintendent, stated that this failed to take effect, and on January 4 he ordered doses of a drachm and a half of "bromidia." Next morning he learned from Nurse Urridge that she had given an ounce and a half in mistake. The patient grew comatose, and died on Friday from chloral poisoning.

Clara Urridge, the nurse, who appeared deeply to feel her position, admitted her error, and said the "night draughts" were usually of the size of an ounce and a half, and she could only explain her mistake in that way. A verdict of accidental death was returned.—*Standard.*

### POISONING BY CARBOLIC ACID.

On Thursday, January 4, the Middlesbrough coroner, Mr. J. T. Belk, held an inquest at the Alexandra Hotel, Hill Street, on the body of Robert Johnson, tobacconist, aged 54, who had died at his residence in Bolckow Street on the previous night from the effects of a dose of carbolic acid. Deceased sustained an accident to his foot about ten weeks ago, and, having since been out of employment, he became at times greatly dejected. On Wednesday night he was found ill in bed, evidently suffering from the effects of a dose of carbolic acid, a bottle of which was found near him. Dr. Veitch's assistant was called in, and applied the stomach pump, but the deceased gradually sank and died an hour afterwards. A verdict of death from a dose of carbolic acid was returned.—*Yorkshire Herald.*

### DEATH FROM DRINKING SULPHURIC ACID.

Mr. E. N. Wood held an inquest this week at the "Prince Arthur," Beckenham, as to the death of Mr. Sidney Atkins, relieving officer and registrar for Beckenham and West Wickham. The inquiry showed that the deceased returned from a party about 2m. He asked for something to drink, and was told there was only ale in the house. He knew it was kept in the dye-house, and with the aid of some matches searched out a gallon jar, which he took into the house, and part of the contents of which he poured out into a tumbler. After taking a mouthful he said, "It's hot beer." On looking at the jar it was found to be one which contained common sulphuric acid. Emetics were given, and the deceased attended medically, but his throat and gullet and stomach had been so injured that he died on Wednesday, after a week of terrible suffering. The medical testimony was to the effect that the glottis, gullet, and stomach were entirely denuded of mucous membrane, and the gullet was full of ulcers and sloughing. The jury returned a verdict that the deceased died from drinking vitriol in mistake for beer.—*Morning Advertiser.*

### POISONING BY CARBOLIC ACID.

At the Royal Infirmary, Bristol, on Monday, the city coroner, Mr. H. G. Doggett, held an inquest on the body of James George, who died at that institution on Friday afternoon from the effects of carbolic acid taken by himself.

Dr. Henry Lawrence Ormerod said that the man was admitted to the Infirmary suffering from carbolic acid poisoning. He died about five minutes after admission. Witness made a post-mortem examination, and found that death was due to poisoning. He thought that the man must have taken from half an ounce to one ounce of the poison.

The coroner remarked that there could be no doubt that the man did it through drink.

A verdict of "Suicide whilst of unsound mind" was returned.—*Bristol Mercury.*

### A PRESCRIBING HERBALIST.

On Tuesday, Mr. Wynne E. Baxter, coroner, held an inquiry at the Poplar Town Hall, on the death of Ada Jessie Leonard, aged three, the daughter of a dock labourer, of Limehouse.

The mother stated that on Monday week the child was ill, and she took her to a "Dr." James, in Parnham Street, who prescribed for the child, saying that she had bronchitis and measles. On Thursday the child was worse, and she sent for "Dr." James. He came, and again prescribed. On Friday the mother got an order for the parish doctor, who saw the child, but death took place shortly afterwards.

Dr. Miller, of Commercial Road (for Dr. Stonham, absent in the country), said the cause of death was bronchial pneumonia and measles.

Robert Hickton, of Parnham Street, Limehouse, said that he was a herbalist, and kept a shop. The name over it was "James." He had no medical qualification. He prescribed a bottle of medicine for bronchitis at the mother's request, and also called and saw the child. He was not being paid for his visit. He thought the child was suffering from measles, and told the mother so. Fourpence was charged for the bottle of medicine. He had been in business seven weeks, but was not in the habit of prescribing medicine.

The jury returned a verdict of natural death, the coroner remarking that a public exposure in the press would do far more good than any censure passed on the herbalist.—*Daily Graphic.*

### PROCEEDINGS UNDER THE IRISH PHARMACY ACT.

#### ILLEGAL SALE OF FELLOW'S SYRUP.

In the Northern Police Court, Dublin, before Mr. O'Donel, on January 5, a summons came on for hearing in the case of the Pharmaceutical Society against Messrs. Todd, Burns, and Co., for keeping a shop open for the sale of poison contained in Fellow's syrup, which contained a quantity of strychnine. The defence was that the bottle was sold without knowing the contents. Formal evidence having been given, the magistrate imposed a fine of £5.—*Irish Times.*

### ILLEGAL SALE OF ARSENIC.

At Boston, Lincolnshire, on January 3, Messrs. Pilley and Son, chemists, Boston, were charged with having sold 1lb. of arsenic on October 14 to a person unknown to them, and without the presence of a witness whom they knew.

Superintendent Crawford said that some time ago he received information from Mr. Hornbuckle, farmer, Wrangle, that some horses of his had died from the effects of poison, and he ascertained that a man named Willerton, in Mr. Hornbuckle's employ, purchased some arsenic at defendants' shop, and although he did not intentionally give the horses more than a proper quantity, he left the bulk within the animals' reach, and they took enough to cause their death. The defendants' book showed that the arsenic was sold without the presence of a witness.

Mr. H. Pilley admitted the offence, and expressed regret for the negligence. Defendants were fined £5 and costs.—*Yorkshire Post.*

## Reviews and Notices of Books.

### THE DISEASES OF DOGS AND CATS, AND THEIR TREATMENT. By a Veterinary Surgeon.*

This little *vade mecum*, evidently the production of a well cultured and practical veterinarian, although professedly written for the chemist, may be regarded as equally well, if not better, adapted to supply a want that must be felt by many certificated members of his own profession, the majority of whom, it is stated, have little or no knowledge of dogs and cats, even after the usual course of training and instruction at veterinary colleges, where it is stated that anything but horses and cattle are treated with neglect. If these conditions really exist at the present time it is to be hoped that the recently extended curriculum will secure the much to be desired remedy. The book suggests, so far as doses are indicated and directed, an extremely wide range. In addition to homœopathy pure and simple, we find almost homœopathic doses of liq. ammon. acet., and also heroic doses of antim. pot. tart. and calomel; these extremes, however, are exceptional. The book abounds in suggestions, and contains many rational and good formulæ for the use of comparatively new remedies, both external and internal, which have been introduced and used by the author and other skilled veterinarians with success in the treatment of canine and feline ailments. In regard to the former, the chemist will find many useful hints that he might appropriate and use with advantage alike to himself, to his customers, and to their pets, but before the chemist who has not had the opportunity and advantage of special veterinary or medical training attempts to diagnose and undertake the treatment of acute internal diseases, or ventures to use instruments useful only in well-trained hands, there ought to be, and should be, the necessary preliminary training, and for this purpose a far wider field of knowledge cultivated than is offered in this small but admirable treatise upon the diseases of dogs and cats and their treatment.

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* London: Offices of the *British and Colonial Druggist.* Pp. i.-vii., 1 to 200. 2s. 6d.

## Obituary.

Notice has been received of the death of the following:—

On December 18, Philadelphus Jeys, Chemist and Druggist, late of Northampton. (Aged 79 years).

On December 22, Thomas Prideaux Saunders, Chemist and Druggist, of Weston-super-Mare. (Aged 58 years).

On January 8, Martha Cam Bills, Chemist and Druggist, of Bishop's Castle. (Aged 78 years).

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### Percentage Solutions.

Sir,—In your issue of 30th ult., a letter on percentage solutions appeared, purporting to be written by Mr. John H. Fisher, Dunfermline. I was surprised at the tenor of it, and should have judged Mr. Fisher to be incapable of writing such an epistle. I should have allowed it to pass unnoticed, but that he pointedly referred to me, and seems to entertain an erroneous idea of my position in regard to this question. I am unaware that I have ever been involved in any embroglio, in any sense of the word, in connection with this subject; and, had I been, I must have known it. Previous to November, 1888, some persons were engaged in a fray concerning it in the pages of the *Chemist and Druggist*, but I was not among them, nor have I had anything to do with any of the childish questions which have appeared on the subject since then in the pages of your own or other journals. On the 21st of that month I tried to do a little to dispel the haziness which seemed to surround the subject; but evidently the fog which beclouds the mental vision of a few has proved impenetrable to that or any subsequent ray of light which has been shed forth. I also fail to see wherein I have indulged in any abstruse reasoning on the matter; if it has seemed so to others, that is not my fault. I tried to make it plain; my papers dealt with facts, and were based on experiment. I had no idea that they were in any way learned, but have always considered them extremely elementary, and I must confess I think Mr. Fisher has no true conception of what a scholastic disquisition really is when he compares my writings, even in a remote degree, with the speculative reasonings of the mediæval schoolmen.

The position which I hold in relation to the so-called percentage solutions of the Pharmacopœia is this. The Pharmacopœia is the standard for the preparations which it authorises; a standard ought to be exact. The Pharmacopœia aims at having a class of preparations which shall contain one part of active ingredient in one hundred fluid parts; it fails to accomplish this. I have pointed out the inaccuracy, also that there is no necessity for it, and how it can be rectified. Thus the matter stands, as far as I am concerned. I express no opinion as to the relative value of the two methods of setting out the formulæ, I can work with either. I have never at any time said or inferred that the Pharmacopœial solutions were scientifically real or true percentage solutions, but have always referred to them as "what may be called" or "what are known as" the 1 per cent. solutions, thus using the phrase in the loose colloquial sense in which it has been applied since the issue of the Pharmacopœia, 1885, if not before. Only once, to my knowledge, have I used the words "true 1 per cent. solution," and these might be distorted so as apparently to refute what I have said above, but when they are read together with the context it ought to be apparent to anyone with a knowledge of the subject and a fair acquaintance with the language generally spoken in the British Islands, what is the exact sense in which the word "true" is used in the phrase referred to.

The preparation of scientifically true percentage solutions ought to present no difficulty to any person worthy of being called a chemist, no matter what the densities of the active ingredients and solvents may be, and even the youngest apprentice ought to be able to work out the problem arithmetically if all the terms were given him, and also be able to tell how much of the active ingredient is contained in a fluid drachm. Take the first example given:—Liq. hydrarg. perchlor., 5 per cent., ℥iv. Here there is no difficulty either in calculating exactly the required quantities or in preparing a practically accurate solution. Four fluid ounces are equal to 1750 grain measures, one twentieth of that is 87·5, the specific gravity of mercuric chloride is 5·2 (Cooley), therefore the volume of 87·5 grains of it is 16·827 grain measures. Deducting 87·5 from 1750, and add 16·827 to the remainder, we get 1679·327 grain measures as the volume of a 5 per cent. solution containing 87·5 grains of mercuric chloride. Then as 1679·327 is to 1750 so is 87·5 to 91·182. Working out as before we find that 91·182 grains of mercuric chloride yield 1749·993 grain measures of a 5 per cent. solution. As there would be some difficulty in weighing 91·182 grains on an ordinary dispensing balance with the usual weights, and as it is possible to weigh 91·25 grains under these conditions, the latter weight might be taken. Calculating on the above lines we find that that weight will yield 1751·298 grain measures of a 5 per cent. solution, which is surely near enough to satisfy the most fastidious. Again, take the other example, glycerin. hydrarg. perchlor., 5 per cent., ℥iv. Wherein lies the difficulty there either? The specific gravity of official glycerin is 1·25, four fluid ounces therefore weigh five ounces, or 2187·5 grains, one-twentieth of that is 109·375, which, divided by 5·2, gives 21·0337 grain measures as the volume of such a weight of mercuric chloride. Deducting 109·375 from 2187·5 we obtain 2078·125 grains as the weight of glycerin required to make five ounces by weight of a 5 per cent. solution. 2078·125 grains of glycerin is equal to 1662·5 grain measures, and on adding to that the volume of the mercuric chloride, we obtain 1683·5337 grain measures as the volume of five ounces of a 5 per cent. glycerin. hydrarg. perchlor., or about 67 grain measures short of four fluid ounces. Using the data we now have we get 113·698 grains and 2160·167 grains as the weights of mercuric chloride and glycerin respectively required to produce four fluid ounces. In practice it would be more convenient to take 114 grains and 2166 grains, which together weigh 2280 grains and measure about five minims more than four fluid ounces. In the foregoing examples I have assumed that the hypothetical doctor wanted in each instance four fluid ounces of a true 5 per cent. by weight preparation. Had I been inclined to be scholastic, I should first have debated whether he meant four fluid ounces or four ounces by weight, and also whether he meant 5 per cent. by weight or by volume. Had I done so, I have no doubt I should have been successful not only in confusing myself, but in broaching a subject, the discussion of which might have proved interminable. In my opinion, a little common sense is necessary in the practice of pharmacy, as well as some scientific knowledge. I have had a little experience in dispensing, and were I to receive a prescription ordering a percentage preparation, I should dispense it in the way which seemed to me most likely to carry out the prescriber's intention, and if I had any doubt, I should apply to him for an explanation, and not propound a conundrum to the editor or readers of any journal. I believe that medical men generally in this country when they prescribe a per cent. solution containing a solid for the active ingredient use the term in its conventional, though inaccurate sense, and mean a certain number of parts by weight in one hundred fluid parts—when it is to be used in minims they intend it to be made so as to contain so many grains in one hundred minims. Mr. Fisher appeals to Professor Attfield, but I am inclined to think that the latter will not reply with a simple affirmative to the question as it is stated. In conclusion, allow me to emphasise the concluding sentence in your editorial on page 406 of the current volume, and to recommend it to the careful perusal and thoughtful consideration of all whom it may concern.

*Edinburgh.* C. A. MACPHERSON.

### AFRICAN COPAIBA.

Sir,—The abstract of the paper by Heckel and Schlagdenhauffen on the "Salikounda Bean," the source of which they refer to a species of *Copaifera*, is interesting, as pointing to the existence of another African species of that genus. Although it has not been possible to determine the exact botanical source of the African copaiba reported on in the *Pharmaceutical Journal* ([3], xxii., p. 489; [3], xxiv., p. 215), it seems unlikely that it is the product of the same *Copaifera* for two reasons: first, that the oleoresin possesses no trace of the odour of coumarin; and, secondly, the resinous exudation does not become spontaneously hard. The resin described as exuding from *Copaifera Salikounda* in this respect appears to agree more closely with that described by Bennett as exuding from a species of *Guibourtia*, closely allied to *Copaifera Guibourtiana*, which produces a body like copal. The true *Copaifera Guibourtiana* is, moreover, the only species hitherto described as being indigenous to Upper Guinea and Sierra Leone. The African copaiba oleoresin which I have examined was sent to this country by the Royal Niger Co., and was therefore probably derived from a district a considerable distance from Sherboro' Island and Cape Verga, although approximately in the same latitude.

*Southwark, London.* JOHN C. UMNEY.

### JALAP AND JALAPIN.

Sir,—After looking through Mr. C. E. Robinson's results published in his paper on "Commercial Jalap and Jalapin," we must all agree that he has operated upon particularly good specimens of jalap. Before, however, the proportions of resin obtained are taken as being from representative samples, it is, I think, necessary to know something more about the tubercles examined, and how the author treated the original alcoholic extract obtained from them. My experience is that the proportion of resin contained in jalap frequently falls much below 10 per cent.; this is both from experimental estimations and the actual working of jalap for resin. I cannot, therefore, but suspect that the yields obtained by Mr. Robinson are due either to specially picked samples or to the imperfect washing of the original alcoholic extract. Messrs. T. and H. Smith, commenting upon a paper read by Mr. A. Southall before the British Pharmaceutical Conference of 1867, stated that they had never obtained more than 15 per cent. of resin. So that Mr. Robinson, in less than a dozen trials, has come across two samples of jalap containing an appreciably larger quantity of resin than any jalap manipulated twenty-six years ago by a firm which has a most extensive experience with this particular article.

*Bow, E.* J. C. STEAD.

## Answers to Correspondents.

*H. T. W.*—Perhaps Gorham's "Tooth Extraction" (H. K. Lewis) may serve your purpose. See review on page 299 in Journal for October 7 last.

## Notices of Meetings next Week.

WEDNESDAY, JANUARY 17.

*Society of Arts*, at 8 p.m.
"White Lead Substitutes," by A. Laurie.

*Edinburgh Chemists' Assistants' and Apprentices' Association*, at 9.15 p.m.
Communication by W. B. Cowie.
"Notes on Glucose in Syr. Ferri Iod.," by W. Lyon

*Royal Microscopical Society*, at 8 p.m.
Annual Meeting. Address by A. D. Michael (President).

*Imperial Institute*, at 8.30 p.m.
Ladies' Concert.

*Manchester Pharmaceutical Association*, at 8 p.m.
Annual Ball at the Hulme Town Hall.

THURSDAY, JANUARY 18.

*Linnean Society of London*, at 8 p.m.
"On the Origin of the Structural Peculiarities of Climbing Stems by Self-Adaptation, in Response to External Mechanical Forces," by Rev. Geo. Henslow.

*Imperial Institute*, at 8.30 p.m.
"Petroleum in India," by Professor Oldham.

*Chemists' Assistants' Association*, at 8.30 p.m.
"Sponges," by W. Murton Holmes.

*London Institution*, at 6 p.m.
"Some Curiosities of Natural History," by Prof. C. Stewart.

*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
Members' Meeting.

*Midland Pharmaceutical Association.*
Annual Ball at the Edgbaston Assembly Rooms.

*Chemical Society*, at 8 p.m.
"The Molecular Formulæ of some Liquids, as determined by their Molecular Surface Energy," by Professor Ramsay and Miss Emily Aston.
"On Picraconitine," by Professor Dunstan and E. F. Harrison.
"The Action of Heat on Aconitine," by Professor Dunstan and F. H. Carr.
"Further Observations on the Conversion of Aconitine into Isaconitine," by Professor Dunstan and Mr. F. H. Carr.
"The Interaction of Benzylamine and Ethyl Chloracetate," by Drs. Mason and Winder.

SATURDAY, JANUARY 20.

*Pharmaceutical Football Club v.* Tovey's Athletic at Shepherd's Bush, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Dott, Hill, Nagelvoort, Russell, Shepherd, Watkinson.

## CONTRIBUTIONS TO OUR KNOWLEDGE OF THE ACONITE ALKALOIDS.

### PART VIII.—ON PICRACONITINE.*

BY WYNDHAM R. DUNSTAN, M.A., F.R.S, AND E. F. HARRISON.

[*From the Research Laboratory of the Pharmaceutical Society.*]

Through the kindness of Mr. T. B. Groves, of Weymouth, the authors have been enabled to examine some specimens of the salts of picraconitine, an amorphous alkaloid obtained by Mr. T. B. Groves, in the year 1874, from the roots of *Aconitum napellus.* The properties and composition of this substance were investigated by Dr. Alder Wright (*Journ. Chem. Soc.*, 1877, 146; 1878, 332). Its composition was represented by the formula $C_{31}H_{45}NO_{10}$, that of aconitine being $C_{33}H_{43}NO_{12}$. It furnished crystalline salts and an amorphous aurichloride. When heated with alkalies it underwent hydrolysis, yielding benzoic acid and a base, picraconine, which closely resembled aconine, the similar product from aconitine, the hydrolysis being represented by the equation—

$$C_{31}H_{45}NO_{10}+H_2O=C_7H_6O_2+C_{24}H_{41}NO_9.$$

Picraconitine was sparingly soluble in water, but readily in ether. Its salts had an intensely bitter taste, whence the name given to the substance, but they did not produce tingling of the tongue and lips, which is so characteristic of aconitine. Mr. Groves had not previously obtained this alkaloid from other collections of the roots of this plant, and neither he nor Dr. Alder Wright was able to isolate it subsequently.

It has therefore been suggested that it originated from the roots of some other species of aconite, which were mixed in this collection with those of *A. napellus*. In the course of the present investigation of the alkaloids of *A. napellus*, no alkaloid having the composition of "picraconitine" has been obtained. The substance resembles, however, in many of its properties the isomeride of aconitine, isaconitine, whose properties have been described in previous communications. The fact that this isomeride is difficult to purify except by adopting special methods, suggested the view that "picraconitine" might be impure isaconitine.

An examination of Mr. Groves's specimens of "picraconitine nitrate" and "picraconitine muriate" has confirmed this view. The base regenerated from these salts exhibited all the properties of isaconitine, and on converting it into the hydrochloride and purifying this salt, first by crystallisation from hot water and afterwards from a mixture of alcohol and ether, pure isaconitine hydrochloride melting at 217° was obtained. In order to complete the proof the characteristic aurichlor-isaconitine, $C_{33}H_{44}(AuCl_2)NO_{12}$, was prepared from the "picraconitine" salts.

"Picraconitine" can therefore no longer be retained as the name for an alkaloid derived from *A. napellus.*

The present investigation has shown that this plant contains, besides *aconitine*, the non-toxic *isaconitine* and the hydrolytic product *aconine*, a very small quantity of an amorphous alkaloid yielding crystalline salts, which has been named *homisaconitine*, and generally a considerable quantity of a base neither crystallising itself nor furnishing crystalline salts.

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* The substance of a communication made to the Chemical Society, January 18, 1894.

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## CONTRIBUTIONS TO OUR KNOWLEDGE OF THE ACONITE ALKALOIDS.

### PART IX.—THE ACTION OF HEAT ON ACONITINE.*

BY WYNDHAM R. DUNSTAN, M.A., F.R.S., AND F. H. CARR.

[*From the Research Laboratory of the Pharmaceutical Society.*]

The authors find that when aconitine is heated at its melting point (188°-190°) it loses about 10 per cent. of acetic acid, which distils over, leaving behind a new alkaloid, which the authors propose to name *pyraconitine*. The equation representing this decomposition is—

$$\underset{\text{Aconitine.}}{C_{33}H_{45}NO_{12}} = \underset{\text{Acetic Acid.}}{C_2H_4O_2} + \underset{\text{Pyraconitine.}}{C_{31}H_{41}NO_{10}}$$

Pyraconitine is an amorphous varnish, sparingly soluble in water, but readily dissolved by alcohol, chloroform, and ether. It has no action on polarised light, and is not poisonous in small doses. The alkaloid readily dissolves in acids, forming salts, which can be crystallised.

*Pyraconitine hydrobromide*, $C_{31}H_{41}NO_{10}.HBr$, forms prismatic crystals melting at 280° (corr.). The salt is readily soluble in water and alcohol, but is not dissolved by ether. It is best crystallised from a mixture of alcohol and ether. In aqueous solution it is lævo-rotatory $[a]_D = -46°·8$.

*Pyraconitine hydrochloride*, $C_{31}H_{41}NO_{10}.HCl$, crystallises in rosettes from a mixture of alcohol and ether. It melts at 249°.

*Pyraconitine hydriodide*, $C_{31}H_{41}NO_{10}.HI$, also crystallises in rosettes, which become yellow when exposed to air. It melts at 220° 5 (corr.).

The solutions of these salts have a bitter taste, but are not toxic, at all events in small doses.

*Pyraconitine aurichloride*, $C_{31}H_{41}NO_{10}.HAuCl_4$, is thrown down as a pale yellow precipitate when auric chloride is added to a solution of the hydrochloride. No aurichlor derivative could be obtained.

Pyraconitine and its salts readily undergo hydrolysis when heated with dilute acids, or with water in a closed tube. Potash and soda quickly hydrolyse the alkaloid even in the cold, but ammonia does so only very slowly. The sole products of hydrolysis are *benzoic acid* and an alkaloid, which has been named *pyraconine*.

The equation representing the decomposition is—

$$\underset{\text{Pyraconitine.}}{C_{31}H_{41}NO_{10}} + H_2O = \underset{\text{Benzoic Acid.}}{C_7H_6O_2} + \underset{\text{Pyraconine.}}{C_{24}H_{37}NO_9}$$

Pyraconine is an amorphous base, resembling aconine in its properties, but differing from it in several respects. It is soluble in both water and ether. The aqueous solution has a somewhat sweet taste, and is lævo-rotatory $[a]_D = -90°·99$. It combines with acids to form crystalline salts, which are very soluble in water.

*Pyraconine hydrochloride*, $C_{24}H_{37}NO_9.HCl$, crystallises from water in cubes containing $1H_2O$. They melt at 159° (corr.), and are soluble both in alcohol and in water. The aqueous solution is lævo-rotatory $[a]_D = -102°·07$.

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* The substance of a communication made to the Chemical Society, January 18, 1894.

*Pyraconine aurichloride*, $C_{24}H_{37}NO_9,HAuCl_4$, is a pale yellow amorphous precipitate.

The salts of aconitine also furnish pyraconitine, losing acetic acid when heated to about 190°. Isaconitine and aconine, however, do not undergo a similar decomposition. The authors consider it probable that the production of acetic acid from aconitine may serve as the basis of a process for the determination of this alkaloid. Experiments are now in progress with a view to this result.

## CONTRIBUTIONS TO OUR KNOWLEDGE OF THE ACONITE ALKALOIDS.

### PART X.—FURTHER OBSERVATIONS ON THE CONVERSION OF ACONITINE INTO ISACONITINE.*

BY WYNDHAM R. DUNSTAN, M.A., F.R.S., AND F. H. CARR.

[*From the Research Laboratory of the Pharmaceutical Society.*]

In a former communication the authors showed that when certain aconitine salts are heated at 100° in slightly acid solution, they are very slowly changed into the salts of isaconitine. They have since found that this conversion may be effected with great rapidity by heating a neutral aqueous solution in a closed tube at 120°–130° during from two to three hours, when the aconitine salt disappears, often so completely that the solution produces no tingling sensation on the tongue. The isaconitine is separated from the solution, rendered alkaline with ammonia by repeated extraction with ether.

It has also been proved that the production of isaconitine invariably precedes the hydrolysis of aconitine into aconine and benzoic acid, not only when the hydrolysis is effected by acid, as was pointed out in a previous paper, but also, as has now been found, when water alone is used as the hydrolytic agent. In previous experiments the formation of isaconitine during the alkaline hydrolysis of aconitine could not be proved, owing to the rapidity with which aconine is produced. If, however, a considerable excess of aqueous soda be added to a solution of an aconitine salt, and the precipitated alkaloid is allowed to stand in the cold in contact with the alkali until some of the alkaloid has dissolved, extraction with ether separates a notable quantity of isaconitine, as well as the unchanged aconitine. It therefore appears that the non-toxic aconine is really the product of the hydrolysis of the non-toxic isaconitine, into which the aconitine first changes.

The observations recorded in the foregoing paper, which prove that aconitine salts, as well as the alkaloid itself, lose acetic acid when they are heated, led the authors to look for the production of this acid when these salts are heated in aqueous solution. It has been found that some acetic acid is formed under these circumstances, and also when these salts or the free alkaloid are hydrolysed. They are at present engaged in investigating the origin and amount of the acetic acid produced under various conditions; and also in determining whether pyraconitine is formed in corresponding quantity, or whether aconitine may not be an acetyl derivative which loses its acetyl group on hydrolysis. If the latter view should prove to be correct, the nomenclature and formulæ of aconitine derivatives will need entire revision.

## NOTE ON MALAYAN ARROW POISONS.

BY W. T. THISELTON DYER, C.M.G., C.I.E., F.R.S.,

*Director, Royal Gardens, Kew.*

Dr. Stockman seems to be unacquainted with the important paper on these poisons by Mr. Leonard Wray, the Curator of the Perak Government Museum, which is published in the *Kew Bulletin* for 1891 (pp. 259–261). It is, I believe, accessible in the Library of the Pharmaceutical Society.

The specimens of the plants used in the preparation of the poisons were examined by Dr. Stapf, Assistant for India in the Herbarium of the Royal Gardens. They were insufficient for absolute identification. Some light was, however, thrown upon them.

*Lampong* was referred conjecturally to *Strychnos Maingayi*, Clarke. *Ipoh Aker* was determined to be a species of *Strychnos* "closely allied to *S. Maingayi*, and probably only a different state of it." *Prual* was a Rubiaceous plant, "possibly a *Lasianthus* or *Urophyllum*."

## GRANULAR EFFERVESCENT SALTS.*

BY AUGUSTUS BRADLEY.

I propose in this paper to relate the results of a few experiments with an apparatus of my construction, also giving methods and formulas whereby the retail pharmacist can prepare his own granular effervescent preparations, and not be dependent upon the wholesale manufacturer as heretofore.

These preparations are made by causing the mixture of powdered ingredients, consisting of sodium bicarbonate, tartaric or citric acid or both, and the medicament, to become sufficiently moistened, and when this is in a pasty condition, rubbed through a coarse sieve, and dried, granules are produced. Each article should be separately powdered and dried before mixing, the citric acid to be added last and rubbed in quickly.

The drying apparatus should previously be heated for the reception of the moist granules. The proper pasty consistence of the mixture is only ascertained through practice, some mixtures requiring more of the moistening agent than others.

The selection of a cheap moistening agent seems to me to be an item of great importance, especially when large quantities are to be made. Samples were prepared with ether, amylic alcohol, steam, syrup, carbon disulphide, etc., but with each too great a loss of carbon dioxide resulted during manipulation to encourage their use. Water in some form being the prime cause of this loss, I concluded that if a liquid containing no water at all be used, granules can be made without any loss of gas. I was aware that absolute alcohol contained practically no water, but also that if it answered from this standpoint, its expensiveness would discourage its use. However, a small quantity of a mixture was tried, but owing to the hygroscopic properties of the alcohol, the experiment proved a failure. In a few minutes after the granules had been removed to be dried, decomposition took place, resulting in an adherence and puffing up of the granules, showing too great a loss of gas. Purified benzin was next tried, but owing to the disagreeable taste and odour, and the ease with which the dried product was crushed, it was abandoned. Benzin with different percentages of absolute alcohol likewise yielded negative results.

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* The substance of a communication made to the Chemical Society, January 18, 1894.

* Abstract, in the *Western Druggist*, from the Proceedings of the North Carolina Pharmaceutical Association.

After numerous experiments, I found 95 per cent. (by vol.) alcohol, as recommended by the National Formulary, to be the best agent for general use.

I use four copper wire sieves, Nos. 6, 20, 40, and 60; No. 6 to pass the pasty mass through upon the glass shelf; No. 20 to separate the dried granules from the dust, though some manufacturers, to prevent any loss, do not separate it. Nos. 40 and 60 are used for thoroughly mixing the different ingredients. I like the copper wire sieves best, owing to their being less liable to be attacked by corrosive agents.

The temperature of the drying apparatus, with but few exceptions, should always be constant, taking care not to allow it to exceed 158° F., for fear of converting the sodium bicarbonate into the carbonate, through the loss of carbon dioxide, and also the formation of caramel in those preparations containing sugar with tartaric acid.

The loss of weight encountered in drying the following articles as found in commerce, are: Citric acid 8 to 10 per cent.; sodium bicarbonate, 2 to 3 per cent.; tartaric acid, $\frac{1}{10}$ per cent.

The use of tartaric acid alone, as recommended by the National Formulary, leaves the granules too soft; an addition of citric acid will give them firmness, and render their taste more acceptable to the majority of people.

There is no class of preparations that requires such special care as these. The absence of moisture is absolutely essential, therefore the bottles should be thoroughly dried, and hermetically sealed immediately after being filled. Those composed of iron, pepsin, and their compounds, should be stored in amber or blue glass bottles.

I submit a few formulas which I have compiled and am using, most of which, in the course of manufacture, require some special precautions to be taken. These will, however, be evident to the operator upon his first attempt.

### EFFERVESCENT CAFFEINE CITRATE.

| | |
|---|---|
| Caffeine citrate | gr. 20 |
| Sodium bicarbonate | gr. 600 |
| Citric acid | gr. 300 |
| Tartaric acid | gr. 240 |
| Sugar, powdered | gr. 620 |

### EFFERVESCENT CAFFEINE CITRATE AND PHENACETIN.

| | |
|---|---|
| Caffeine citrate | gr. 20 |
| Phenacetin | gr. 100 |
| Sodium bicarbonate | gr. 600 |
| Citric acid | gr. 300 |
| Tartaric acid | gr. 240 |
| Sugar, powdered | gr. 620 |

### EFFERVESCENT POTASSIUM BROMIDE.

| | |
|---|---|
| Potassium bromide | tr. oz. ½ |
| Sodium bicarbonate | tr. oz. 3¾ |
| Tartaric acid | tr. oz. 1¼ |
| Citric acid | tr. oz. 2 |

### EFFERVESCENT CAFFEINE CITRATE AND POTASSIUM BROMIDE.

| | |
|---|---|
| Caffeine citrate | gr. 50 |
| Potassium bromide | gr. 240 |
| Sodium bicarbonate | tr. oz. 3¾ |
| Tartaric acid | tr. oz. 1¼ |
| Citric acid | tr. oz. 2 |

### EFFERVESCENT MAGNESIUM SULPHATE.

| | |
|---|---|
| Magnesium sulphate, dried | gr. 400 |
| Tartaric acid | gr. 300 |
| Citric acid | gr. 240 |
| Sugar, powdered | gr. 460 |
| Sodium bicarbonate | gr. 600 |

This is practically identical with the granular effervescent magnesium citrate on the market.

### EFFERVESCENT VICHY SALT.

| | |
|---|---|
| Potassium bicarbonate | gr. 45 |
| Sodium chloride | gr. 90 |
| Magnesium sulphate | gr. 45 |
| Sodium bicarbonate | tr. oz. 5 |
| Tartaric acid | tr. oz 1½ |
| Citric acid | tr. oz 2 |

### EFFERVESCENT PEPSIN.

| | |
|---|---|
| Pure powdered pepsin | gr. 50 |
| Citric acid | tr. gr. 1¾ |
| Tartaric acid | tr. gr. 1½ |
| Sugar, powdered | tr. gr. ½ |
| Sodium bicarbonate | tr. gr. 3¾ |

### EFFERVESCENT PEPSIN AND BISMUTH.

| | |
|---|---|
| Pure pepsin, powdered | gr. 50 |
| Bismuth and ammonium citrate | gr. 50 |
| Citric acid | tr. oz. 1¾ |
| Tartaric acid | tr. oz. 1½ |
| Sugar, powdered | tr. oz. ½ |
| Sodium bicarbonate | tr. oz 3¾ |

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## VANILLA IN RÉUNION.

Réunion is the largest vanilla producing country, nearly 96 tons, valued at £115,200, having been exported in 1892. Its quality is much appreciated in Europe, that from Mexico alone fetching a higher figure. The Seychelles vanilla is recognised as much inferior. It is exported mainly by the *Messageries Maritimes* steamers to Marseilles and Havre at a freight of nearly £10 a ton. It is mostly bound for the French market: Paris, Bordeaux, and Nantes; but a considerable quantity goes to Hamburg for German, Austrian, Danish, and Norwegian use. The London market is supplied mainly from the Seychelles and Mauritius, and receives very little vanilla from Réunion, even *via* France. This graceful creeper, hanging in heavy snake-like folds round the trunk of its supporter, grows in shady places underneath trees, in any soil which is kept fairly moist by rains, and it has the advantage of being produced in places fit for no other purpose, such as a forest of "filaos" (*Casuarina equisetifolia*). Perhaps few other products have experienced such wonderful fluctuations in value, the price varying from 300 fr. to 30 fr. per kilo. The vanilla pod loses about three-quarters of its weight in preparation. It is either plunged in boiling water or heated in ovens. It is then placed in the sun, carefully covered over to prevent undue heating, after which it is dried under cover and carefully watched for the slightest trace of moisture. After three months' treatment it is carefully sorted to length and quality, and finally packed for export in small tin cases.—*Consular Report.*

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## THE OIL-PRODUCING PLANTS OF FORMOSA.

The following particulars of the oil-producing plants found in Formosa are extracted from a special report on the resources and trade of that island prepared by Mr. Alex. Hosie, late Acting British Consul at Tamsui, and published by the Foreign Office as Commercial No. 11 (1893):—

*Oil-Producing Plants.*—Since the introduction of kerosene oil into China, the demand for native lighting-oils has been on the decline, but for cooking purposes some of these oils are produced in large quantities. Oil-yielding seeds are likewise exported, to a limited extent, to foreign countries, where the oil is extracted and used to adulterate more valuable oils.

Of the seventeen oil-producing plants cultivated in China eight grow in Formosa. They are:—

1. *Dolichos Soja, L.* (?).—More oil is extracted from this bean than from any one of the other oil-yielding plants of China. The two kinds of bean treated for oil are small in size and oval in shape, one having a whitish yellow epidermis and interior, the other being green throughout. They are probably sub-varieties of the *soja* bean. The process of extraction is worthy of description.

The first thing that strikes the eye of a visitor to a bean-oil factory is the enormous stone wheel which is used to crush the beans. It is of dressed granite, about 10 feet in diameter and 2½ feet thick at the axis, gradually contracting to a foot at the rim. This wheel, which is of enormous weight, revolves in a well 30 to 36 inches broad, paved with stone, and bounded on each side by a low wall of concrete some 3 feet high. The massive wooden axle on which the wheel revolves has its opposite end firmly fixed in a huge beam, which rises vertically from the centre of the circle formed by the inner wall of the well, and which revolves with the wheel. Behind the wheel, and supported by a plank fixed on and near the opposite end of the axle, is a wooden framework, which just sweeps the floor of the well. The front of the framework has a metal share like a plough, and affixed to the rear is a small square of wood inclined to the inner wall of the well, with a loop of rope or leather nailed to it. The beans to be crushed are heaped in the well against the inner wall. Two mules, blindfolded, are harnessed to the wheel, one in front, the other behind, and walk outside the outer wall. At the first revolution nothing is crushed, but the loop at the end of the framework drags the beans on to the floor of the well, and at the second revolution these are crushed and swept towards the outer wall by the share, making way for a fresh supply of beans dragged on by the loop arrangement at each revolution. The beans are flattened into thin round wafers, and are crushed a second time before they are ready for further manipulation. After the second crushing, bean wafers sufficient to make a cake 4 inches thick and 2 feet in diameter when compressed are put in a square piece of sacking, and placed on a wooden grating above a cauldron of boiling water. In a few minutes they are rendered quite soft by the steam which passes up through the grating to the sacking and its contents. During the process of steaming, another workman has been arranging a series of soft straw brooms, which are also steamed, so as to form the bottom of a couple of narrow metal bands surmounted by a wooden casing, over which the long tips of the straw brooms project. Into this the steamed beans are poured and trampled down by foot till the mass is quite hard. The projecting straw tips are then brought over the top of the beans by foot, and trampled down so as to form a covering. The wooden casing is removed, and the metal bands arranged a short distance apart near the top and bottom of the cake respectively. The whole is then put into a primitive wooden press, and subjected to considerable pressure by the driving in of successive wedges. The oil is expressed and drains into an underground tank, the top of which is on a level with the stone-guttered slab on which the lowest cake rests, for half-a-dozen cakes, one above the other, may be undergoing pressure in the same press at the same time. When all the oil has exuded from the cakes they are taken from the press, the metal bands and straw casings are removed, and, after being left to dry for a time, they are ready to be shipped to other parts of China for manure. The beans yield about 10 per cent. weight of oil, and the cakes, when removed from the press, weigh some 64 lbs., and are worth about 2*s.* 9*d.* each. They constitute a very valuable manure, and are carefully macerated before being applied to the soil.

To show the commercial value of this industry, I may mention that 60,000 tons of bean cakes were exported from Chefoo during 1890. Nor is Chefoo the principal exporter. Newchwang sent out over 156,000 tons in the same year. In Formosa these beans are grown, and the oil is extracted in the above manner, but only in quantities sufficient to meet local requirements. The refuse cakes are not exported. The oil is used for both cooking and lighting purposes.

2. *Brassica Chinensis*, L.—Rape is usually a winter crop in China. Towards the end of October the seeds are planted about a foot apart in beds; in March the plants are in full flower, and in early June the crop of seeds is harvested. This refers to Mid-China, where the temperature is mild and the frost is not so severe as to retard sowing till after winter. It is more widely cultivated in China than any of the other oil-yielding plants. The seeds are treated much in the same way as beans, being crushed, steamed, and subjected to pressure. Like the preceding, rape-oil is used for lighting as well as for cooking.

3. *Sesamum indicum et orientale*, D.C.—Both the white- and black-seeded varieties of sesame are cultivated in China, and from Formosa there is a very considerable export of seeds which find their way to

France, where sesame is largely used to adulterate olive oil. It is a summer crop; the seed is sown in May, usually in rows with other crops, such as cotton on the mainland; the plant blossoms in July, and the harvest takes place in September and October. Sesame is essentially a food oil. Refuse seed-cake is much used in Formosa for adulterating opium.

4. *Arachis hypogaa*, L.—The ground-nut, a native of Africa, is extensively cultivated in China, not only for the food which the nuts supply, but also for the oil which they contain. Although the Chinese have not yet discovered a good practical method of removing the shells before pressing, yet the oil, necessarily impure on that account, is highly appreciated as a food, as well as a lamp-oil. To obtain the oil, the nuts are roasted, rolled, winnowed—to get rid of the shells—steamed and pressed. The plant prefers a sandy soil, such as is found in the neighbourhood of Chefoo, but it appears to be equally at home in Western China and in Formosa. I may say, without fear of contradiction, that these nuts will be found on every roadside stall in China.

5. *Stillingia sebifera*, S. and N.—From the seeds of the vegetable tallow tree, both tallow and oil are produced. They are used for lighting purposes only, and as the method of extraction is ingenious, a short description thereof may be of some interest. When the fruit is ripe, the dark brown protecting covering which encircles each seed opens and falls to the ground, leaving exposed bunches of greyish-white berries, which resemble coffee-beans in appearance and size. These are collected by hand, steamed, and thereafter pounded in an ordinary rice trough. By pounding, the soft mealy mesocarp is partially separated from the kernels. The whole is then placed in a bamboo sieve, the meshes of which are just large enough to allow the mealy matter to be scrubbed through, and small enough to keep back the kernels, which are hard, black, and about the size of peas. From the mealy substance the tallow is expressed in primitive wooden presses. The oil is derived from the kernels in the following manner. They are dried in the sun and passed between two mill-stones held at such a distance apart, by means of a bamboo pivot, as to crush the hard shells of the kernels without injuring the white interiors. The whole is then passed through a winnower, which separates the broken shells from the solid matter. The latter is thereafter placed in a deep iron pan over a fire, the crushed oily shells making an excellent fuel, and roasted till it begins to assume a brownish colour, the process being accompanied by continual stirring to prevent burning. It is then crushed by a huge stone roller in a circular stone well, steamed, made into cakes, like cheeses, with bamboo and straw casings, and passed through the wooden press. The resultant is a good lighting oil of a brownish-yellow colour.

I have previously alluded to the remarkable ruddy tint which the foliage of this tree assumes in autumn, a tint which lights up the landscape wherever the tree grows, and forces its beauty on the beholder. Although it grows wild and uncared for in North Formosa, no use whatever is, so far as I can ascertain, made of its fruit. There, too, the berries appeared to me to be inferior and much smaller than those produced by the cultivated and well-tended trees on the mainland. But the secret no doubt is that, whereas in Formosa the tree is utterly neglected, in the great centres of tallow and oil manufacture in China it is grafted, and consequently yields superior fruit.

6. *Camellia Thea*, Link.—In all the tea-growing districts throughout China, the seeds of the tea-plant not required for raising new bushes are collected and treated for their oil, which is employed for both food and lighting.

7. *Cinnamomum Camphora*, N. and E.—Although the camphor laurel is found in many of the provinces of China, where it is highly valued on account of its wood, yet Formosa is the only province in which camphor is manufactured. I shall have occasion to deal hereafter with this industry, and need only mention in this place that when the camphor is being distilled from the chips of camphor-wood an essential oil exudes and drops into the boiling water underneath. This, as well as the liquid which exudes from the camphor when awaiting shipment, is collected and exported under the name of camphor oil. It is used for chemical purposes.

8. *Ricinus sp.*—The castor-oil plant grows wild throughout Formosa; but in the north of the island oil is not extracted from the seed, nor is any use whatever made of the plant. In the south a little oil is extracted for purely local uses, but no attempt is made to cultivate the plant. This species, which has green stems and leaves, does not attain the height of *Ricinus communis*, which is distinguished by its purple stems, branches, and leaves. The latter, grown from imported seed, may be seen as an ornamental shrub in gardens near Tamsui.

I have not included *Diospyros Kaki*, L. f., which grows in Formosa as well as on the mainland, among oil-producing plants, for the juice of its fruit should be classed as varnish and not as oil.—*Board of Trade Journal.*

## THE PREPARATION OF AROMATIC WATERS.

BY M. A. MINER.

In the preparation of aromatic waters the new U.S. Pharmacopœia directs the trituration of two cubic-centimetres of volatile oil with four grammes of precipitated calcium phosphate and the gradual addition of distilled water, etc.

Calcium phosphate and volatile oil triturated together in the above proportions produce a pasty mass, a condition not favourable for the solvent action of the water.

The calcium phosphate should be present in such excess that when triturated with the oil it will form with the latter a mobile powder. Experimenting with various proportions, it was found that a powder of that character was secured when twenty grammes of calcium phosphate were triturated with two cubic-centimetres of volatile oil. Such a powder must contain the oil in minute division. It mixes easily with the water on trituration, without evident separation of oily particles, and furnishes a satisfactory product.

The recommendation of Dr. Oldberg, that the mixture, before filtration, be shaken at frequent intervals for a time, would insure greater certainty of saturation.—*Apothecary.*

## THE TRAINING OF THE SHOP.

BY WILLIAM B. THOMPSON.

Professor Oscar Oldberg has contributed to the columns of the *Apothecary* for September quite a lengthy paper on "Compulsory Pharmaceutical Education in America" (see *Pharm. Journ.*, *ante*, p. 501).

The arguments seem to be chiefly directed against the possibility of an adequate pharmaceutical education being attainable in the shops, *ergo* the curriculum of the college is the means by which a thoroughly practical knowledge of the art may be secured. This is a view from one standpoint only. Five of the leading teaching institutions of the country have been in existence on an average forty-seven years, and now we are told that there are comparatively no educated pharmacists in the shops competent to instruct apprentices. Is this to be accepted as the result of forty-seven years of systematic collegiate instruction? If so, it is not a flattering testimony, certainly, to the efficiency of that system.

By common assent among pharmacists no single cause has tended more to lower the status of pharmacy in a scientific aspect than the inseparable business rivalry of the colleges. Beyond the number actually needed and already established to meet the gradual growth and demand of the time, these institutions became enterprises with solely pecuniary interests, and these interests became paramount to every other consideration. Then it was that the true sentiment in regard to pharmaceutical education found expression in a resolution passed by the American Pharmaceutical Association in 1871, declaring "That colleges of pharmacy should be controlled by pharmacists," and that "a practical experience" in the shop should be a *sine quâ non* among the requirements for graduation. The forcible truth of these assertions yet remains, and it has been repeatedly emphasised by demanding that this term of "practical experience" shall not be less than four years. Colleges of pharmacy had begun to multiply as business ventures, because pharmacy was growing, and the country was extending. One notable institution, in order to secure a share of the patronage of the older schools, declared its purpose to open a short cut into the realm of pharmaceutical practice and science, and preferred to make better qualified pharmacists under its newer methods of instruction than the tutelage of the shop and the then existing institutions could possibly supply. This was a tempting offer to the novice, but it received the severe disapproval of the prominent representatives of the pharmaceutical profession. In addition to this profusion of promise it was even claimed that under its thorough methods it was not deemed an essential requirement that the student, either before or during his terms of tuition, should even see the interior of a drug store! This plan substituted a limited term months of necessarily disjointed theoretical instruction, and of practice, for a four years' service of continuous exercise in the manipulations of an art which the limits of an average life, with uninterrupted labour and study, cannot compass! As reasonably might it be expected that an artisan could acquire a knowledge of his trade by studying models of tools, and simply inspecting the material of which he should construct his work. Need it cause surprise, then, to reflect that at that time, and subsequently, the majority of the States sought the enactment of pharmacy laws, and created boards of pharmacy to protect the trade against the tide of incompetency which was pouring into every accessible quarter.

To the earnest student, no better illustration can be presented of the invaluable resources of shop-training for acquiring an intimate knowledge of the practice of pharmacy and of the cognate science, than is found in the histories of Scheele in the old world, and of Procter in the new.—*American Druggist.*

## ON THE ESSENTIAL OIL OF LEMON.

BY R. S. LADELL.

Many plants contain oily substances to which they owe their peculiar odour, and these can be obtained from them by distillation with steam. Many of the so-called essential oils contain terpenes or hydrocarbons represented by the formula $C_{10}H_{16}$; and it has been stated that the terpenes are often the chief constituents of the essential oils, as in the case of lemon and orange oils, etc. But it should not be forgotten that the oils of lemon and orange, as well as other essential oils, may be obtained entirely devoid of terpenes.

Geissler (*Pharmaceutische Centralhalle*, 1881) has described the terpeneless oil of lemon, and shown that it excels the commercial oil of lemon in odour, flavour, stability, solubility, and strength. True terpeneless oil of lemon, which is the subject of this note, is an oxygenated liquid of constant boiling-point, specific gravity, and composition. Commercial oil of lemon has a specific gravity of 0·860 at 15° C.; the terpene known as citrene has a specific gravity of 0·850; whilst the ordinary terpeneless oil of lemon (*i.e.*, freed from citrene) has a specific gravity of 0·900. The ordinary terpeneless oil of lemon is really a mixture of several oxygenated compounds, but by fractional distillation a liquid has been obtained which has a constant composition, an exceedingly strong odour of lemon oil, a specific gravity of 0·962, a boiling-point of 206° C., and a specific rotatory power of $[\alpha]_D = +6{\cdot}42°$. The following results were obtained on submitting this liquid to analysis:—

0·5313 grm. gave 1·5135 grm. of $CO_2$ and 0·5617 grm. of $H_2O$.

| | Found. | Calculated for $C_{10}H_{18}O$. |
|---|---|---|
| Carbon ............ | 77·6 | 77·92 |
| Hydrogen......... | 11·8 | 11·68 |
| Oxygen ............ | — | 10·40 |

The above figures correspond with the empirical formula $C_{10}H_{18}O$ for the true oil of lemon—that is to say, for the terpeneless oil of lemon of constant composition, which appears to be an isomer of borneol.—*Chemical News.*

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

SATURDAY, JANUARY 20, 1894.

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## POISONING BY MISADVENTURE.

VARIOUS references to the subject of poisoning by misadventure which have recently appeared may be taken as indicating a probability that there may be a renewal of the conflict between those who believe in the efficacy of regulations for the observance of mechanical safeguards, and those who hold that such measures are far less to be trusted than the educated intelligence of the persons authorised to deal in poisons. But if it should happen that this question should again be raised, candid inquirers will not fail to recognise the fact that within the past twenty years great progress has been made towards better provision for public safety in regard to poisons. Within the ranks of registered chemists it has become a general rule to give effect to the recommendations as to the keeping, dispensing, and selling of poisons, which were agreed upon at a general meeting of the Society in 1871. The particular conditions under which the chemist's business is carried on may, in certain instances, require a different mode of procedure from that which is suitable in other instances; but it may be confidently asserted that a desire to provide for the main object of the Pharmacy Act has actuated all members of the body. While that has been the case with registered chemists generally, in regard to the conduct of their ordinary business, advances have also been made towards suitable regulation of the trade in articles of a more or less anomalous character, which have long escaped control in the same way that the supply of official preparations and recognised medicines is necessarily regulated. The action recently taken by the Treasury Department in regard to proprietary medicines has had the result of establishing the fact that articles of this nature containing scheduled poisons are as fully subject to the provisions of the Pharmacy Act as ordinary medicinal preparations. It may happen that some time will elapse before the trade in such articles is brought into full conformity with the spirit of the Act, and that endeavours to resist its application will have to be overcome; but, however that may be, there is now a more complete recognition of the principle that medicinal preparations of possibly dangerous character should not be dealt in as a matter of ordinary trade. It now rests with the authorities empowered to administer and construe the Act in particular instances, to apply that principle so as to make the object of the Legislature as far as possible an accomplished fact.

But after all that may be done in that way it will perhaps be unreasonable to expect that poisoning by misadventure will be entirely prevented. Recent occurrences of this kind furnish evidence that the most elaborate precautions are unavailing in some instances. The great difficulty to be overcome is the negligence of individuals to observe the precautions which are taken for their protection. This is shown by the accidents occurring from administration of liniments by mistake even when the bottles containing them are distinguishable by touch from ordinary medicine bottles. Various suggestions have been made as to the particular mode in which the distinction should be made more palpable than in the blue ribbed bottle now in general use. But unless the use of such distinctive bottles for other purposes than to contain poison were prohibited, the value of the distinction would be considerably reduced. There is indeed good reason for believing that a distinctive mark which can be removed would be much more effectual than a specially made poison bottle. A device of this kind is used in some instances, in the shape of a sandpaper label. Mr. THONGER, of Edgbaston, has forwarded some labels of this kind which he has been in the habit of using, and has found serviceable. A still more effectual contrivance would be a closely fitting sheath, with pointed projections, which would cover the whole of the bottle. But none of these contrivances would be equal to a careful reading of the label and directions. It is to the neglect of this essential requisite that most of the accidents are due, and the necessity for caution in this respect cannot be too strongly impressed upon the minds of everyone.

In many of the newspaper references to this subject the important influence of the fact to which we have just referred has been entirely overlooked, and it has been assumed that there is some grave defect in the present system of supplying dangerous medicinal preparations which calls for prompt and stringent measures as a remedy. This view is scarcely consistent with facts, and it may be pointed out that accidents arising from mistakes in dispensing medicines have been of extremely rare occurrence, so far as chemists are concerned. That circumstance testifies to the care exercised in the execution of such work, and it is the more significant when it is remembered that nowadays the chemist has to deal with such a host of potent materials. So far as the chemists' work is concerned, it may be reasonably inferred that there is little reason for apprehension, and it may also be expected that they would willingly assist in carrying out any well devised plan for preventing the occurrence of accidents after medicines leave their hands.

### CALENDAR FOR 1894.

The edition of the Calendar of the Pharmaceutical Society for the current year has been published this week, and copies may now be obtained on application to the Secretary, Mr. Richard Bremridge, 17, Bloomsbury Square, W.C. It will be found that the official corrections of the lists of Councillors, Officers, Members, Associates, Students, etc., have been supplemented by a number of other useful alterations in the book. Students will no doubt regard the insertion of the questions set in 1893 for the Major and First Examinations, and the Jacob Bell and Pereira competitions, as imparting a special interest to the publication. Of great practical value also are the additions to, or emendations of, the various Acts of Parliament affecting chemists and druggists more or less directly. Summaries are given of General Orders of the Board of Inland Revenue, dealing with the use of stills, manufacture and sale of wine essences, and payment of drawback on exported tinctures, flavouring essences, and perfumed spirits, very full information being given regarding the last mentioned subject. By deleting the scales of medicines and medical stores, under the Merchant Shipping and Passengers' Acts, and substituting information where these scales may be obtained, a considerable amount of space has been economised, and, since minor alterations in these scales are of frequent occurrence, the omission should cause no inconvenience to persons interested in the matter. The provisions and bearing of the Explosives Act have been rendered more comprehensible by the addition of the official scheme of classification of explosives and the regulations affecting the keeping of the same for private use. As bearing upon a question that is frequently raised, it may be stated that an extract quoted from an Order of Council, referring to picric acid, picrates, etc., appears to indicate, when read in connection with the Explosives Act, that picric acid in small quantities, as stocked and sold by chemists and druggists, would not necessarily be regarded as an explosive within the meaning of the Act. Finally, some memoranda issued by the Standards Department with reference to the verification of apothecaries' measures by the local inspectors of weights and measures are inserted. The whole of the information in the Calendar has, of course, a special value to chemists and druggists, many of whom would doubtless spare themselves considerable inconvenience at times by occasional reference to its pages, and the present edition may be recommended as being rather more fully up to date than any of its predecessors.

### ARSENICAL GLYCERIN.

A report presented to the local authorities of Leeds by Mr. Fairley, the public analyst, states that out of eight samples of glycerin recently analysed by him, five were found to contain appreciable quantities of arsenic. The presence of arsenic in glycerin attracted considerable attention some short time ago, and manufacturers of this article took pains to show that provision was made for avoiding this contamination, but from Mr. Fairley's report it appears that this has not been effectually accomplished. It is therefore desirable that chemists should take steps for ascertaining the purity of their glycerin and its freedom from such an objectionable contamination as arsenic.

### THE CHEMISTS' BALL.

We have much pleasure in recording the fact that the annual festive gathering of chemists and their friends has again taken place, with the same marked success which has been customary in previous years. The ball was held, as usual, at the Portman Rooms, and was well attended by youthful lovers of dancing, with the result of affording general satisfaction. At the supper the chair was occupied by Mr. Michael Carteighe, who proposed the usual toast, which was heartily responded to. Great credit is due to Mr. A. J. Phillips, who acted as steward on the occasion, for the admirable manner in which all the arrangements of the ball were carried out.

### EVENING MEETING IN EDINBURGH.

An evening meeting in Edinburgh of the Pharmaceutical Society will be held at 36, York Place, on Wednesday next, January 24, at 8.30. The chair will be taken by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch. Notes on "A Preparation of Iron," "The Standard Temperature for Specific Gravity," and "Chloroform," will be communicated by Mr. D. B. Dott, and Dr. Gordon Sharp will contribute a paper on "Papain Digestion; with notes on Papain." Recent additions to the Museum will form the subject of notes by Mr. J. Rutherford Hill, Assistant Secretary of the Society.

### BREACH OF THE PHARMACY ACT AT PAISLEY.

At the Paisley Sheriff Court on Thursday, before Sheriff Cowan, the Pharmaceutical Society sued Charles Maitland Christie—manager for "The Medical Halls, Limited," a company of unregistered persons trading as chemists and druggists—for a penalty incurred by the sale of morphine and chloroform, contained in a bottle of chlorodyne, on Monday, September 11 last. Christie pleaded guilty, and was fined fifty shillings and costs.

# Transactions of the Pharmaceutical Society.

## DONATIONS.

The twenty-four botanical micro-slides presented to the Society's Museum in London by Mr. E. H. Farr, of Uckfield, as reported last week (see p. 573), are as follows:—

Pinnule of *Polypodium* with sporangia.
Pinnule of *Lastræa* with sporangia.
Prothallium of fern.
*Hypnum*, capsule and sporogonium.
*Mnium*, leaves.
*Mnium*, antheridia and paraphyses.
Protonema of moss.
Protonema of scalemoss.
Spores and elaters of scalemoss.
*Metzgeria furcata*, fruiting fronds.
*Radula complanata*, fruiting fronds.
*Frullania dilatata*, fruiting fronds.
*Frullania dilatata*, after the escape of the spores.
*Trichocolea tomentella*, frond.
*Jungermannia connivens*, gemmæ.
Teleutospores of *Aregma bulbosum* (fungi).
Favellæ of *Ceramium rubrum* (algæ).
Favellæ of *Spyridia filamentosa*.
Tetraspores of *Ceramium decurrens*.
*Vaucheria*, oogonia and antheridia.
*Nitella*, antheridia and oogonia or nucules.

The twenty-four slides presented by Mr. Edwin Terry, of London, are as follows:—

*Euphorbia splendens*, showing laticiferous vessels.
*Pteris aquilina*, showing scalariform vessels.
Rhubarb, showing spiral vessels.
Palm, showing dotted vessels.
Lime tree, showing annual rings.
*Fritillaria imperialis*, showing stomata.
Lime tree, showing dicotyledonous structure.
Palm, showing monocotyledonous structure.
*Osmunda regalis*, showing acotyledonous structure.
*Ficus elastica*, showing cystoliths.
Virginian creeper, transverse section of stem.
Liquorice, transverse section of root.
*Tacsonia*, transverse section of leaf.
Lily, transverse section of flower bud.
Tous les mois starch.
Bermuda arrowroot.
St. Vincent arrowroot.
Natal arrowroot.
Potato starch.
Wheat starch.
Barley starch.
Oat starch.
Rye starch.
Maize starch.
Pea starch.
Sago starch.

*Donation to the Library in London (omitted last week)*—

**Mons. J. M. Ricardou:**
Contribution à l'étude des asclépiadacées, 1893.

## EXAMINATIONS IN EDINBURGH.

*January*, 1894.

Present—Messrs. Boa, Fraser, Gibson, Jack, Maben, Nesbit, and Sutherland.

Professor Sir Douglas Maclagan attended on behalf of the Privy Council.

### MAJOR EXAMINATION.

*Three* candidates were examined. *Two* failed. The undermentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

| | |
|---|---|
| McClumpha, Robert | Newcastle-on-Tyne. |

### MINOR EXAMINATION.

*Ninety-seven* candidates were examined. *Fifty-seven* failed. The undermentioned *forty* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Archer, Geo. Banks Walker | Portobello. |
| Black, John | Aberdeen. |
| Browell, John James | Sheffield. |
| Brown, Robert Hinde | Sunderland. |
| Brunton, William David | Markinch. |
| Cameron, Alexander | Montrose. |
| Chorley, Cleasby | Kendal. |
| Clemitson, Joseph William | Bishop Auckland. |
| Cole, William Henry | Congleton. |
| Cowper, Colin Campbell | Montrose. |
| Dixon, Rowland | Sheffield. |
| Ferry, Robert Bailey | Hartlepool. |
| Glendinning, James Colman | Leeds. |
| Glover, John | St. Helens. |
| Harrold, William Malcolm | Forres. |
| Herald, Walter Ogilvie | Godley. |
| Herd, Thomas Smith | Stockton-on-Tees. |
| Highfield, Henry | Darnall. |
| Holt, Robert Dickinson | Bowdon. |
| King, James | Kilmalcolm. |
| Langbourne, Walter Charles | Whitby. |
| McCowan, John | Edinburgh. |
| Macfarlane, Thomas | Glasgow. |
| Medley, Fred | Barnsley. |
| Mollison, William Whyte | Aberdeen. |
| Portlock, Francis | Wotton-under-Edge. |
| Roberts, Robert Randall | Chester. |
| Roberts, Thomas William | Holyhead. |
| Robinson, Albert | Manchester. |
| Robson, William Robert L. | Choppington. |
| Scott, Thomas | Edinburgh. |
| Seath, John Alexander | Dunfermline. |
| Sinclair, George | St. Andrews. |
| Smith, Thomas | Hull. |
| Stones, Arthur John | Rotherham. |
| Taylor, George | Ellon. |
| Thackrey, Frank | Pateley Bridge. |
| Thexton, George William | Kendal. |
| Tod, James Arnold | Edinburgh. |
| Wood, Robert | Milton Bridge. |

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

At the meeting of this Association, held on Thursday, January 11, the chair was taken by Mr. E. Brooke, Vice-President, and the following paper was read:—

### TOBACCOS.

BY H. B. COX.

*History.*

It has been said that the name tobacco was given to the plant by the Spaniards, because it was first observed by them at Tabasco or Tabaco, a province of Yucatan, in Mexico. Others derive the name from the "tabac," an instrument used by the natives of America in smoking this herb.

The use of tobacco for smoking and chewing purposes is supposed to have been commenced by the North American Indians at a very early period, so early, in fact, that nobody seems to have any idea as to when that period was. It is said that the Spaniards became acquainted with tobacco when they landed in Cuba in 1492, and on their return introduced it into Europe, strongly recommending it for its valuable medicinal properties, about which they probably knew nothing at all.

The custom of inhaling the smoke was learnt from the Indians, and by the end of the 16th century had become generally known throughout Spain and Portugal, whence it passed into the rest of Europe, and into Turkey, Egypt, and India, although severely opposed and forbidden both by the Christian and Mahommedan governments. Tobacco was introduced into China during the 16th century, although its use was strongly prohibited.

It was not till the middle of the 16th century that tobacco was seen growing in Europe, first at Lisbon, when the French Ambassador, Jean Nicot (hence the name Nicotiana), sent seeds to France in 1560, as those of a valuable medicinal plant, which was, even then, diffused throughout Portugal.

When America was first discovered, and afterwards when fresh tracts of the country were explored, the practice of smoking tobacco was found to be prevalent among all the tribes. Tobacco was introduced into Italy in 1560, this being about the same time as its introduction into France. Tobacco was probably first brought into this country in 1565 by Sir John Hawkins, or, at any rate, it seems unlikely that Sir Francis Drake, who is believed to have brought tobacco from Virginia in 1586, was the first to bring it into England.

Perhaps it is safe to assume that Sir Walter Raleigh and his companions were the first in this country to use the herb for smoking purposes; this was in 1584.

One thing, however, is very certain, and that is that the custom of smoking tobacco very quickly succeeded its introduction, and the growth of this habit, in spite of the most strenuous opposition, cannot fail to strike us as remarkable.

### *Source.*

Tobacco is the leaf of *Nicotianum Tabacum* and allied species. The genus *Nicotiana* contains about seventy-three species. Of the various species, *N. Tabacum* is by far the most extensively cultivated. It is a fine plant, growing to a height of six or seven feet. The leaves are sometimes two feet in length, and average about eighteen or twenty inches; they are very shortly stalked, and the base is more or less amplexicaul; the flower is pink, or pale red. It constitutes a very large proportion of commercial tobacco, being known and cultivated nearly all over the world.

American tobacco is almost exclusively of this species, although many varieties of it are now recognised, such as Kentucky, Big Frederic, Virginia, etc. The same plant furnishes the tobacco of Havana, France, Holland, Belgium, and others. The next important species is *N. Rustica*, or Syrian tobacco. This is a much smaller plant, averaging three and a half feet in height; it has a greenish flower; it furnishes the Turkish, Syrian, and perhaps the Latakia tobaccos. It is a native of America, but is now cultivated chiefly in Asia, Africa, and Europe. It is a hardier plant than *N. Tabacum*.

The third important tobacco is *N. Persica*, which has a white flower. These three species probably constitute the whole of the tobaccos grown, although each has many varieties, especially the first, *N. Tabacum*, which almost invariably forms a fresh variety when it is transplanted.

Until quite recently, "Tumbeki," the Persian tobacco of Eastern commerce, was thought to be the produce of *N. Persica*, some few experts holding the opinion that it was obtained from *N. Rustica*.

This led to much discussion, followed by much conflicting literature, so that seeds of the plant which yielded the tobacco in question were obtained from various reliable people in Persia, and sown at Kew. Meanwhile entire plants were also examined, and resembled neither *N. Rustica* nor *N. Persica*, and when the plants grown from the seeds received from Persia were examined, they turned out to be those of *N. Tabacum*. This was published in the *Kew Bulletin* for 1891, p. 84.

Not feeling quite convinced on the subject, on account of the various opinions obtained from different sources, I wrote to Kew last week, and two days ago received the following reply from the Director, Mr. W. T. Thiselton Dyer, F.R.S., etc.:—

> "Dear Sir,—As to Shiraz tobacco, there is no ambiguity as to the conclusion arrived at in the *Kew Bulletin* for 1891, p. 84. What is ordinarily called Turkish tobacco, and, as far as I know, only used for cigarettes, is the produce of *Nicotiana Rustica*."

This note on the source of Turkish tobacco is in harmony with the statement previously made by me, which I wrote a fortnight ago.

### *Constituents.*

The characteristic organic constituent of the tobacco plant is the alkaloid nicotine, with which is generally associated the essential oil or "tobacco camphor," viz., nicotianin. The proportions which all the organic substances in the plant bear to one another greatly affect the aroma and taste of the tobacco. The burning is somewhat influenced by them, but far more by the mineral or inorganic constituents present.

The freshly-cut leaves contain over 80 per cent. of water, and the proportion of nicotine varies from 1 to about 10 per cent.

Syrian is one of the lowest, that is, as regards the percentage of nicotine it contains. Two distinct samples that I examined, although widely differing from each other, gave an average of only ·852 per cent., the actual figures being 1·093 and 0·612.

The process of determination was as follows:—

Twenty-five grammes (or more or less, according to the amount of the sample at my disposal) of the dried and powdered tobacco was intimately mixed with slaked time and distilled in a current of steam until the condensed steam was no longer alkaline; the distillate was slightly acidulated with dilute $H_2SO_4$ and evaporated to a conveniently small bulk. This was made alkaline with soda, and agitated repeatedly with successive portions of ether. The separated batches of ethereal solution of nicotine were then mixed and exposed to the air in a cool place. This exposure to the air carries away ammonia, if any be present, as well as ether.

Water was added to the ethereal residue, and the amount of nicotine present determined by decinormal $H_2SO_4$, using methyl-orange as an indicator. 1 C.c. of decinormal $H_2SO_4$ represents 0·0162 gramme of nicotine ($C_{10}H_{14}N_2$).

It is important that the nicotine should not be left about longer than is absolutely necessary, since it is appreciably volatile at the ordinary temperature.

Sometimes the unconcentrated ethereal solution is titrated, but in such cases ammonia, if present, would make the results high. The neutralised solution is therefore separated from the ether and evaporated to dryness over a water-bath and weighed. Some prefer to add a few C.c.'s of decinormal acid before evaporating, and these would, of course, have to be taken into account.

The residue is treated with absolute alcohol, which dissolves the sulphate of nicotine, but not the ammonium sulphate; the latter must be dried, that is, freed from alcohol and weighed, and this weight, deducted from the weight previously obtained of nicotine sulphate, will leave the absolute weight of nicotine sulphate $(C_{10}H_{14}N_2)_2H_2SO_4$.

*Table of Results, arranged according to per cent. of Nicotine.*

| Variety examined. | Amount of moisture present in sample, per cent. | Total ash, per cent. | "Alkaline salts," i.e. ash, sol. in HCl, per cent. of 100 pts. ash. | Nicotine, per cent. |
|---|---|---|---|---|
| 1. Syrian leaves (*a*).. .. | 8·70 | | | ·612 |
| 2. American chewing .. | | 20·6 | 58·25 | ·935 |
| 3. Syrian leaves (*b*) .. | 8·00 | | | 1·093 |
| 4. Chinese leaves .. .. | 6·12 | | | 1·902 |
| 5. Turkish (coarse cut).. | | | | 2·500 |
| 6. Golden Virginia (whole stripe).. .. .. .. | 14·00 | 17·82 | 70·70 | 2·501 |
| 7. Gold Flake (Virginia).. | | 18·11 | 71·60 | 2·501 |
| 8. "Navy-cut" (light coloured) .. .. .. | | 18·6 | | 2·580 |
| 9. Light returns (Kentucky).. .. .. .. | | 16·1 | 61·11 | 2·733 |
| 10. "Navy-cut" (dark "all tobacco").. .. | | 16·6 | | 3·640 |
| 11. Best "Birds-eye" .. | | 16·0 | 64·33 | 3·931 |
| 12. Cut Cavendish (*a*) .. | | 18·62 | 70·90 | 4·212 |
| 13. "Best Shag" (*a*) .. | | 15·46 | 80·25 | 4·907 |
| 14. "Cut Cavendish" (*b*).. | | | | 4·970 |
| 15. "Best Shag" (*b*).. .. | | | | 5·000 |
| 16. French tobacco .. .. | | 17·29 | | 8·711 |
| 17. Algerian ,, (*a*).. .. | | 17·29 | | 8·818 |
| 18. Algerian ,, (*b*).. .. | | 17·40 | | 8·900 |

The above list includes no proprietary tobaccos, and it must not be inferred that the samples examined were standard samples. They were obtained from very different sources, no two samples of one kind being obtained from the same source. The ash was not determined in Nos. 1, 3, 4, and 5, for want of material, while the examination of Nos. 15, 16, 17, 18, was incomplete for lack of time.

The average percentage of nicotine in Syrian tobacco is from 1 to 2; in Manilla and Havana 1 to 3; Virginian and Kentucky up to 7; French up to 9. The French and Algerian samples which I examined resembled each other very closely in every way, which may probably be explained by the fact that much of the Algerian tobacco is imported into France and manufactured at the Government factories.

It is supposed that the aroma given off during the smoking of tobacco is due rather to the nicotianin or tobacco-camphor than to the nicotine, although the former is present only to a very small amount. The odour given off from an aqueous solution of nicotine, however, was variously described to me as like that of senna tea, or a saucepan that cabbage has been boiled in.

The conditions of soil and climate which favour the production of nicotine retard that of nicotianin and *vice versâ*. The quantity of nicotine present is no criterion of the quality of the tobacco, inasmuch as many of the most delicately-flavoured and choice tobaccos contain little of it. The cellulose, gum, etc., in the leaf give off objectionable odours in burning, and fermentation gets rid of or modifies these when present in considerable quantity. The fermentation must not, however, be excessive, or objectionable and injurious ammoniacal salts would be formed. Many tropically-grown varieties contain little of these unpleasant constituents, so that in some cases fermentation is dispensed with, and in many others is greatly lessened, sun-drying alone often proving sufficient for the preparation of the leaves. The chief organic acids in tobacco are malic, citric, and oxalic, while acetic acid has been found in fermented tobaccos.

The ash of tobacco varies greatly in composition and quality, although the percentage is from 12 to 20; it invariably contains potassium, sodium, calcium, magnesium, and aluminium, usually a trace of iron oxide, and carbonic, phosphoric, silicic, and sulphuric acids, and chlorine.

Potash is sometimes present to the extent of 30 per cent. of the total ash, and should be mainly combined with the organic acids. The ready decomposition of the organic potassium salts by heat constitutes a good burning tobacco. The potassium salts are converted into carbonate in burning, and consequently the combined presence of potassium and carbonic anhydride in the ash may be taken as a good indication. From the excess of these two, of course, it follows that the other constituents must be present in smaller proportions, the lime generally lower than the potash, with smaller quantities of magnesia, soda, and alumina. Iron is objectionable, giving a red ash. Lithium is present in the ash of most tobaccos. Silicic* and phosphoric acids, even in considerable quantity, do not seem to effect the combustion to any great extent, but chlorine, except in very minute quantity retards it.

The leaves contain more calcium, magnesium, and silicic acid, and less alkali, phosphoric acid, and chlorine than the stalks. The stalks contain much potassium nitrate, and their presence in "bird's eye" tabacco renders this tobacco very readily combustible, without any addition.

According to Nessler, tobacco burns best when it contains a large proportion of potassium malate, but the effect may be imitated by the addition of acetate or other organic potassium salt: the combustibility may be diminished by the addition of magnesium or calcium sulphate. Sulphates seem to favour proper combination. Mayer observes that tobacco which burns badly can be made to burn well by steeping it for twenty-four hours in a 0·5 per cent. solution of potassium acetate or nitrate. A solution of calcium acetate of the same strength gives excellent results, as I have proved.

Tobacco seeds yield by pressure 30 per cent. of a greenish-yellow, mild, odourless oil, having a sp. gr. of ·923 at 15° C. This oil quickly dries by exposure to the air.

### *Importation.*

The forms in which tobacco is imported into this country are many, each variety being purchased according to its suitability for the preparation of some fancy tobacco, and although commercial tobacco is divided into five classes, every manufacturer has his own method of selection.

The chief imported varieties are Viginian, Kentucky, Maryland, Indiana, Java, China, Japan, Ceylon, Turkish, and German. The largest quantities come (1) from the U.S.A.; (2) Germany; and much less from Japan, India, China, and Eastern countries.

Imported tobaccos generally contain about 14 per cent. of water, although apparently dry and brittle.

### *Manufacture.*

The bulk of imported leaves are used for the manufacture of the fancy tobaccos, the material being chosen according to the variety of saleable tobacco required.

Shag is usually made from the darker and stronger varieties.

In "bird's eye" the prepared leaves are placed in such a manner upon one another that they will be cut right across the midrib.

For "twist" or "cake" tobacco the leaves are stripped, moistened, and placed end to end, and then spun into a rope round a reel, or wound into a ball, either by hand, or by a spinning-wheel. The whole is then steeped in liquor, and finally oiled with sweet oil. The oiling process greatly affects the ready burning of this tobacco.

In America it is usual to saturate the leaves and stalks previous to pressing into cakes with molasses, or a mixture of this substance and liquorice. I have extracted a considerable quantity of glycyrrhizin from this cake tobacco, and have also found ligulate florets in it.

Leaves which are to be made into cigars must possess the following qualities:—They must be of a good colour, possess a fair amount of body, and an agreeable odour, and must give off an agreeable aroma when burning, and last, but by no means least, they must burn well. It should also be mentioned here that a fine texture and small veins are favourable characteristics. A machine is now in use by which midribs and stalks are flattened by pressure, so that they may appear like parts of the lamina.

The "burning test" is to ascertain whether the leaves will continue to burn after being once lighted, although this can be no guide as to the quality of the cigar. Sometimes cigars are made of tobacco which will only burn very slowly and difficultly, in which case it is the rule to mix "fiery" tobacco with them, but this method produces only inferior cigars, and unless they are made with extreme care they do not burn evenly.

The best cigars are made of one kind of leaf only, but in common kinds the interior is a mixture, made up of stalks, etc., concealed in an attractive wrapper. In many foreign cigars the wrapper has been found to contain much potassium nitrate, while the interior, consisting of the same kind of tobacco, contains none. This is added so as to make the wrapper burn down evenly with the interior. Glycerin is said to be sometimes added to keep the cigars from becoming too dry.

Cigars are rarely adulterated, and though not always what their outside would represent them to be, they contain nothing but tobacco. Cases have been reported of cigars containing hay, cabbage, and brown paper, but such cases are extremely rare.

The chief imposition seems to be the practice of placing home-made cigars in imitation foreign boxes. Another custom is to send German and other continental cigars to the West Indies, whence they return as a special brand of West Indian cigars.

Cigars chiefly come from the West Indies (and these, of course, include the German ones), the Philippine Islands, and, recently, from Mexico and Jamaica.

Cigarettes are usually made of light tobacco, such as Turkish, Salonica, etc., which have but little odour, and this a pleasant one. American tobacco is largely used for this purpose.

Snuff is made from finely powdered tobacco stalks. The moisture should not exceed 25 per cent., but is sometimes present to the extent of 50 per cent. It is variously scented. In the United Kingdom nothing is allowed to be added to snuff except the carbonates, chlorides, and sulphates of potassium and sodium, and the carbonate of ammonium.

### *English Grown Tobacco.*

From the very first the cultivation of tobacco in England was a success, but this was prohibited by James I. and Charles I., though with little effect. The home-grown tobacco was heavily taxed, and it was expected that this would cause the cultivation to be dropped for want of profit. This heavy taxing was due in a great measure to the difficulty experienced in collecting the duty, which was extensively evaded. In 1652 the cultivation in England was prohibited, and shortly afterwards an order was issued to destroy the plantations. The illegal growth, however, continued, and the cultivation was not finally stopped until the reign of George III., when, in 1782, an Act to this effect was passed, and the tobacco trade was forced out of the country.

Extensive plantations in Yorkshire were by this Act destroyed, and the planters heavily fined and imprisoned.

The growth of tobacco in Ireland was not so hampered by opposition, and so it managed to struggle on till 1831, when it was suddenly suppressed.

In 1886, owing to the agricultural depression in this country, the question of cultivating tobacco in England was once more raised. Permission was sought and obtained, with severe restrictions, to make experiments on the subject.

The results were, to say the least of it, promising, although nobody expected we should be able to grow Havana cigars in Kent, even though they do make them in Germany.

In 1887, permission was again obtained, but as soon as the new industry sprang up in this country, it encountered tremendous opposition, and was finally stopped.

Some samples of English-grown tobacco were analysed, and found to contain, on the average, light leaves 3·6 per cent., and the dark leaves 2·4 per cent. of nicotine. It will be noticed that the proportion of alkaloid in the light leaves was higher than in the dark, the reverse of what is usually the case.

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The paper was illustrated by a large variety of specimens, and was followed by a discussion, in which the Chairman, Messrs. Bryan, St. Cyr, Potter, Hill, Lander, and the Secretary took part.

A "Note on Guaiacum Resin" was then read by Mr. E. L. N. St. Cyr, who described, from personal observation, the methods used in the West Indies for collecting the resin. Besides the methods usually described, of incision and extraction by igniting the ends of a log, a process sometimes employed consisted in chopping off the sap-wood and heating the heart-wood in small fragments in an earthen pot, the melted resin being then poured off. A specimen of heart-wood yielded to spirit 26 per cent. of resin.

The note gave rise to a discussion, in which the Chairman, Secretary, Messrs. Potter, Hill, and Bryan joined.

Mr. H. A. Potter then read a "Note on Linseed," chiefly descriptive of the preparation of the flax fibre for weaving, etc., as practised in the Netherlands. It was followed by a discussion, in which the Chairman, Messrs. Kitson, Hill, and the Secretary took part.

The meeting then adjourned.

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## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, January 11, the chair was taken by the President, Mr. E. F. Harrison, and the following communication was read:—

### COMPRESSED DRUGS.

BY E. J. PARRY, B.SC., AND P. A. ESTCOURT, A.I.C.

Convenience, accuracy, and elegance are a most acceptable combination, and this probably accounts for the extensive use of drugs in the compressed form. The number of preparations now put forward and the quantity being used led us to obtain samples from various makers, with a view to determining whether the compressed drugs on the market were what they should be or not.

Manufacturers state that in many cases the use of an excipient is necessary in order to increase the solubility of the drug. This is hardly correct, for in the course of our analyses we have repeatedly found perfectly insoluble excipients used with freely soluble drugs. It may be taken almost for granted that excipients are used simply for the manufacturer's convenience, except in a few exceptional cases, such as disintegrating pellets.

The more common of the drugs sent out in this form, such as potassium chlorate, sodium bicarbonate, soda-mints, etc., are too cheap to adulterate. The only point in connection with potassium chlorate is the presence of chlorides, which is in such traces as to be of no importance. With regard to sodium bicarbonate we find that in almost every case a noticeable amount of carbonate is present, varying from 3 per cent. or 4 per cent. to even 8 per cent. in one sample. The only thing to be noticed in soda-mints, except that here, too, we find a large amount of carbonate, is that where the label indicates a certain quantity of ammonia there is seldom anything like the full quantity. But of course in this case it requires but a short time for the ammonia to volatilise, hence the deficiency. Ammonium chloride is usually sent out in three grain pellets. A number of the pellets were weighed and the active ingredients determined by titration with silver nitrate.

The following results were obtained from five samples:—

| Amount of $NH_4Cl$ guaranteed, in grs. | Amount of $NH^4Cl$ found, in grs. | Weights in grs. | | |
|---|---|---|---|---|
| | | Highest. | Lowest. | Mean. |
| 1...... 3 0 | 3·08 | 3·23 | 3·07 | 3·17 |
| 2....... 3·0 | 2·66 | 3·16 | 2·62 | 2·91 |
| 3....... 3·0 | 3 03 | 3·16 | 2·95 | 3·03 |
| 4....... 5·0 | 5·79 | 6·10 | 5·26 | 5·84 |
| 5....... 5·0 | 4·70 | 4·80 | 4 60 | 4·70 |

We examined five samples of saccharin pellets, determining the saccharin by complete oxidation of the sample with nitrate of potassium and caustic potash, and the resulting sulphuric acid as barium sulphate. The following results were obtained:—

| Amount of Saccharin guaranteed, in grs. | Amount of Saccharin found, in grs. | Weights in grs. | | |
|---|---|---|---|---|
| | | Highest. | Lowest. | Mean. |
| 1 ..... ·5 | ·66 | 1·30 | 0·97 | 1·14 |
| 2...... ·5 | ·54 | 0·97 | 0·72 | 0·87 |
| 3...... ·5 | ·51 | 0·83 | 0·77 | 0·80 |
| 4...... ·5 | ·61 | 1·30 | 1·02 | 1·21 |
| 5...... ·5 | ·44 | 1 03 | 0·94 | 0·99 |

Some samples of sulphonal pellets were examined in the same way as the saccharin pellets, and others in more direct ways, depending on the excipient used. The following are the results for these pellets:—

| Amount of Sulphonal guaranteed, in grs. | Amount of Sulphonal found, in grs. | Weights. | | |
|---|---|---|---|---|
| | | Highest. | Lowest. | Mean. |
| 1...... 5·0 | 4 80 | 4·9 | 4·7 | 4·8 |
| 2...... 5·0 | 4·95 | 5·9 | 5·0 | 5·57 |
| 3...... 5·0 | 4·74 | 5·35 | 5·03 | 5·18 |
| 4...... 5·0 | 5·30 | 6·93 | 6·19 | 6·47 |

Antipyrine is a difficult drug to compress in a presentable manner without excipients. Our results for these pellets were as follows, the methods used being varied, as the circumstances required:—

| Quantity of Antipyrine guaranteed, in grs. | Quantity of Antipyrine found, in grs. | Weights in grs. | | |
|---|---|---|---|---|
| | | Highest. | Lowest. | Mean. |
| 1.......5·0 | 4·29 | 4·55 | 4·03 | 4·29 |
| 2.......5·0 | 4·86 | 6·24 | 5·98 | 6·07 |
| 3.......5 0 | 4·31 | 5·30 | 4 80 | 5·11 |
| 4.......5·0 | 3·80 | 5·19 | 4·55 | 4·89 |

Quinine pellets, as we have obtained them, are often made with the acid sulphate, but quite as often with the neutral salt. Here our usual method was to precipitate the quinine in the usual way with sufficient ammonia, and dissolve out the quinine with chloroform or ether. Our results in this case were very satisfactory:—

| Amount of Quinine Sulphate guaranteed, in grs. | Amount of Quinine Sulphate found, in grs. | Weights in grs. | | |
|---|---|---|---|---|
| | | Hghst. | Lowest. | Mean. |
| 1.......3·0 | 3·06 | 3·51 | 3·33 | 3·40 |
| 2.......2·0 | 2·02 | 6·50 | 5·60 | 6·06 |
| 3.......5·0 | 4·41 | 5·64 | 5·30 | 5·50 |
| 4.......2·0 | 2·06 | 4·50 | 4 00 | 4 25 |

In conclusion, we have to thank those manufacturers who have so willingly given us any information that we required.

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The President said it was often remarked that the chemist was fast becoming a mere retailer of tabloids and patent medicines. As long, however, as doctors prescribed medicine in a compressed form, the chemist must be prepared to supply it. The physician himself ought to be the best judge as to the desirability of ordering medicines in this form, but it devolved upon the chemist to see that when so ordered it was what it was represented to be.

Mr. Gane said the paper was one of great value, as in few cases has a chemist any guarantee that when he sells pellets they are what they are stated to be. In many cases pellets are prepared by quite inexperienced persons, sometimes even by girls, instead of, as they should be, by properly qualified pharmacists.

Mr. Davies urged that too much reliance was placed upon the manufacturers of these pellets. He had found some antipyrine pellets almost insoluble even in warm water.

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A discussion was then introduced by Mr. C. Morley on the question, "May dispensers deviate from a literal translation?" special allusion being made to the point recently considered by correspondents of the *Pharmaceutical Journal* as to what is meant by "pil. opii." It was suggested that if that instance constitutes a precedent for departing from a literal translation, dispensers must be careful that it did not dispose them to laxity in that respect.

The President said he should certainly send out a pill containing one grain of powdered opium if pil. opii gr. i. were ordered. Mr. Morley had not sufficiently emphasised the fact that pil. opii was but a synonym in the B.P.

Mr. Roe said the chemist must let common sense prevail. Often if he would put a question or two to the patient he would get enlightenment and find what was required.

Mr. Gane said that, although in most cases a doctor expected a pill containing powdered opium to be dispensed, occasionally it was not the intention, and the chemist then incurred a great responsibility who dispensed such. Of seventeen medical men to whom a correspondent of the *Pharmaceutical Journal* had written, nine were in doubt as to what was right.

Messrs. Davies, Ralph, James, and Barnard endorsed the view that a pill containing powdered opium was required.

Mr. Morley having replied,

Mr. D. S. Davies again brought forward his resolution, of which notice had been given on Thursday January 4:—

> "That the Council be requested to take into consideration the desirability of organising Sunday outings for the Association, and to make arrangements for the same."

He had brought forward the motion before, but might again say that in the arrangements to be made, if the meeting agreed with his resolution, certain points would have to be considered as to the admission of ladies or non-members to the excursions. He deprecated any desire to do anything but provide well-arranged outings that would ensure pleasant but perfectly harmless and decorous recreation, which he thought would do much to cultivate sociability among members.

Mr. Gane seconded the motion.

The President said Mr. Davies had previously brought his motion forward, and it had been referred to the Council. After consideration, however, they had felt it desirable, as notice had not been given that the motion would be brought forward, to let the subject again come before an ordinary meeting. Notices had been sent to every member in order that a full discussion should take place on it, and that the opinion of all members be had before any steps were taken.

After a long discussion, the President put the resolution, which was carried.

# Provincial Transactions.

## THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

Under the auspices of this Association, a meeting of chemists' assistants and apprentices was held on Thursday evening, January 11, at the Foresters' Hall, Octagon, Plymouth. The President of the Association, Mr. J. G. Netting, occupied the chair, Mr. Rendle, of Devonport, a Vice-President, being also in attendance. Messrs. Hodge and Westcott were elected to represent the assistants on the General Committee, the former being also appointed as Secretary to the assistants and apprentices. The membership of the Association is steadily increasing, and the first annual meeting is to be held in the course of a few days.

The quarterly meeting of the Association was held at the Foresters' Hall, Octagon, Plymouth, on Wednesday last, the 17th inst., at 3 p.m., Mr. J. G. Netting, President, in the chair. After the general business and the enrolment of new and honorary members, who now number nearly eighty, the Secretary read the following paper:—

### THE CHEMIST THE LEGITIMATE DISPENSER.

BY JAMES COCKS.

We are all painfully aware that during the past twenty years, through various causes, retail pharmacy has been gradually getting worse, until we hope now it has reached its climax. It is our duty to try and trace the cause, and find a remedy to remove the same. Of the many causes, to my mind, the most important are (1) allowing what I consider our monopoly (by reason of our qualification), dispensing, to a great extent to be performed by inexperienced unqualified individuals, the chemist becoming patent medicine agent in the place of the stationer, and (2) the charging of ridiculously low prices. As long as we obtained full prices for patents, etc., things went fairly well, but when they and the whole retail became cut we came to grief, because the returns were too limited, except in a very few instances, for the increase in business to make up for the deficiency in profit. Now it occurs to me that our most hopeful remedy is in claiming the right to dispense, which has cost us time, money, and brains to acquire the knowledge how to do it in accordance with the law. As to the way how, I would suggest by forming local societies, joining hands, and bringing pressure to bear, that the Pharmacy Acts be so amended that private practices and surgeries should be considered on a par with open shops. For the double reason—protection of the public, and carrying out the original idea of the Act—the putting up of physic by the coachman, errand boy, or servant has been treated as a joke quite long enough, and it is high time we looked at it from a serious point of view. Some of our friends will say "Yes, but if you press that, we shall have the medical men retaliating by trying to stop our prescribing." In answer to that, I say they already do so; note the recent case tried at Clerkenwell, Apothecaries' Society *versus* Alabone, in which they were successful in inflicting a fine. The defendant had been a qualified man, but struck off the roll for advertising, which placed him on the same footing legally as a chemist. Also bear in mind that if you should happen to sell a grey powder for a child, and it died suddenly after taking the same, probably of convulsions, an inquest follows, and if the doctor happens to be malicious you would find yourself in a queer position, with possibly a vote of censure from the jury. If we could bring it about I am quite of opinion that the majority of medical men would, rather than go to the expense of keeping a qualified man, prefer either writing prescriptions, or coming to terms with the neighbouring chemist, then we should each take our proper place as fitted by our training. Doctors prescribe, chemists dispense, our relations become more friendly, and there is a chance of our remuneration being more consistent with the skill required in our labours. In conclusion, I do not mean to infer that what I have suggested will prove the missing link to a balmy future, but it is an attempt to carry out the idea of our Association, in trying to remove one of the anomalies that our calling is heir to.

A general discussion followed, in which Messrs. G. Breeze, J. C. Park, R. H. Rendle, Stoke, J. D. Turney, Young, Liskeard, J. Harvey Bailey, J. Barge, J. G. Netting, A. D. Breeze, and Kelley took part. After Mr. Cocks' reply to the same, a vote of thanks, proposed by Mr. A. D. Breeze, seconded by Mr. Kelley, was duly carried.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The annual dinner of this Society was held in the Alexandra Hotel on Thursday evening, January 11. Between fifty and sixty were present. Mr. Frank Walker, the President, was in the chair, and was supported by Dr. F. C. Larkin, Dr. J. R. Logan, Mr. Ed. Davies, and others. Dr. Logan, in responding to the toast of "The Medical Profession," referred to the introduction of the eight hours' system into the Government arsenals, and strongly advocated more leisure for physicians and pharmacists. This could only be brought about by friendly combination. Mr. Ed. Davies gave the toast of "The Pharmaceutical Students' Society." The other toasts were "The Pharmaceutical Society" and "The Visitors." A long and interesting programme of songs, etc., was much appreciated.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

The first annual dinner in connection with this Association was held on Thursday, the 11th inst., at the University Arms Hotel. Mr. Alderman Deck occupied the chair, and the party numbered between thirty and forty. After the usual loyal toast, the "Pharmaceutical Society of Great Britain" was proposed by Mr. Richard Sturton and responded to by Mr. A. Deck (local secretary); "The Town and University of Cambridge," by Mr. A. Sidney Campkin, J.P., to which Messrs. Councillors Greenwood and A. Ivatt, M.A., replied; "The Cambridge Pharmaceutical Association," by Mr. Herbert Cook, replied to by Mr. C. S. Addison; "The Chairman," by Mr. Joseph Sturton. The musical programme was contributed to by Messrs. Barker, Ivatt, Peck, Field, and Greenwood.

# World's Congress of Chemists.

## THE EDUCATION OF INDUSTRIAL CHEMISTS.*

BY GEORGE LUNGE,

*Professor of Technological Chemistry at the Federal Polytechnic Schools, Zurich.*

(*Concluded from page* 577.)

Allow me to give you a very striking example of the novelty of English superiority in the field, which is most familiar both to my hearers and to myself; I mean the alkali trade. The name Leblanc at once recalls the fact that the manufacture of soda from common salt was invented in France, but few Englishmen will realise the further fact that it took thirty-five years before England entered the race in this field, while numerous alkali works had been erected in France and elsewhere in the meantime. It is true that in England the alkali manufacture was impossible so long as an enormous duty weighed upon the salt; it is equally true that immediately after this incubus had been removed, the alkali manufacture sprang up in Great Britain, and in a very short time left all other countries far behind in that line; it is true that this was not merely due to favourable external circumstances, such as the cheapness of salt and coal, and the easy communication with the sea, but perhaps quite as much to the long string of English inventions which have made the English methods of alkali manufacture the pattern from which all other nations have immensely profited. Nobody will more heartily acknowledge than I how much honour and gratitude the whole world owes in that respect to British inventive genius and British enterprise. But that cannot obliterate the fact that, on the one hand, the first British alkali works is less than seventy years old, and that, on the other hand, new methods have already partly superseded those worked out in England, and partly threaten to do so even more in the future. We behold here a strange turn of the wheel of fortune. The invention of a Frenchman, Leblanc, has laid the foundation of England's greatness in the alkali trade; but an English invention, the ammonia-soda process, could not be worked out into a practical process in that country, in spite of many endeavours, and it was left to a Belgian, Solvay, to do this, and to re-introduce the process into England, where it is now carried on according to Solvay's method. It is notorious that the English alkali trade is no longer rapidly expanding, while that of the other industrial nations has made enormous strides. Customs' duties and other external circumstances partly account for this; but a very important part is also played by the more careful scientific training of the managers and chemists in the other countries, exceptions on both sides, of course, notwithstanding.

How the Germans have wrested the most brilliant of all chemical industries, that of the coal-tar colours, out of the hands of the English, in whose country the first discovery of these colours was made, and who had to supply all the raw materials for them, is an often told story, which I need not repeat here.

All this (I could give many more examples of the same class) further confirms my opinion that no nation, whether the American or the English, or any other, has a right to boast of being for ever in the van, and to look down upon other nations as innately inferior to itself. Natural advantages of situation, mineral wealth, inventive genius, accumulated capital, an enterprising spirit, are all enormously important factors in creating and extending industries, but they are not omnipotent, not even if all combined; the victory over all these accidental or inarticulate forces will ultimately fall to the scientifically trained human mind; just as the engineer in charge of a large steamer holds in subordination not merely all the brute powers of fuel, furnaces and machinery, but also a large number of human beings, immensely superior to him in bodily strength, but inferior in knowledge.

Well, how is a first-class engineer brought up? Merely on a knowledge of the physical and mathematical theorems concerning the action of steam and the laws of motion? Certainly not. Nobody would expect such a man to be able either to build or to work an engine. He must be brought face to face with the hard facts of reality; he must know all about casting, forging, and other ways of shaping metal; he must know a great number of practical points indispensable for designing machinery, and too many other matters to enumerate here. And it is just the same with a manufacturing chemist. If he enters practical life, trusting merely to theoretical knowledge, and to such practice as he has gained with glass, porcelain and platinum vessels in a laboratory, he is at first as helpless as a child, and he must begin at the beginning, picking up what he can on his way. Some people manage to do this very fast, and it is just to this "practical sense" that the English system of education leaves the students of chemistry; but, I say it with the fullest conviction, it is decidedly wrong there. The time is past when the crudest of all machinery would do for chemical purposes, and when chemists could try to translate their laboratory operations into manufacturing work by merely magnifying the apparatus and substituting one material for another, in which attempt they only too frequently broke down. All this has become the subject of special studies. A manufacturing chemist of first-class standing must nowadays know almost as much about the strength of materials as an engineer, and he must add to this a knowledge of the behaviour of all sorts of metals, stone, earthenware, wood, of various coatings, of joints made in different ways and so forth, against the action of ever so many chemicals under varying conditions of concentration, temperature, and pressure. He must know how to produce heat, and in many cases cold, to the necessary degree in the most efficient and economical way. The construction of furnaces of all kinds belongs to his special domain. He must know how to design large vessels of various materials, both open and closed, with or without agitating machinery adapted to special requirements. He must employ presses, pumps, drying apparatus, having regard to what will answer not merely in the engineer's workshop, but under the special conditions of chemical attack and of high temperatures. The arts of disintegration, evaporation, filtering, distilling, fusing, the action of gases upon liquids and solids, the heating under pressure, and other operations constantly carried on in chemical works have been so thoroughly developed as to amount almost to special sciences. One of the most distinguished men in the domain of chemical technology, who at the same time would have done honour to any chair of pure organic chemistry, and who, more than any other living technical chemist, represents the theoretical element in technology, Heinrich Caro, formerly director of the Badische Anilin und Sodafabrik, in Ludwigshafen, in a lecture delivered last year before the Berlin Chemical Society, distinctly declares that chemists for the actual work in a chemical factory (*Betriebs Chemiker*) cannot receive their training for the above requirements at the universities, but only at the polytechnic schools, and this judgment has all the greater weight, as Dr. Caro was formerly of the opposite opinion, viz., that at least at such large works as theirs it was best for the chemists to receive a purely scientific training, leaving the constructing work to the engineers appointed at the same works, an opinion which he has seen reason to change after prolonged experience with a large number of chemists from both universities and polytechnic schools.

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* From the *Journal of the American Chemical Society.*

Nobody indeed who looks at the present state of chemical industry with an unprejudiced eye can deny that a mere training in theoretical chemistry is as unable to cope with the competition to be met with in the rest of the world as is the formerly universal rule-of-thumb management. We must needs teach our future chemical manufacturers how chemical operations are and ought to be carried out on the large scale. To accomplish this we must approach the subject from various sides. We must in the first instance teach our students at least the elements of mechanical engineering, of building construction, and of furnace building. This supposes a much better knowledge of mathematics than chemists formerly used to possess, as well as some practice in mechanical drawing. We must further introduce them to a description of the various classes of work they meet with in their career. This should be done in different ways. At all events the leading chemical industries ought to be described, going into all essential details of apparatus, and thus serving the double purpose of a preparation for those intending to enter that special field, and of giving to all others important suggestions how the appliances invented for one manufacture may be used in another, possibly entirely different from the first. Many of my former students who are now employed in the industry of coal-tar colours, or in dyeing and tissue printing, have told me how useful to them has been the description which they received as students of the apparatus employed in the manufacture of heavy chemicals. The reverse is just as possible, and actually met with. Thus thirty, or even twenty years ago, the use of centrifugal machines and filter presses was almost unknown in the alkali and chlorine manufacture; nowadays it is quite common. For another very practical reason it is necessary to offer at a technical college instruction in all the more important branches of technical chemistry, viz., because such a college should enable all its students to take situations wherever they find them open. This applies to the great majority of students, although there is always a number who go to college with a specific purpose, principally those connected with manufacturers whose works they are destined to enter after finishing their studies. I cannot, therefore, approve of the plan proposed by an Austrian professor, according to which each polytechnic is to cultivate a separate specialty—say sugar making, or brewing, or alkali making, or dyeing, or colour making, and so forth—with the idea that a youth of eighteen years, before entering on his academical career, should absolutely fix what special manufacture he is to devote himself to afterwards. Suppose he has studied four years with the entire object of becoming a sugar manufacturer, but at the end of that time it is seen that that trade is declining, or has migrated elsewhere, or that the supply of sugar chemists is largely in excess of the demand. What can he then do but throw up all he has studied and begin over again on a different line? If he has prepared himself less specially, but more universally, he will probably not be quite so useful at a sugar works for the first few months, but he has the chance of taking to any other manufacture where there is a vacancy, and to pick up whatever situation comes in his way.

I certainly cannot approve of the other extreme, introduced at the Ecole Centrale in Paris, where all the students, whether they mean to follow the profession of civil engineering, of mechanical engineering, or of industrial chemistry, are taught exactly in the same way, and receive instruction both in mechanical and chemical subjects. I do not know whether that system produces good engineers; but I am told it does not produce good chemists, and I can readily believe it.

I should also like to correct a mistake, not infrequently met with, viz., that the teaching of chemical technology is of comparatively little value, because the professors themselves generally are not acquainted with the very last phases of progress made in the manufactures, seeing that there are constantly new inventions made, many of which are kept secret, or are very imperfectly described by patents. This is perfectly true, and yet it is of very little importance. No teaching of real or imaginary trade secrets would enable a mere book or laboratory student to carry on real work on a large scale; only practice itself can do that. But that practice will be all the more quickly and thoroughly acquired the more the student has heard of technology generally, and of the special branch to which he devotes himself afterwards. Any fresh improvements he finds applied when entering a manufactory will be quickly grasped by one who enters upon his practical work, armed with such general preparation as has been described, which has taught him to think and see matters in a technical light, as I have expressed it above.

There are some subjects which are common to all chemical operations on a large scale, and which ought to be learned by every student. The technology of water and of fuel are the principal subjects in question, and the latter especially opens out a large field, embracing the construction and working of heating appliances of all kinds These, together with the elements of engineering and building construction on the one hand, and with the thorough study of theoretical chemistry and the concomitant sciences of mathematics, physics, mineralogy, and geology, and lastly with practice in the chemical and physical laboratory and at the drawing board, ought to fill the first years of the study at a technical college. The last years ought to be devoted to chemical technology proper, and to a special study of such subjects as have not been sufficiently mastered before, or as are likely to form the main occupation of the student in later life.

The whole study is generally crowned by the obtention of a degree, in Germany either a "diploma," or the title of Ph.D. The latter, owing to the jealousy of the old universities, cannot yet be conferred by the polytechnic schools themselves, but it is very frequently earned by their students afterwards. I have found the greatest possible benefit to arise from this system of "diploma examination." A student, instead of losing himself in a specialty, and being too much absorbed thereby, to the detriment of his general scientific and technical culture, or of falling into habits of laziness and dissipation, or else of becoming an exclusive devotee to athletic sports, is compelled to concentrate his energies once more on all the more important branches of his life studies, and to carefully rehearse what he has once learned, but much of which he will have forgotten. Taking human and especially youthful nature as it is, there is no denying that mere abstract considerations of what may be good for a man's future are not sufficiently powerful to counteract the forces, both good and bad, which tend to draw a student away from his work, and that it is immensely better to hold out to him an immediate aim to strive for in healthy competition with his fellow students. The German polytechnics are in this respect less fortunate than our Swiss institute; in the former only a small minority of the students go in for the diploma, whereas with us most of the students enter with the purpose of ultimately obtaining the diploma. Many of them drop off on the way; some others, in spite of all exertions, do not reach the goal, but about half of the total number of students leave the school, not merely in possession of a piece of stamped paper, but in that of all the additional knowledge they have acquired in quest of that paper, and which they would not have got without such an inducement. It is a great satisfaction to our institution that its diploma is eagerly sought, and hard work bestowed upon it, by nearly all the sons of wealthy manufacturers, who have been born with a silver spoon in their mouth, and whose future places are absolutely secure to them without a diploma; but these young men are well under the sway of that healthy spirit of doing work which prevails at our institution, in consequence of the great value attributed to the diploma. Most of these wealthy young men are ashamed of standing lazily by, while their fellow students strain every nerve for the diploma; they want to show what mettle they are made of, and they therefore go in for the diploma as well, to their lasting benefit in more ways than one.

The diploma examination in our case comprises a full knowledge of general inorganic and organic chemistry, to the same extent as the universities require for the degree of Ph.D., further, of mechanics, physics, and mathematics, including the elements of the calculus, and at least some of the departments of natural history. In the field of chemical technology the general chapters are compulsory, but the candidate has the option of being examined in a number of special chapters according to his choice; further, in the elements of engineering and building construction. Moreover, each student must do a considerable amount of special laboratory work extending over a whole semester, by which he proves his skill in all departments of chemical analysis and in preparing any chemical substances described in chemical literature or in patents. For the diploma itself we do not require any difficult research work; but most of our graduates aspire to the title of Ph.D., and for this they are obliged to do substantial research work, which generally keeps them in the laboratory about a twelvemonth over and above their proper college time. When they have accomplished this, they have not merely got an ornamental title, but they have, what is certainly of greater importance, acquired such a mastery of our science that we can confidently dismiss them into practical life. Even then, it is hardly necessary to say, great differences exist among them. Some remain in modest situations all their lives, but others rise quickly to higher places, every one according to his abilities and to his deserts. The successful men, without a single exception that I know of, look with warm gratitude on the institution where they have received their scientific training, which has raised them above the haphazard luck of rule-of-thumb experience, as well as above the one-sidedness of autodidactic studies—both of which are excellent as far as they go, and not to be despised by any means in themselves, but neither of which can cope with a carefully devised and conscientiously carried out scheme of training the mind for the profession of a technical chemist such as I have had the honour of laying before you. Nobody is more conscious than I that at no existing institution has the beau ideal of such a scheme as yet been attained, but at Zurich we believe that we are, on the whole, on the right way, and that we shall do well not to exchange our plan for a totally different one, but rather try to improve it on the lines on which we are now working.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACT.

#### SALE OF LAUDANUM BY AN UNREGISTERED PERSON.

In the County Court, held at Kingston, on Friday, January 12, 1894, before his Honour Judge Lushington, the Council of the Pharmaceutical Society of Great Britain sued Percy Cooper for a penalty of £5, incurred on July 17, 1893, by a breach of the Pharmacy Act, 1868.

Mr. T. R. Grey, barrister-at-law, instructed by Messrs. Flux, Son and Co., appeared for the plaintiffs, and, in opening the case, stated that the defendant was an unqualified assistant in the employ of Messrs. Cooper, Price and Co., of 93, Kingston Road, Wimbledon, and was sued for having sold a poison, to wit, a preparation of opium, in contravention of section 15 of the Pharmacy Act. The offence was similar to that decided upon by the Queen's Bench Division in the Wheeldon case.

Defendant did not appear.

John Partridge, resident at Brixton, gave evidence that he went to the shop, 93, Kingston Road, on July 17, 1893, the name Cooper, Price and Co. was over the door; he saw a young man, whom he knew to be Percy Cooper, who served him with a pennyworth of laudanum in one bottle, and with twopennyworth of laudanum and twopennyworth of soap liniment in another. The bottles were not labelled, but he made another small purchase at the same time, on which the name of the firm appeared. He afterwards handed the bottles to Mr. Eastes, the analyst.

Ernest John Eastes, Fellow of the Institute of Chemistry, proved receiving the bottles from the last witness, and stated that he had found a preparation of opium in each bottle.

Mr. Grey then put in the Register of Pharmaceutical Chemists and Chemists and Druggists, and pointed out that defendant's name did not appear therein.

His Honour said that, in accordance with the evidence, judgment must follow for the plaintiffs, for the penalty with costs.

### BREACH OF THE EXPLOSIVES ACT.

Joseph Gilman, chemist and druggist, Corporation Street, Birmingham, was charged under the Explosives Act, before the magistrates on Friday, January 12, with keeping on his premises more than 15 lbs. weight of explosives, and also with keeping 2 lbs. of blasting powder, without having the necessary certificate of authorisation.

The inspector of explosives, Mr. F. J. Jarrett, stated that on January 1 he went to the premises of the defendant, and there found 229½ lbs. of explosives, or 214 lbs. in excess of the quantity defendant had authority to keep. The explosives were stored in casks and tea-chests. There were also 2 lbs. of blasting powder, which was in the shop with the other explosives.

The defendant pleaded guilty, and the magistrates fined him £20 and costs in the first case, and ordered him to pay the costs in the second.—*Daily Chronicle.*

### POISONING BY LAUDANUM.

At the Islington Coroner's Court, Dr. G. D. Thomas held an inquiry on Monday, concerning the death of Alice Frances Hawley, a nurse at the London Fever Hospital, Liverpool Road, N., who died there on Thursday last from the effects of opium poisoning. It was shown in evidence that the deceased had taken narcotics for two years, and had in her possession a box containing several small bottles labelled either "Chloral hydrate" or "Laudanum." Some laudanum still remained in one of the bottles.

Dr. Edgar O. Hopwood, resident medical officer of the institution, stated that he had no doubt that death was due to laudanum poisoning. Miss Hawley was not of an emotional, melancholic, or despondent temperament, and it was improbable that she intended to destroy herself.

In the result the jury returned a verdict of death from misadventure.—*Daily News.*

### POISONING BY HYDROCHLORIC ACID.

On Tuesday, January 9, an inquiry was held in the County Hall, Llangollen, before Mr. Wynne Evans, coroner, into the death of John Richard Jones, plumber, aged 54, of Church Street, Llangollen, who swallowed some hydrochloric acid on October 25 last, and died from the effects of the same on the morning of Sunday, January 7.

Mr. H. Davies-Jones, surgeon, said that, in reply to his question, Jones said he had swallowed about a quarter of a tumblerful of spirit of salt. The cause of death was ulceration of the stomach, caused by the poison he swallowed.

The jury unanimously returned a verdict to the effect that deceased took poison with the intention of destroying life, whilst temporarily insane.—*Llangollen Advertiser.*

### POISONING BY BICHROMATE OF POTASSIUM.

An inquest was held at the Somerset Inn, Yeovil, on Wednesday, January 10, before Mr. E. Q. Louch, coroner, touching the death of James Taylor, aged 50, of Addlewell Lane, Yeovil, a leather dyer, who poisoned himself on the previous day with bichromate of potash. Medical evidence as to the cause of death having been given, the jury returned a verdict of "Suicide whilst temporarily insane."—*Bristol Mercury.*

### POISONING BY CYANIDE OF POTASSIUM.

An inquest relative to the death of Mr. W. F. Sheppard, grocer, aged 77 years, who had taken some cyanide of potassium, was held on Thursday, January 11, by Mr. Hamley, county coroner, at Wadebridge.

After hearing the evidence, the coroner said it was evident deceased had poisoned himself, and the only question was the state of mind deceased was in when he did so.

The jury returned the verdict of "Suicide whilst temporarily insane."—*Western Morning News.*

### POISONING BY LAUDANUM.

An inquest was held on Monday, January 1, at the Police Court, Maryport, by Mr. Falcon, coroner for West Cumberland, to inquire into the death of Mr. Arthur Miller, organist at St. Mary's Church, who was found dead in bed at the Senhouse Arms Hotel, death being due to laudanum, a quantity of which the deceased had swallowed to ease neuralgic pain. The evidence seemed to indicate that an overdose had been accidentally taken, and the coroner was of opinion that the deceased did not get the laudanum with any intention of destroying himself. The jury returned a verdict of death from misadventure.—*Workington News.*

### POISONING BY ACETIC ACID.

Last week, Mr. Hicks held an inquiry at Lambeth respecting the death of Susan Wright, aged 79, lately residing at the Tabernacle Almshouses, 29, Elephant Road, New Kent Road. She had asked a friend to give her some medicine, pointing out where it was placed. The visitor went to the sideboard and got a small phial. Mrs. Wright poured the contents into a wineglass and drank the liquid. She was immediately taken ill, and it transpired that the phial had contained acetic acid. The old woman died next day from the effects of the poison. A verdict of "Death by misadventure" was returned.—*Lloyd's Weekly Newspaper.*

### POISONING BY STRYCHNINE.

An inquest was held by Mr. A. H. Hebbert at the New Inns, Acock's Green, on January 12, upon the body of Samuel Biscoe, aged 67 years, of Station Road, Acock's Green, who died on Wednesday from the effects of Battle's vermin killer, which he had purchased from Mr. Frost, chemist, stating that he wanted it to kill mice.

Mr. Rosten, surgeon, said that Battle's vermin killer contained strychnine, and Biscoe's death was due to the action of that poison.

The jury returned a verdict of "Suicide whilst temporarily insane."—*Birmingham Gazette.*

### POISONING BY CARBOLIC ACID.

Investigations are at present being made by the Public Health Committee of Edinburgh Town Council into the death, by accidental poisoning, of a young woman employed as a servant at the Fever Hospital. About six weeks ago Helen Swan, the servant in question, who had been suffering from indigestion, was recommended by the lady superintendent to take a dose of salts. The instruction regarding the medicine had been given to the night superintendent, who had been informed that she would receive from one of the nurses a dose of a certain description of salts in solution. Next morning the night superintendent called upon the nurse to whom she had been directed, and received from her the liquid in a tumbler. Carrying it to the room where the attendants were sitting down to breakfast, she gave it to the girl, who immediately drank it off. No sooner were the contents of the tumbler swallowed, when the girl placed her hand on her mouth. The nurse, thinking that the nauseous taste offended her, offered her some tea to drink. Almost at the same moment traces of the acid were observed on the girl's lips, and then it flashed upon the superintendent that the wrong medicine had been administered. Medical aid was summoned, but the efforts to counteract the influence of the poison were futile, and in a very short time the girl died. Soon afterwards it was discovered that the girl had been given carbolic acid instead of salts. The nurse had inadvertently lifted the wrong bottle. When inquiries came to be made, it transpired that no one could explain how the acid came to be where it was. It is supposed to have been brought in by some private patient. The mother of the unfortunate girl has made a claim upon the city for damages. The Procurator-Fiscal has forwarded a report to the Crown authorities, who, after due consideration, have decided that, the death having been purely accidental, no further steps should be taken, but have, at the same time, suggested to the committee the desirableness of every effort being made—in the event of the present arrangements admitting of still further measures of precaution—to minimise the chance of an accident of the kind occurring in future.—*Edinburgh Evening News.*

Mr. Theodore Hoyle, on Saturday last, held an inquest upon the body of Elizabeth Margaret Hall, 19 years of age, who resided with her parents at 8, Wesley Street, Shieldfield, and died after drinking carbolic acid. The jury found that the deceased had committed suicide whilst in a despondent state of mind.——A similar verdict was returned at the inquest which followed, concerning the death of Jane Thomas, also 19 years of age, whose death was due to the same cause.—*Newcastle Daily Journal.*

On Monday last, Dr. G. Danford Thomas held an inquest at the Hornsey Coroner's Court on the body of Edith Augusta Showler, the daughter of an independent gentlemen residing at 42, Sydney Road, Hornsey. She suffered from insomnia, and on the previous Friday was found to have taken carbolic acid, from the effects of which she died. The jury returned a verdict of suicide while of unsound mind.—*Morning Post*

### POISONING BY OPIUM.

An inquest was held at the Angel Hotel, North Walsham, on Monday evening, before Mr. W. M. Barton, on the body of Elizabeth Crane, spinster, of that town, who died as the result of taking six pills, containing 30 grains of opium.

John Shepheard, M.R.C.S., of North Walsham, stated that he found deceased in a state of insensibility; the signs were those of narcotic poisoning. She died from coma, brought on by opium poisoning.

David Dulley, of Cromer, chemist and druggist, stated that he knew the deceased. She was a customer of his, and was in the habit of buying opium. She never came for it herself; sometimes a messenger would come for a box, and sometimes her nephew came. He did not know that it was for her. He supposed it was for her mother. The three boxes produced were sold by him. Each box contained two dozen pills. There were 5 grains in each pill. They were ordered by the doctor for Mrs. Crane, the mother of the deceased, in order that she might take a regular quantity each day. He had sold the pills to her for the past eighteen months. He sold her an extra quantity just before she left Cromer. He did not know that the deceased was in the habit of taking them. The pills were for Miss Crane to give her mother a proper dose.

John Smith, of Kensington, retired wine merchant, gave evidence as to the deceased's state of mind. His opinion was that her mind was unhinged.

The coroner having summed up the evidence, the jury deliberated in private, and ultimately returned a verdict "That the deceased died from the effects of opium administered by herself while in an unsound state of mind."—*Eastern Daily Press.*

## Reviews and Notices of Books.

ANATOMISCHER ATLAS DER PHARMAKOGNOSIE UND NAHRUNGSMITTELKUNDE. Lieferungen 1 and 2. Von Dr. A. TSCHIRCH und Dr. O. OESTERLE.*

The 'Pharmacognostical Atlas' now being published in parts by Professor Tschirch and Dr. Oesterle forms, in point of fact, the second volume of Professor Tschirch's 'Applied Plant Anatomy,' which appeared in 1889, and deals mainly with the anatomical structure of the principal drugs and food stuffs. One of the aims of the authors is to train men to be skilled microscopists and anatomists, and the work appears admirably adapted to realise that aim. The student first makes himself acquainted with the morphology of a drug, and its appearance under the lens, proceeds then to investigate its structure as revealed to him by cutting sections or by other suitable treatment, devoting special attention to special structures, and finally examines the powdered drug for diagnostic characters. Each drug is illustrated by a plate containing, on an average, perhaps, twenty-five separate drawings, accompanied by sufficient, but not too voluminous, text. The illustrations include the appearance under the lens, sections in various directions, particular organs and structures in detail, and, if considered desirable, other stages in the development of the drug, both prospective and retrospective. To facilitate the identification of the various layers into which a fruit, seed, leaf, or flower may be separated, surface views of these structures are shown in the succession in which they actually occur. In this latter arrangement it is hoped that the work will enable the pharmacist to ascertain the identity and purity of drugs and food stuffs.

The Atlas will doubtless prove indispensable to the student of the anatomy of drugs; he will find the arrangement of tissues in their natural successive positions of great assistance. Exception must, however, be taken to the opinion expressed in the preface that this arrangement will enable the microscopist to identify with accuracy powdered drugs by the illustrations alone. There can be no doubt that the innate labour-saving tendency of the student will alone work sufficient mischief in inducing him to substitute ready-made illustrations for what should be the result of his own work, thus not only neglecting his education, but accepting with the work of others their errors also. Moreover, these tissues can hardly be identified properly by this means when the scale of magnification is omitted, as it unfortunately is here. It is doubtful also whether the fragments found in powdered drugs will present the appearances shown in the plates, except to a small extent.

Under "Powder" in the article "Senna" appears the statement that "in every powdered Alexandrian senna, and in the drug as well, occasional argel leaves and cassia seeds are to be found." The inference that any powdered senna, not containing argel leaves and cassia seeds, is to be regarded with suspicion, might place a conscientious pharmacist who supplied a powder of picked Alexandrian leaves under a most unpleasant and unjustified stigma. Apart from the question of accuracy of statement, it surely is illogical to regard the presence of an accidental and removable impurity as a necessary characteristic of the genuine drug. Examination of the anatomy of the woody cylinder of ipecacuanha root shows that the cell-forms present may be far more varied than the plate would lead one to expect. Again, there is no necessity for coining a new name for the sclerenchymatous cells which are found in the primary bark of certain cinchonas, nor is the name (libro-sclereids) happily chosen; a cell which has nothing whatever to do with the liber should hardly be christened after that tissue simply because it possesses in common with certain other cell forms left-oblique split pores; and the researches of Van Tieghem and Morot have shown that the so-called "primary bast fibres" have no claim to that name.

It will be gathered from these remarks that the Atlas of Professor Tschirch and Dr. Oesterle is a work to be critically studied rather than unhesitatingly accepted. It will, however, form an indispensable basis for other workers. The richness of detail in the plates, and their technical execution, are all that could be desired. Nor is the fact that the work is published in German so serious a disadvantage to the English reader as might be imagined, the language being simple and the technical expressions easily understood. There are to be from sixteen to twenty parts, each containing five plates with letterpress description, and they are offered at an extremely moderate price, which cannot be regarded as at all commensurate with the cost of production.

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* London: Williams and Norgate. Each part 1*s.* 6*d.* net.

## Obituary.

Notice has been received of the death of the following:—

On January 6, William Mather Nobbs, Chemist and Druggist, of Bowes Park, N. (Aged 76 years.)

On January 7, Arthur Molyneux Wilkinson, Chemist and Druggist, of Hemel Hempstead. (Aged 28 years).

On January 9, Thomas Jones, Chemist and Druggist, of Bala. (Aged 79 years). Mr. Jones had been a member of the Society since 1869.

On January 11, Thomas Gilks Gibbons, Pharmaceutical Chemist, of Manchester. (Aged 75 years). Mr. Gibbons was a former member of the Society, having joined in 1864. He took an active part in local politics, and was a prominent Freemason, being G. J. Warden of his Province.

On January 11, Roderick Urquhart, Chemist and Druggist, of Edinburgh.

On January 11, John Cross, Chemist and Druggist, of Holloway Road. (Aged 53 years).

On January 15, James Hart, Pharmaceutical Chemist, of Bolton. (Aged 65 years). Deceased had been in business in Bolton for over thirty years, and was highly respected by his fellow townsmen. He was a member of the Society for many years.

## Correspondence.

### Adeps Lanæ.

Sir,—I entirely concur in the opinions expressed in your article on the above subject. If one starts with the proper kind of wool-fat it is not difficult to prepare a good adeps lanæ hydrosus without the use of alkali or centrifugal machine. This is said with some experimental knowledge of the question. There is nothing novel in the use of wool-fat as an unguent, and nothing novel in the addition of water thereto; and if no novelty, then no validity of patent. It appears to me that lawyers, however eminent, are not good judges of scientific questions. Everyone must have noticed that even in such comparatively simple cases as prosecutions under the Pharmacy Acts and the Sale of Food and Drugs Act, county court judges and sheriffs have often great difficulty in comprehending the point at issue. It is therefore not at all surprising that in the complex question of patents, both English and Scotch, superior courts have a tendency to float out to sea. Would it not greatly aid a right judgment if the court were supplied with a report by a commission of experts who had previously taken all necessary evidence?

*Musselburgh.* D. B. Dott.

## Notices of Meetings next Week.

### Monday, January 22.

*London Institution*, at 5 p.m.
"The Roman Wall in Northumberland," by T. Hodgkin.

*Imperial Institute*, at 8 p.m.
"The British Empire as a Geographical and Commercial Unit," by E. G. Ravenstein.

*Society of Arts*, at 8 p.m.
"The Detection and Measurement of Inflammable Gas and Vapour in Air," by Professor Clowes.

### Tuesday, January 23.

*Gresham College*, at 6 p.m.
"On the Organs of Touch," by Professor E. Symes Thompson.

*Sheffield Microscopical Society*, at 8 p.m.
"Foraminifera," by Dr. Gordon.

*Photographic Society of Great Britain*, at 8 p.m.
"Lantern Slide Processes."

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (second lecture), by Professor Stewart.

*Society of Arts*, at 8. p.m.
"Morocco," by Captain Rolleston.

### Wednesday, January 24.

*Western Chemists' Association* (*of London*), at 9 p.m.
Discussion on "Affiliation of Pharmaceutical Associations."

*Imperial Institute*, at 8 p.m.
Ladies' Concert.

*Society of Arts*, at 8 p.m.
"American Carriages," by G. H. Thrupp.

*Gresham College*, at 6 p.m.
"On the Sense of Touch, by Professor E. Symes Thompson.

*Pharmaceutical Society, North British Branch*, at 8.30 p.m.
"A Preparation of Iron," by D. B. Dott.
"The Standard of Temperature for Specific Gravity," by D. B. Dott.
"Chloroform," by D. B. Dott.
"Papain Digestion, with notes on Papain," by Dr. Gordon Sharp.
"Additions to the Museum," by J. Rutherford Hill.

### Thursday, January 25.

*School of Pharmacy Students' Association*, at 7 p.m.
"Molybdenum and its Reactions," by A. Lander.
"Report on Analytical Chemistry," by R. H. Jones.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Fifty Years of Pharmacy," by Dr. J. B. Nevins.

*Chemists' Assistants' Association*, at 8.30 p.m.
"A Suggested Code of Pharmaceutical Ethics;" discussion to be opened by E. H. Gane.

*Imperial Institute*, at 8 p.m.
"Canada for Tourist and Sportsman," by Archer Baker.

*Liverpool Chemists' Association*, at 8 p.m.
Annual Meeting. Council Election, miscellaneous business, and Inaugural Address by the President.

*Gresham College*, at 6 p.m.
"On Touch in Health and Disease," by Professor E. Symes Thompson.

### Friday, January 26.

*Gresham College*, at 6 p.m.
"On Touch in Health and Disease," by Professor E. Symes Thompson.

### Saturday, January 27.

*Pharmaceutical Football Club v.* Willesden, at Shepherd's Bush, at 3 p.m.

## Books, etc., received.

Spinal Curvature: description of a new form of apparatus for the spine. By C. G. Gümpel. Pp. 12. London: T. Pettit and Co. From the Author.

Annual Report of the Imperial Institute for 1893. Pp. 40. London: Waterlow and Sons, Limited. From the Executive Council.

Anatomischer Atlas der Pharmakognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lieferung 2. 5 Plates—Cocoa, Senna, Liquorice, Cinchona, Ipecacuanha—with descriptive letterpress. 1*s*. 6*d*. net. London: Williams and Norgate. From the Publishers.

Official Guide to the Museums of Economic Botany, Royal Gardens, Kew. No. 3, Timbers. Second edition, revised and augmented. Pp. 98. 3*d*. London: Eyre and Spottiswoode. From the Director.

Practical Cookery Book. By H. M. Young. Pp. 104. 1*s*. London: Liebig's Extract of Meat Company, Limited. From the Publishers.

Do You know it? A book of reference for newspaper and other readers. By C. E. Clark. Pp. 148. 6*d*. London: Saxon and Co. From the Publishers.

Prospectus of the Agricultural Department of the University College of Wales, Aberystwith, Session 1893-94; with Report on Experimental Manuring, by J. Alan Murray, B.Sc., Assistant Lecturer in Agricultural Chemistry, and Syllabus of the Summer Vacation Classes, August, 1894. From the College.

Communications, Letters, etc., received from Messrs. Chapman, Jones, Knight, Robinson, Robson, Stephenson.

## PRACTICAL PHARMACOGNOSY.

*(Continued from page 402.)*

### Cell-contents and Isolated Structures.

### *Starch.*

Starch is probably the most important substance found amongst the contents of vegetable cells, and a practical acquaintance with its characteristic forms and reactions is an absolute necessity in the study of the histology of drugs. It may occur in almost every part of plants, being the most abundant and universally distributed of non-proteid reserve food materials, but is most common in parenchymatous tissues. In the stems of dicotyledons it occurs chiefly in the parenchyma of the middle and inner barks, and in the cells of the medulla and medullary rays, whilst a similar distribution is found in the roots. Succulent stems and roots contain it in the xylem of the fibro-vascular bundles, and it sometimes occurs in laticiferous vessels, ducts, and tracheids.

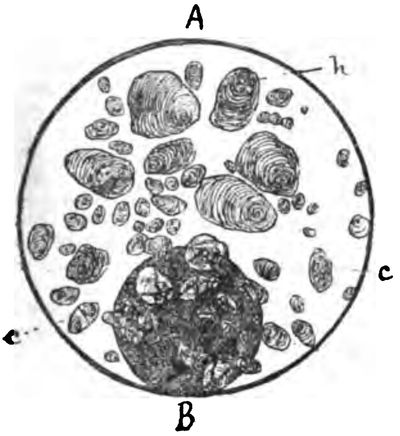

Fig. 1.—Potato starch as examined by (A) ordinary light, and (B) polarised light; *h*, hilum, *cc*, compound grains. (x150)

The granules of which starch consists are organised structures, of varying shape and size, exhibiting a more or less distinctly stratified appearance. Young granules appear to be almost invariably spherical, but, as they increase in size, they become lenticular, ovoid, or polygonal. The layers of which the grains consist are arranged around a nucleus or hilum, which may occupy a central position, but is more commonly situated towards one side or end of the grain.

The starch grains of the potato are perhaps, on account of the comparatively large size they attain, the best to study in the first instance. If a fresh tuber be cut the sap will exude from the cut surface. A drop of this should be transferred to a drop of distilled water which has previously been placed upon a glass slide, and the whole covered with a clean cover-glass. On examination (first with a ⅔-in. and then with a ⅙-in. objective) the grains will be seen to be ovoid in shape (Fig 1), colourless, and highly refractive. The nucleus, usually seen as a bright point, will be found towards one end of the granule, and the rings surrounding it appear very distinct, particularly if the light be cut off to some extent by means of the diaphragm. If now a drop of dilute potash solution be placed at the edge of the cover-glass, as it acts upon the starch the stratification will first become much more distinct and then shortly disappear, the grains meanwhile increasing in size. The action of the reagent may be accelerated by applying a piece of filter paper at the opposite side of the cover-glass to that at which the potash solution is placed. Iodine solution applied in the same manner, after passing water under the cover-glass, will turn the swollen starch blue, the colour gradually deepening as the action of the reagent proceeds, but this test, which is the most characteristic one for starch, is best applied to a fresh specimen.

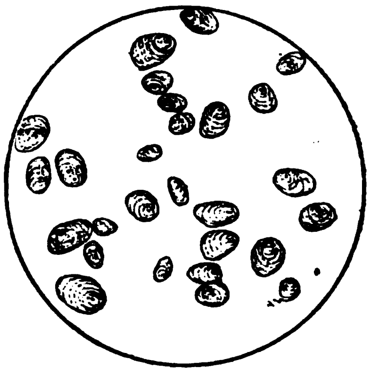

Fig. 2.—Bermuda arrowroot. (x150)

In arrowroot starch (Fig. 2) the stratification is almost as distinct as in that of potato, and the grains somewhat resemble those of the latter in appearance, though smaller generally and more uniform in size. Wheat starch (Fig. 3) consists of circular, flattened grains, varying much in size, with central nucleus, and stratification very difficult to distinguish.] The starch of maize (Fig. 4) is smaller, sharply angular, and shows a central cleft, without distinct stratification. Rice starch (Fig. 5) is still smaller and also angular in shape.

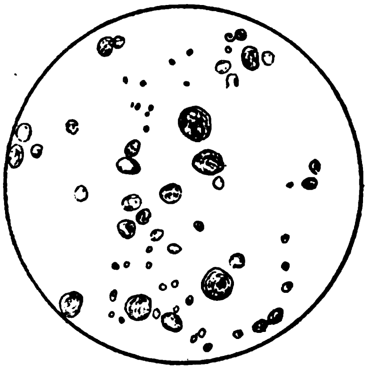

Fig. 3.—Wheat starch. (x150)

The hilum is semilunar or radiate in calumba, arrowroot, and maize starches; in the bean and other leguminous seeds it forms a broad, longitudinal cleft; and rye starch shows distinct cracks. Compound grains are sometimes found, as in the oat, potato, and sarsaparilla, but, by pressure, they can be split up into their component granules. Starch is doubly refractive, and when viewed by polarised light, each granule displays a black cross (Fig. 1 B), the arms of which intersect at the hilum. This and other polarising effects disappear when the layers absorb or lose water.

In composition, starch is supposed to consist mainly of granulose (90 to 95 per cent.), which is soluble in water, gives the blue colour with iodine as described, and can be extracted by saliva or dilute acids. The external coating of the grains, however, appears to be formed of starch-cellulose, which differs from ordinary cellulose in being insoluble in cuprammonia, prepared by dissolving freshly precipitated cupric hydrate in strong ammonia solution. Starch-cellulose is coloured brown by iodine, as is seen by treating dry starch with iodine vapour or with the same reagent dissolved in anhydrous alcohol or chloroform. The characteristic blue coloration of the grains is only produced in the presence of water, which enables the iodine to penetrate the cellulose coating and thus come in contact with the granulose.

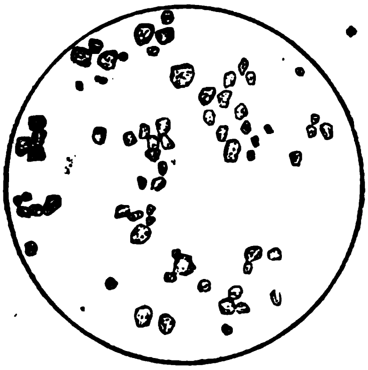

Fig. 4.—Maize starch. (x150)

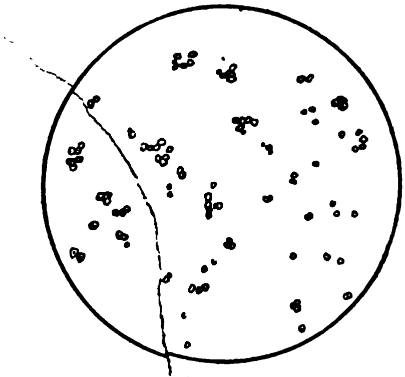

Fig. 5.—Rice starch. (x150)

When slowly heated in water, starch grains swell and a paste is formed which gives the same reaction with iodine as unaltered starch. Solutions of various compounds, such as calcium chloride, zinc chloride, dilute chromic acid, etc., cause a similar swelling of the grains to potassium hydrate, water being absorbed, and the stratification temporarily rendered more distinct. In the case of starch grains which possess no evident stratification, the rings may thus be demonstrated, though they disappear rapidly and entirely as the grains swell. A similar disappearance occurs on applying alcohol, which abstracts water from the starch. Cuprammonia also causes swelling and colours the grains blue, without effecting the change into paste.

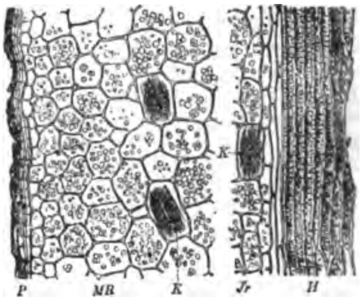

Fig. 6.—Longitudinal section of ipecacuanha root, showing needle-shaped crystals or raphides. (x150) After Vogl.

The reactions described should be confirmed with as many varieties of starch as possible, distilled water or very dilute glycerin being employed as a temporary mounting medium. Each kind of starch should also be measured by means of an eye-piece micrometer, and the linear diameter of the largest and smallest grains of each separately recorded in micra (μ) or micro-millimetres, besides which sketches of typical forms should be made in a note-book.

*Crystals.*

Of the compounds assuming crystalline shape in plant tissues, calcium oxalate is the most widely distributed. Needle-like crystals (raphides) of this occur in the bulbs of squill, sarsaparilla and ipecacuanha roots (Fig. 6), white hellebore rhizome, cusparia bark, and guarana; prismatic crystals (various) in hyoscyamus (Fig. 7) and coca leaves, quillaia bark,

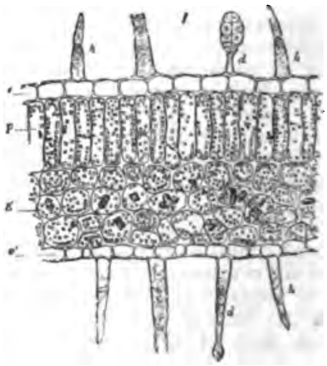

Fig. 7.—Section of hyoscyamus leaf, showing prismatic crystals. (x150) After Vogl.

quassia wood, orris rhizome, calumba and liquorice roots; cluster crystals or rosettes in stramonium (Fig. 8) and jaborandi leaves, rhubarb and jalap roots, canella and cascarilla barks, cusso, and black hellebore rhizome; both prisms and rosettes in senna and eucalyptus leaves, cascara sagrada and oak barks; pulverulent crystals in the leaves and root of belladonna, and leaves of tobacco. These crystals appear generally to be enclosed in an integument which remains behind, retaining the shape of the crystals, after the oxalate is dissolved by means of acid, and may be stained by methyl green.

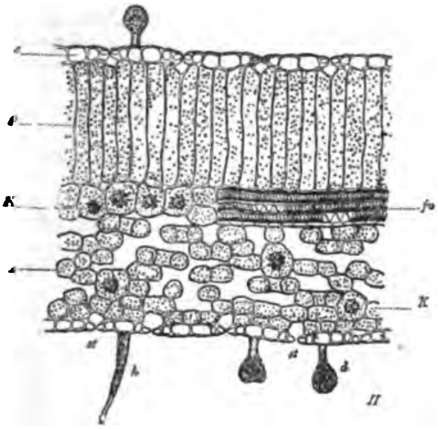

Fig. 8.—Section of stramonium leaf, showing cluster crystals or rosettes. (x150) After Vogl.

Calcium oxalate, if present, may be identified by the crystals remaining unaltered when sections containing them are treated with potash solution or acetic acid, and dissolving without effervescence in hydrochloric acid, the resulting solution yielding an abundant precipitate of calcium oxalate on adding potassium acetate. Sulphuric acid also dissolves the oxalate crystals, and the calcium sulphate thus formed may crystallise out, if the quantity of surrounding fluid is insufficient to hold it in solution.

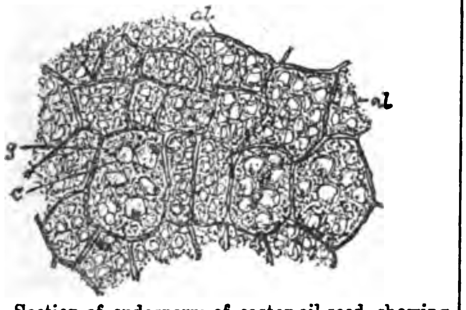

Fig. 9.—Section of endosperm of castor oil seed, showing crystalloids, *c*, aleurone grains, *al*, and globoids, *g*. (x400)

Of the other compounds that may occur in a crystalline state, calcium carbonate forms cystoliths in certain leaves, but dissolves with effervescence in acids; calcium phosphate gives a characteristic yellow colour with dilute neutral solution of silver nitrate; and calcium sulphate is soluble in water. Crystals of organic compounds, such as asparagine, picrotoxin, and piperine, may also occasionally be found in drugs, having been formed during the drying process.

Crystalloids are protein bodies having the form of crystals, but their angles are inconstant. They are found in the cells of the endosperm of the castor oil seed (Fig. 9), together with aleurone grains and globoids, are coloured brown by iodine, dissolved by dilute potash solution, and swell in water.

### *Spores.*

Lycopodium consists of the microspores of *Lycopodium clavatum*, L., which, when magnified, appear as tetrahedral granules (Fig. 10). Each of these is about 25μ in diameter, and is seen to consist of a triangular pyramid, resting upon a somewhat convex base. The faces of the granules are marked by minute ridges, and these, by their intersections, form regular five- or six-sided meshes. Slight elevations are also produced at the points of intersection, giving the granules a speckled appearance, when examined with a low magnifying power. The yellowish membrane below the network is not ruptured by the action of boiling water or potash, nor coloured blue by iodine, and strong sulphuric acid does not affect it, though it penetrates the grains and renders them transparent, while causing drops of oil to exude. A specimen should be examined in a mixture of spirit and water, and sketched. Various pollen and starch grains used as adulterants are readily distinguished by their shape, and starch is also indicated by the iodine reaction; whilst inorganic admixtures such as calcium sulphate and magnesia are totally different in appearance to lycopodium.

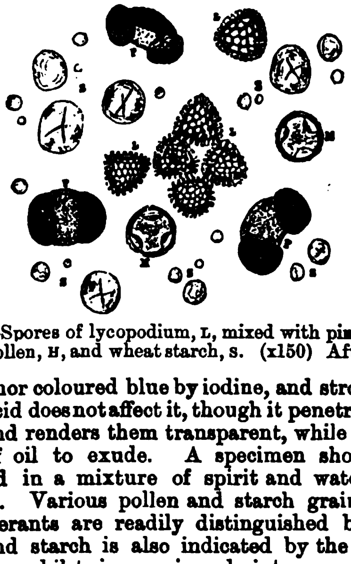

Fig. 10.—Spores of lycopodium, L, mixed with pine pollen, P, hazel pollen, H, and wheat starch, S. (x150) After Vogl.

### *Glands.*

Lupulin is found covering the fruits, as well as the axis and base of all leaf-like organs of the hop. It consists of shining, translucent glands (Fig. 11) which are globular or ovoid in shape, and measure from 140 to 240μ in diameter. These glands are thin-walled sacs, composed of two distinct and nearly hemispherical parts. The part originally attached by a stalk to the plant is built up of tabular polyhedric cells, whilst the upper, and larger, hemisphere has a thinner delicately marked membrane. The oleo-resinous contents of the glands fill and distend them when fresh, but, on drying, the liquid contracts and forms a central mass, thus causing the membrane to collapse and vary considerably in form. On warming lupulin in glycerin the walls of the glands burst, and the contents are expelled in minute drops. The yellow colouring matter of the walls may be extracted by means of ether, and more readily from the thicker membrane than from that covering the larger hemisphere.

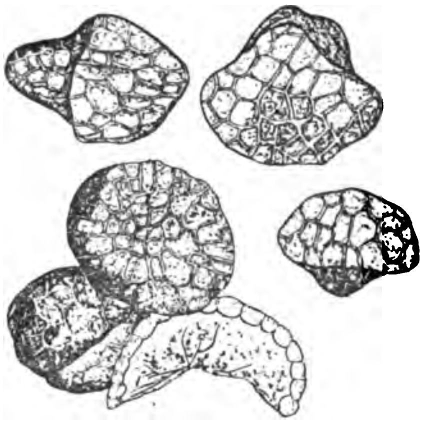

Fig. 11.—Lupulin, the glands of hop. (x125) After Moeller.

Kamala is a mixture of transparent reddish glands and grey stellate hairs (Fig. 12), with fragments of leaves and other foreign matter. The former are irregularly spherical, 50 to $60\mu$ in diameter, have a wavy surface, and are somewhat flattened on one side. The yellowish enveloping membrane encloses a mass of similar colour, and in this are seen numerous club-shaped cells, which contain a transparent reddish resinous substance, soluble in alcohol or ether. The cells diverge in a radiate fashion from a small cell in the centre of the flattened side of the gland. By exhausting the glands with alcohol and potash, and then breaking them up by pressure, the cells can be separated, and, after treating them for some time with sulphuric acid and iodine, the walls acquire a more or less brown or blue colour, being thus shown to correspond with cellulose. The enveloping membrane, however, is not so coloured by this treatment. The thick-walled stellate hairs are usually two or three times as long as the glands, and often contain air. Kamala may be adulterated with earthy substances or with foreign vegetable matter, such as the remains of capsules, leaves, etc., but the characteristic appearance of the glands suffices to distinguish them without difficulty.

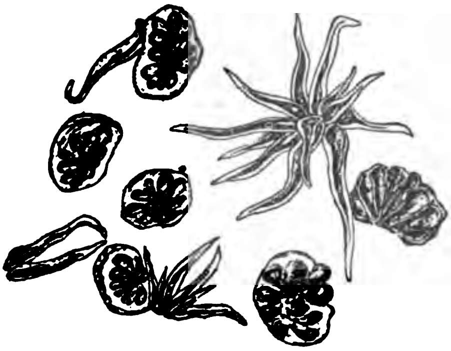

Fig. 12.—Kamala. Glands and hairs. (x125) After Moeller.

## THE COLOURING OF PEAS AND PRESERVED VEGETABLES WITH COPPER.

The application of copper compounds for various purposes, such as the destruction of germs of parasites injuriously affecting cultivated plants, and for giving a bright green colour to preserved vegetables, has raised questions as to whether the useful effects thus produced may not be attended with disadvantage in rendering the produce unfit for use as food. In regard especially to the colouring of preserved vegetables, such as peas, very opposite opinions have been expressed on this subject, but they have been to a very great extent based rather upon theoretical considerations than upon evidence of fact. The subject, however, is one of such importance—from a hygienic point of view—as to merit careful investigation.

In order to arrive at a satisfactory conclusion in regard to the influence of copper upon articles of food, Professor Tschirch has directed his attention to the inquiry, and has recently published a monograph, dealing in a very thorough manner with the several questions involved. Attention is especially directed to the three following points :—

Is copper absorbed by plants from the soil and by their leaves?

In what form does copper exist in plants which have been dressed with copper compounds and in preserves treated with copper salts?

Whether and to what extent copper compounds are deleterious to the animal organism?

In studying these questions, the literature of the subject has been very carefully examined and referred to in foot-notes, so that recorded facts and opinions have received due attention, and the original publications can be consulted if necessary. The first division of the work is sub-divided into five sections, the first dealing with the occurrence of copper in articles of food, drugs, etc. It is there shown that copper is very frequently met with in mineral waters, in wine, olive oil, cereals, cocoa and other vegetable products, as well as in liquorice root, cinchona bark, cardamoms, black pepper, opium, etc. Its very general occurrence in plants was first pointed out by Meissner and John, while Devergie and Orfila showed that it is not less frequently met with in the animal kingdom. Professor Tschirch considers that whatever doubt may attach to some of the statements in this respect, it is certainly true that copper does occur in minute amount in many instances. It does not follow that copper is to be regarded as a normal constituent of either plants or animals. The case of turacin, containing from 5 to 8 per cent. of copper, is probably an exception, and that may also be true in regard to the copper in some of the lower forms of animal life, where the copper albuminate, named by Fredericq hæmocyanin, appears to perform a respiratory function similar to that of hæmoglobin.

The second section of this part of the work deals with the assimilation and storing up of copper by plants and animals. Considerable differences of opinion exist as to the power of plants to assimilate copper, and Professor Tschirch's experiments with wheat and potatoes are decidedly in favour of their being able to do so, when the soil in which the plants grow is watered with cupric sulphate. A similar absorption was found to take place through the epidermis of the leaves. Cultivated soil almost always contains some copper. In animals and in parts of the human body copper also occurs in minute and varying amounts, especially in the kidneys, bile, liver, and the blood. Under ordinary conditions of life the presence of copper is so ubiquitous that it cannot be excluded, and as there is a possibility of the presence of copper in all kinds of food materials, it is inevitable that a certain amount of it must be daily introduced into the human organism. However small the quantity, it will be stored up in the liver, although it is again excreted, to some extent, by the bile and kidneys.

Passing then to the artificial coppering of preserved vegetables, treated of in the third section, it is shown that although the bright green coloration produced by boiling vegetables in copper vessels has long been observed, little application of this fact was made until the system of preserving vegetables by sterilising was introduced. It was then found that unless copper salts were used the vegetables had a faded appearance. In Professor Tschirch's investigation of chlorophyll he ascertained that this discoloration results from separation of brown phyllocyanic acid and formation of chlorophyllan under the influence of the vegetable acids present. He also showed that its prevention by the use of copper salts is due to the formation of a permanent chlorophyll compound—a copper salt of phyllocyanic acid ($C_{24}H_{28}N_2O_4$)—which is very closely related to chlorophyll, and probably exists as a compound in the chlorophyll of leaves; but differs from most other chlorophyll compounds in not forming a fluorescent solution. In any case it is separated from chlorophyll by all acids, even carbonic acid. The copper salt of this acid has a fine green colour. It is not soluble in water, but dissolves in strong alcohol, chloroform, or caustic alkalies. The formation of this salt can be shown by immersing a leaf of *Ampelopsis hederacea* in water, to which some cupric sulphate has been added, and boiling after the leaf has become saturated. The leaf will then remain green, while if boiled with water it would rapidly become brown in consequence of the elimination of phyllocyanic acid by the vegetable acids present in the leaf. After washing away the cupric sulphate, the phyllocyanate can be dissolved out of the leaf by alcohol, and on evaporating the solution with strong hydrochloric acid, no blue phyllocyanin is extracted. The alcoholic solution of unaltered chlorophyll, on the contrary, when evaporated and the residue treated with hydrochloric acid and water, gives a deep blue solution of phyllocyanin and a residue—dissolving in ether with brownish yellow colour—containing xanthophyll and phylloxanthin, together with fat and cholesterin. If dilute hydrochloric acid is used to act upon the alcoholic extract, ordinary chlorophyll becomes yellow in consequence of the formation of phyllocyanic acid; but the extract from plants which have been treated with copper remains green. This is the best criterion, whether treatment with copper has been applied or not. The formation of the copper salt of phyllocyanic acid in peas when treated with copper solution may be ascertained by extracting the peas with strong alcohol, when a solution is obtained showing the spectrum of copper phyllocyanate. This solution does not give a deposit of copper when a sheet of iron is immersed in it, and when evaporated with water and hydrochloric acid it does not give up copper; but the presence of copper can be detected after incineration. It is remarkable that phyllocyanic acid (set free by acid plant juice) has so great an affinity for copper that it displaces sulphuric acid from cupric sulphate, although it is so feebly acid that it is eliminated from chlorophyll even by carbonic acid. The results of Professor Tschirch's experiments show that this copper salt of phyllocyanic acid is always formed when peas, beans, or gherkins are treated with a copper solution, but that it is not the only copper compound formed under those conditions. On extracting preserved peas with alcohol until colourless, an appreciable quantity of copper was found in the residue. In the case of over-coppered peas the greater part of the copper remained, and only one-fourth to one-third of the whole quantity was extracted in the form of phyllocyanate. In the colouring of peas this salt is first formed, and if the treatment with copper solution is excessive, compounds of copper with albuminous substances are formed, probably also copper salts of fat acids, and it is in these forms that the copper exists which is left after extraction with alcohol. But when the colouring has been properly conducted the whole of the copper is combined in a condition insoluble in water, and the liquid surrounding the peas, etc., does not as a rule contain any appreciable quantity of copper, or at the utmost a mere trace. This fact is accounted for by the great insolubility of the compound of copper with phyllocyanic acid, even in acetic or hydrochloric acid.

In reference to the hygienic question of the influence of copper in preserved vegetables, Professor Tschirch considers that, apart from the fact of from ·02 to ·05 of copper being supplied by all food materials per kilogramme of body weight, and without considering the very large consumption of preserves coloured with copper without any authenticated case of poisoning being known of, it is impossible to exclude copper altogether from our daily food. He therefore thinks it better to meet the case of colouring with copper by establishing a maximum limit of the amount that may be present in preserved vegetables, etc.

The use of copper compounds for protecting crops from the attacks of parasites has been found so useful by wine growers, and for the wheat and potato crops, that its beneficial effects must be allowed to outweigh any ascertained possibility of injurious consequences that are to be feared from the consumption of plants grown under such conditions. As to the hurtful contamination of food by the use of copper vessels for cooking purposes, it appears to be merely a question of cleanliness that is involved, and if sufficient attention is paid to that condition, the use of copper cooking utensils is free from danger.

In carrying out the inquiry as to whether copper is to be regarded as a poison, Professor Tschirch had the assistance of the late Dr. Demme, of Berne, and Dr. Lange. Both have died before the investigation was completed, and this part of the subject has therefore been only partially dealt with. So far, however, as the experiments have been carried, it has been possible to arrive at the conclusion that copper is a poison, with the limitation that it has seldom been the cause of death, though it may produce more or less severe toxic symptoms when administered in large doses, and does not cause vomiting. In this respect it appears to be unimportant what copper compound is administered, for even the phyllocyanate, which is insoluble in hydrochloric acid, has been found as detrimental as the most soluble copper salt. Nevertheless, copper compounds cannot be regarded as poisons in the same sense as compounds of arsenic, lead, mercury, or phosphorus, because with stoppage of their administration, their abnormal effects upon the organism soon disappear, and the normal condition is restored.

On the question whether the human subject is susceptible of chronic poisoning by copper, opinions are very opposite. The evidence recorded in the case of copper workers is conflicting. Full consideration of all the circumstances leads to the conclusion that chronic poisoning of animals does not occur, and that the small amounts of copper naturally present in articles of food, or intentionally added to them, are without any deleterious effects, since the periodical supply of copper is compensated for by the continuous excretion of the metal in the bile and urine, so as to prevent pernicious accumulation in the liver or other organs. However, Professor Tschirch desires to be understood as thinking that the question as to chronic poisoning by copper is not fully determined, and that much observation is requisite to reconcile and explain the discrepancies of opinion which still prevail.

In regard to the more limited question of the colouring of preserved vegetables, it is to be remembered that the object in view is merely one of the gratification of taste. The quality of preserved peas is not in any way improved by colouring, neither is the keeping capacity augmented. It is only the appearance that is improved and made more agreeable. From the hygienic point of view it has to be considered whether the use of copper compounds—whose deleterious influence, though slight, is unquestionable when they are administered in sufficiently large doses—is admissible in the preparation of articles of food. It is mainly on the ground that copper cannot be excluded that Professor Tschirch thinks it would be advisable to accept this situation and be content to establish a limit beyond which the presence of copper in articles of food should not be allowed.

At the same time, it would be necessary to establish an efficient control of artificial coloured preserves, and it is only under conditions where there is adequate provision for such a control being effectually carried out that the view above indicated would be admissible. The recognition of colouring without such conditions must be regarded as questionable; while, on the other hand, it would be an exaggerated caution to prohibit altogether the use of copper compounds for dressing seeds and plants, etc., from which food materials are to be produced.

This view of the matter raises the question as to the amount of copper that is admissible. This varies from one part in ten thousand to one in forty thousand. A medium proportion is considered by Professor Tschirch to be unobjectionable, and to allow sufficient latitude to manufacturers. In connection with this point, it is to be remembered that in ordinary diet the daily quantity of copper taken into the system in the form of bread, meat and vegetables amounts to about one milligramme.

## ADVERTISEMENTS OF PATENT MEDICINES AND QUACK REMEDIES.

Mr. Ernest Hart delivered a lecture at Toynbee Hall, on Saturday night last, on the responsibilities of English journalism, dealing especially with the advertisements of patent medicines and quack remedies. He said that everyone must recognise the ability with which the great papers treated questions of preventive medicine. The triumphs of medicine in the last half century had been in the prevention of disease, for every man in that room had had three and a half years added to his life within the last twenty years by the studies of medical men and by the influence which the press had exercised over the Government and the people in promoting general healthy conditions of life. But in the advertisement columns he saw day after day advertisements which were full of gross and unmistakable falsehoods, and were on the face of them attempts to exploit the public credulity. With certain exceptions, when the *British Medical Journal* had brought this fact to the notice of the leading editors, their answer was "That is not our business; let the buyer take care of himself." Was that fair on the part of the newspapers? Half a century ago the quack used to go into the market-place in a handsome chariot with cream-coloured horses and a brass band. Nowadays, however, if a man wanted to sell a pennyworth of aloes for 10*s*. he hired some of the newspapers as his chariot. Some newspapers would not put in gambling or racing tips, nor would they insert any financial proposal which was on the face of it an impossible fraud. Why should the health of the people alone be the thing for which every scoundrel or pretender should have placed at his disposal the columns of nearly every newspaper in the country? He gave as an example a "skin tonic," which was sold at 11*s*. a bottle, and was, he averred, until recently composed of rather less than a halfpennyworth of corrosive sublimate. After referring to the various actions for libels begun but not persevered in by Mr. Harness, the lecturer said he wrote to the editors of all the newspapers on the subject of the "electric belt" advertisements, but the *Times* was the only paper that asked him for particulars, and subsequently refused to insert any more of the advertisements. The so-called religious papers were the worst offenders in the matter of quack and fraudulent advertisements. What he objected to was that quacks should have the power, under the Government stamp, which some people supposed gave a sort of guarantee of straightforwardness or value, to put forward statements palpably false. He thought that a great responsibility lay upon the Government which allowed this enormous traffic under conditions of *quasi*-sanction, or at least under conditions which facilitated fraud. The Government received £240,000 a year in three-halfpences from the sale of patent medicines. The word "patent" was in itself a falsehood. Before a man could get a patent he had to state what he wished to patent, and every one knew it, but the nature of the contents of these medicines was kept a secret, therefore they were not patent medicines. In conclusion, the newspapers should exercise the same supervision over the advertisement columns as they did over the editorial matter, and all medicines bearing the Government stamp should be required also to have a label stating their contents and composition.—*Times*.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JANUARY 27, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## DOCTORS' SHOPS IN GLASGOW.

ATTENTION has lately been directed to this subject in the *British Medical Journal*, and it is there stated that if medical men consider keeping open shops to be consistent with their position, they are individually within their rights in doing so. But it is also suggested as only reasonable in such cases that the provisions of the law relating to chemists' shops should be observed. Notoriously that is not the case in Glasgow, where the shops kept by medical men are left in the charge of unqualified assistants, who are sometimes mere boys, or even girls. Such a proceeding is entirely inconsistent with the requirement of the Pharmacy Act that sellers or dispensers of poison must have the qualification prescribed by the Act. The article in the *British Medical Journal* has drawn a reply from the secretary of a committee which has been formed in Glasgow for the purpose of defending the practice carried on by medical men in that city. It is maintained that if convictions such as those recently obtained are justifiable, a medical man might be convicted for supplying drugs to his own patients through the medium of an unregistered assistant, as that kind of supply is a sale all the same.

That view of the matter has relation rather to the mode of conducting medical practice than to the keeping of a chemist's shop, of which the Pharmacy Act alone takes cognisance, and though medical men do not require to be registered under that Act in order to keep open shop, it is only on account of their medical qualification that they are so exempted individually. The exemption does not enable them to delegate to persons without any qualification the sale or dispensing of poisons, for which a personal qualification of the seller is made necessary by the Pharmacy Act. It is in this respect that there is, in Glasgow, such an objectionable breach of the Act by medical men, and it is against that practice that the recent proceedings have been directed. The decisions already given have been very distinctly in favour of the view that in a chemist's shop kept by a doctor in virtue of his medical qualification, the provisions of the Act, in regard to the sale and dispensing of poisons, should be as fully applicable as in a shop kept by a chemist. Hitherto the cases have not gone beyond the inferior courts in Scotland, but the Glasgow Southern Medical Society, as a body of general practitioners, contemplates taking steps to obtain a definite and more authoritative decision from the higher courts. With that object a committee has been appointed to state a test case for appeal before the High Court of Justiciary, and a circular is being issued soliciting general practitioners to contribute funds for that purpose. It is certainly very desirable that the question should be definitely settled.

## "THE SELLER"—A NEW INTERPRETATION.

THE question whether liability under the Pharmacy Act is incurred by the person on whose behalf a poison is sold has been raised in Ireland by the prosecution of MRS. ANNA RUPPERT for the sale, by one of her agents, of a bottle of skin tonic containing corrosive sublimate. It was shown that the defendant had to some extent given directions prohibiting the sale of the preparation containing poison, and it was therefore contended by her counsel that as a principal is only liable for the acts of a servant done within the scope of the servant's employment, MRS. RUPPERT was not in this case liable for the act of her agent. A case that was decided on appeal in accordance with that general principle was relied on by the defendant's counsel, and the Dublin magistrate stated that, on the authority of that decision alone, he should have had no hesitation in dismissing the summons against MRS. RUPPERT. But another case under the Food and Drugs Act was referred to by him, in which a seller of milk was convicted for the sale of adulterated milk by a servant who had added water to the milk without his master's knowledge. On appeal it was held that the conviction was right, and that the master was liable for his servant's action in selling adulterated milk, the evidence rebutting connivance being admissible only with a view to mitigation of penalty. Mr. Justice HAWKINS was of opinion that for all practical purposes the master was the seller of the milk, and that he was properly made liable for the sale, just as he would be liable in a civil action for consequences of the acts of his servants, the master being the person responsible to customers, and the Act being intended expressly to prevent the sale of adulterated articles. Mr. Justice WILLES also held that in the case relied upon for the defendant, the servant had acted outside his orders in selling at all, and therefore it was totally different from the milk case, where it was the business of the servant to sell, and also the business of the principal to see that the servant did not exceed the scope of his employment. This view of the question was considered by the Dublin magistrate to be exactly applicable to Mrs. RUPPERT's case, and he felt coerced by it to convict her of having contravened the Statute.

This decision appears at first sight to be somewhat at variance with the one given in the WHEELDON case by Mr. Justice HAWKINS. But there is this important distinction between the sale of such articles as milk and the sale of poison, that while in the one case the act of selling does not require special qualification, and can be delegated to anyone to perform, in the other that cannot be done, and the sale of poison by an unqualified person is in itself an offence against the law, for which the individual selling is himself responsible. It would, however, appear from the decision of Mr. SWIFTE in the Dublin Court, and from the authorities on which he relied, that the master of an unqualified person selling poison may also be liable under the Pharmacy Act, unless it can be shown to the satisfaction of the Court that the unqualified person had been directed not to sell articles of poison, and this duty had been distinctly placed outside the scope of his employment. The necessity of exercising caution in this respect was shown in the recent case of the sale of white precipitate at Ipswich. The special effect of the enactment in the Pharmacy Act, constituting the sale of poison by an unqualified person in itself an offence for which that person is punishable, has frequently been somewhat obscured by undue consideration of the common sense view that the person on whose behalf a sale is made is necessarily the seller in such instances, as well as in ordinary transactions. In one sense he is the seller and, if unqualified, may be held liable in that capacity; while, on the other hand, if qualified, his qualification does not protect an unqualified servant from liability to penalty for infringement of the law, nor himself from liability for the consequences of the sale, in the same manner that he would be liable for neglect of a servant to comply with the requirements of the 17th section or for other negligence. In Mrs. RUPPERT's case, both she and her agent being equally unqualified, they were each liable to prosecution, and it was optional whether the one or the other should be proceeded against.

## DEATHS FROM CARBOLIC POISONING.

THE Return moved for by Mr. MACDONA, in the House of Commons—of the number of deaths in England and Wales during the years 1887 to 1891, inclusive, caused by carbolic acid—has just been printed, and shows that the total number of fatalities from this cause in the five years was 375. There were 138 deaths by accident, 236 suicides, and 1 classified under the heading "Murder and Manslaughter." The numbers for 1891 are 31 accidental deaths and 63 suicides, being in excess of those for 1890, but, taken together, about the same as those for 1888. On the whole, the female suicides were in excess of the males by nearly fifty per cent., but in the accidental cases this proportion is more than reversed. The main fact brought out by the Return is that, on an average during the five years, 27 deaths by misadventure were caused annually by carbolic acid, that is to say, so many valuable lives might have been spared by the adoption of proper precautions. So long, however, as carbolic acid remains an unscheduled poison it is probable that the preventible mortality attributable to it will increase rather than diminish. Voluntary deaths, of course, are not likely to be affected by any conceivable precautions. In a recent number of the *Bath Herald*, reference was made to the frequent deaths caused by carbolic acid, and the opinion was expressed that this fact should be sufficient to induce the Pharmaceutical Society to take steps for adding carbolic acid to the poison schedule. Mr. APPLEBY, the Society's local secretary at Bath, has very appropriately written to the editor of the paper, pointing out that such steps have long since been taken, and that the absence of carbolic acid from the schedule of poisons is simply due to the circumstance that the Privy Council has hitherto refused to approve of the recommendation made by the Council of the Society. It is desirable that the true position of the matter should be made known, since it is referred to in several newspapers as indicating some omission on the part of the Society to exercise its powers for promoting public safety.

## MEDICAL EDUCATION OF WOMEN.

WE are asked to announce that a lady much interested in medical missions has offered two scholarships, of the value of £100 and £50 respectively, to women who desire to educate themselves for medical work in the mission field. These scholarships are tenable at the Edinburgh School of Medicine for Women, and particulars can be obtained from the Secretary of that School, Surgeon Square, Edinburgh.

## METHYLATED SPIRIT—A CAUTION.

A letter which appears in this week's Journal (p. 620) draws attention to a hitherto unnoticed peculiarity of the methylated spirit made in accordance with the requirements of the Board of Inland Revenue, which may probably explain the accident which took place on a recent occasion, when the addition of methylated spirit to a snapdragon caused an explosion which led to several children being severely burnt. In any case, Mr. BOTTLE's observation that, under certain conditions an explosive mixture may be formed by the spirit vapour becoming mixed with air, shows that extra caution is requisite in handling methylated spirit as it is now made.

# Proceedings of Societies in London.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday last, January 18, Mr. H. H. Robins, Vice-President, in the chair, an interesting paper on "Sponges" was read by Mr. W. Murton Holmes, who dealt at length with the life-history, structure, classification, etc., of these multicellular animals, illustrating his remarks with a number of specimens and diagrams.

At the conclusion of the paper, the Vice-President expressed the indebtedness of the Association to Mr. Holmes for his kindness in reading such a valuable paper, and proposed that a hearty vote of thanks be accorded him for the trouble he had taken to bring so many specimens, and to illustrate the paper with so many diagrams. This was briefly seconded by Mr. R. H. Jones, and carried with acclamation, and, after Mr. Holmes had acknowledged it, the meeting terminated.

# Provincial Transactions.

### MIDLAND PHARMACEUTICAL ASSOCIATION.

The twenty-third annual ball of the Midland Pharmaceutical Association was held at the Assembly Rooms, Edgbaston, on January 18. There were about 120 people present, among whom were Mr. Charles Thompson (President), Messrs. W. Jones and R. D. Gibbs (Vice-Presidents), Mr. Lowther (Hon. Sec.), Councillor Barclay, Councillor Barrett (Leamington), and Mr. T. W. Chapman. Mr. Alfred Gregory's band was in attendance. There was a promenade concert at eight o'clock, and dancing commenced half an hour later, and was carried on until 2.30 a.m. Mr. E. J. Reynolds acted as M.C.

### MANCHESTER PHARMACEUTICAL ASSOCIATION.

The first ball in connection with this Association was held at the Hulme Town Hall on the 17th inst. The President of the Manchester Association, Mr. G. S. Woolley, held a reception from 8 to 9 p.m., by which time nearly 220 members and their friends had assembled at the hall. Dancing was then commenced, and kept up until 2 a.m., with an interval of an hour's vocal music. The Ball Committee had been fortunate in securing the services of Mrs. Worsley, Mrs. Webster, Mr. Vallance, Mr. Baines, and Mr. Dolphin, all of whom are well known in the Manchester district, and the short concert was much enjoyed. This first venture was a decided success, and the Ball Committee is to be congratulated on the result. Mr. T. B. Blyton officiated as M.C.

# Scottish Transactions.

### EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The fourth meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, January 17, at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair. The minutes of last meeting were read and approved.

A lecture was then given on the "Comparison of the Reproductive Organs of the Angiospermiæ, Gymnospermiæ, and Acrogenæ," by Mr. W. B. Cowie. By means of diagrams and a large model of the fruit of *Secale cereale*, the author gave a very interesting and lucid description of the origin and development of all the organs involved. The processes of pollination, fertilisation, and development of the embryo in the ovule were fully explained. The comparative homologies of the three divisions of plants were explained, and the differences pointed out. In the Angiospermiæ and Gymnospermiæ the egg-plant or oöphyte was concealed, inseparable from, and a mere appendage to, the spore-plant or sporophyte; while in the Acrogenæ differentiation takes place either in the spore-plant (heterosporous) or in the egg-plant (homosporous), and the egg-plant or oöphyte is large, and separates from the sporophyte or spore-plant, forming an independent individual. The relations of the three classes might be summarised thus:—

In Angiospermiæ, oöphyte small, dependent on sporophyte.

In Gymnospermiæ, oöphyte large, dependent on sporophyte.

In Acrogenæ, oöphyte large, independent of sporophyte.

There was thus a gradual reduction of the oöphyte in the higher divisions, the Gymnospermiæ being intermediate. Specimens of the male and female cones of *Pinus sylvestris*, *P. montana*, *Cupressus sempervirens*, and *Araucaria imbricata* were shown and fully explained.

Owing to the lateness of the hour, a paper on "Glucose in Syr. ferri iod.," by W. Lyon, was postponed till the next meeting.

### EDINBURGH PHARMACY ATHLETIC CLUB.

The second annual assembly was held in the Oddfellows' Hall, Forrest Road, on Friday evening, 12th inst., at 9 o'clock. There were about twenty couples present, and a very enjoyable evening was spent, Messrs. W. D. Jamieson and J. P. Gibb acting as masters of ceremonies.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The Association met on Thursday, the 18th inst., Mr. W. L. Currie presiding. The business of the meeting was chiefly in connection with the annual social meeting. The motion carried at a former meeting in favour of a conversazione and dance did not seem to be so favourably entertained as was necessary to warrant its success. After discussing the matter fully, the former motion was rescinded, and the President moved that, as there had been a movement on foot to present Mr. Kinninmont with a testimonial, if the members of the Association were agreeable, the committee in connection with the testimonial would take the opportunity of presenting it at their meeting. He had the greatest pleasure in bringing this before the Association, as there was no one more deserving of honour from them. It was due to him as Local Secretary, as an Examiner during twenty-one years, and as an honest man. It was the wish of Mr. Kinninmont that the testimonial should take the form of a fund to be administered in the interests of pharmacy students in Glasgow and the West of Scotland, and he (Mr. Currie) could state that nothing would give Mr. Kinninmont greater pleasure than receiving it at their hands. He therefore formally moved that a supper be held, at which the presentation should be made, and that any surplus coming from it should be used to augment the fund. Mr. W. Paris seconded the motion, which was carried without dissent. A committee was appointed forthwith to carry out the necessary details. The President afterwards brought forward a proposal to improve the condition of the library by adding new books to it. Mr. Isaac Hislop joined the Association.

# World's Congress of Chemists.

## CERTAIN DISTINCT ADVANCES IN THE ANALYTICAL CHEMISTRY OF RECENT YEARS.*

BY ALBERT B. PRESCOTT.

Of the important gains made by the present generation of chemists let us acknowledge (1) the resolute attempt to find out the composition of matter as a whole in any and all of its mixtures of whatever source.

Analytical workers have undertaken to resolve the complex mass and account for all its contents. It has been their ambition to identify and determine existing molecules of every sort within a given mixture, while synthetical workers have sought to reach the constitution of the molecules themselves. The task of complete analysis has been entered upon, that called "proximate" as well as that called "ultimate." There have been good investigations that have taken "extractive matter" and "empyreumatic matter" and "bituminous matter," and other undetermined residues as subjects for the beginning of chemical work rather than the end of it. The task of the complete analysis of matter in its every possible portion is a task that has been recognised and entered upon as a necessity of chemical advancement.

I do not by any means infer that the determination of distinct compounds is the result of analytical chemistry alone, as but one of the divisions of the science. On the contrary, I would emphasise the dependence of the analyst upon the entire body of chemical learning. He is limited by this dependence even for the identification and estimation of distinct bodies without going into the make-up of molecules. Analysis is, or ought to be, a certain function of the whole body of chemistry, not a part of the body which could live if separated. An analyst cannot well be less than a whole chemist, and though his ends be single in direction, they are not indifferent to the powers common to all chemical insight.

The analytic method began to yield large returns in the last century. When Black made more exact qualitative examination of fixed air he began to uncover that chain of underlying truth laid hold of by Priestley, and fairly dislodged by Lavoisier and other contemporaries. In the first half of this century the enormous analytical detail instituted by Berzelius extended the very foundations of physical science. And in the present generation the analyses of biological chemists and industrial chemists of many and various purposes have been very influential factors in the support of great principles of chemical truth.

Again, the courage of analytical effort in recent years has been seen especially

(2) In the elaboration of methods for the isolation of carbon compounds, both natural and artificial. "Proximate organic analysis" is not so greatly at a discount as it was twenty years ago. Research has been devoted to the examination of organic compounds, unbroken and unaltered. It has been a common necessity to effect determinations truly "proximate," in the definition of this inadequate word. There have been pointed inquiries from the biologist often, from the metallurgist at times, from the theoretical chemist not seldom, what is the chemical character of this body as it exists just before its analysis? Since Dragendorff devised ways of plant analysis, and Hoppe-Seyler collected methods of physiological analysis, thousands of contributions have enriched the resources of the organic analyst, and thousands of workers are now in like endeavour. Chemical literature is thickly strewn with directions for analysis to the end of the identification of the integral molecule, representing matter in its living state, if such a figure of speech may be used. This is indeed the special task of analytical research, although the terms of analysis are also given to operations that accompany synthetic work, to wit:

(3) In studies of the molecular structure of bodies produced by nature, bodies mineral, vegetable, and animal, as well as those of artificial production. To classify analytical work strictly by definition, which, however, I have no desire to do, all the studies of molecular constitution come within the range of analytical inquiry. But even under customary classification of chemical labour, it will be observed that certain instruments of observation early used by analytical chemists have since been found most effective in studies of molecular structure, even for what is termed the configuration of the molecule. Especially, therefore,

(4) In the employment of physical methods of inspection, whereby molecular change is avoided, important advances have been made in the analyses of recent years.

First of all through the several responses of the molecule to light, under more exact observation, the clearest of identifications have been obtained. Optical methods have multiplied and become more exact. We are, however, only in the beginning of their adaptation to analysis. Studies of geometric isomerism have shown the analyst how rich in results the polarimeter may become. Next to this, probably, stands the refractometer in its value as a means of recognition in analysis. Then the use of the spectroscope for studies of absorption by transparent bodies has already done admirable service to analysis, both organic and inorganic. New responses of matter to heat have been brought under observation. In qualitative determination, as in the finding of the molecular mass, the freezing point and the effect on solidifying points of solvents are in question, as well as the melting points and boiling points. The chemical world is alive with interest in the advances of the new physical chemistry. To these advances no one is, and is to be, more indebted than the analyst. Solubility itself, the great common factor of analytical operation, is under investigations in which the analyst has the keenest interest. The feebler influences of adhesion, too often overlooked, causing waste in quantitative separations and putting limits upon the best of our results for analytical recovery, these, with the phenomena of capillarity, are well under investigation. The very checks of control analyses serve as data for studies in molecular physics.

It is not possible for me to group together in classes near all the ways of advance in recent analytical chemistry, and I will but specify once more how this advance appears

(5) In the reciprocal benefits of scientific research and of technical skill. We see this in the work of experts, those in biological and pathological analysis, sanitary and forensic analysis, industrial and commercial analysis, agricultural and metallurgical analysis. Chemical literature during the last ten years shows how promptly discoveries like those of Emil Fischer in the sugar group, or those of Ladenburg upon hydrolysis of alkaloids, those of Gladstone on refraction equivalents, or those of Baeyer upon the phthaleins, become well reduced to practice in the operations of analytical work. The simple volumetric determinations of acid and alkali are expanded in tenfold application in thousands of analytical laboratories by means of varied indicators from the colour discoveries of coal tar chemists such as Otto Witt. Analysis bows its acknowledgment of indebtedness to

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* From the *Journal of the American Chemical Society.*

synthetic research. The interests of the section of analytical chemistry are all interwoven with the interests of all the sections of this Congress. The analytical chemist will be a good listener to all the papers in the rich and varied repertory of the week before us.

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## On Chemical Energy.*

BY DR. W. OSTWALD,

*Of the University of Leipzig.*

During the scientific development of chemistry, the hypotheses which have served as a primary foundation have always been borrowed from a prominent sister science. At the time of the most rapid development of mechanics, as founded by Galileo and advanced by his pupils and successors, chemistry was mechanical; the solvent action of acids upon metals was explained by assuming that the former possessed points and edges by means of which they disintegrated the latter; bodies which combine were supposed to have hooks, by means of which they attached themselves to each other. When Newton based his theory of astronomical movements upon the assumption of a force acting inversely as the square of the distance, chemistry shortly appropriated this idea, and traced all processes to the attraction and repulsion of particles. It is, therefore, not surprising that the phenomena of the Voltaic pile (which later proved to be so intimately connected with chemical changes) were at once utilised to serve as a foundation for a theory of chemical processes. These theories, especially that of Berzelius, have prevailed a long time, but finally have proved themselves just as insufficient to represent chemical phenomena as the mechanical and the attraction theories.

Thus the theory of chemical combinations is to-day a strange and contradictory conglomerate of the fossil constituents of the earlier theories. The rudiments of the theory of attractions still play the most important rôle, while there is also considerable discussion about positive and negative elements, *i.e.*, the residues of the electro-chemical theory, and in most recent times we see the long-forgotten mechanical conceptions again stepping to the front in stereo-chemistry and being accepted by many as a new step in the progress of science.

In such times it is of great value on the one hand to recall the historical development and the evanescence of theories; on the other hand to find in the older theories that which is useful and correct, so as to obtain sound building material for a new theory.

Especially are we forced to conclude from the fate of past theories that chemical phenomena must be explained by their own interrelations, that is, must be logically arranged. The use of analogies from other fields of natural science has indeed often led to suppositions which for the moment seemed satisfactory; on trial, however, such analogies have always proved themselves more a drawback than a help, since they hindered the unbiassed comprehension of facts, and they could not (or will not in the future) be cast aside without a great struggle and considerable sacrifice of time and labour.

It is scarcely needful, at present, to prove that the several provinces of quantitative science possess in a single conception both the principle which distinguishes them and that common principle which unites them, namely, the conception of energy. Mechanical energy is distinct from thermal; similarly, chemical energy is distinct from electrical; and in each province progress can only be made by studying the various properties which the form of energy under examination possesses.

At the same time, however, the laws which determine the correlation and conservation of energy constitute the only bond which unites the various fields. If heat could not be changed into mechanical energy, and chemical into electrical, these provinces would stand distinct and isolated from each other; and neither thermodynamics nor electro-chemistry would be possible. This shows that progress in the scientific conception of chemical phenomena depends upon primarily determining the several properties of chemical energy as such, and then its relation to other forms of energy; this done, we will be able to cope in a scientific manner with each chemical process, no matter whether it leads to other chemical changes or causes the appearance or destruction of other forms of energy.

The knowledge of the laws of chemical energy is not only scientifically, but also practically of the greatest interest. All energy which is employed in accomplishing the various purposes of industry is derived from chemical sources, the combustion of fuel. Besides each step that we take, every word that we speak, in fact, every thought formulated by our brain, leads to sources of chemical energy; animals and plants throughout their whole existence are based primarily upon chemical energy and its laws, and the ultimate problems of biology are in every respect chemical.

All forms of energy have this in common, that they may be resolved into two factors, both of which have definite properties. The one, which we call intensity, determines whether the energy may remain at rest or must undergo an exchange. Thus, for instance, the factor of intensity for heat is temperature, since we know that two bodies can be at rest with reference to their heat only when their temperatures are equal. The second factor we call capacity; it determines how much energy at a given intensity is present in the object under consideration. With heat, for instance, this is called heat capacity.

What now are the factors of chemical energy? If we had a measure for its factor of intensity, as the thermometer is a measure of the intensity of heat, we would be able to determine for each substance with reference to another whether it could react with the latter or not, just as the thermometer shows us whether or not heat can be transmitted from one body to another. Our answer is that this question has not been completely solved, but that for many phenomena we already possess a chemometer, as we might call the instrument—in analogy to the thermometer.

In order, however, to be able to explain the theory of the chemometer, the factors of chemical energy must first be more precisely determined. The factor of capacity is in this case most easily discovered. The chemical energy which is present under given circumstances is proportional to the weight or mass of the substances involved. Hence we sell and buy chemical energy according to weight. This becomes more clear from the following consideration: When we buy coal, we do not consider the carbon present, but rather the chemical energy, since in the use of the fuel we allow the carbon to escape quietly through the chimney as carbon dioxide, without making any effort to retain it; that, however, which we husband with the greatest care, is the chemical energy of the coal, obtained as heat. I have stated with due consideration that the factor of capacity of chemical energy is proportional to the mass; yet it is not mass, since this conception belongs solely to mechanics. It is therefore by no means more correct to say "atomic mass" instead of "atomic weight," since in this case the degree of chemical capacity is concerned which is proportional to both weight and mass, without being one or the other.

The term "degree of intensity" of chemical energy has something in common with the conception which has become familiar in the field of chemistry under the term of "chemical affinity," more to denote that field in which a more accurate knowledge was especially desirable than to combine by such a word sufficiently definite ideas. The word was there, just as the name of a future street stands on a signboard in the outskirts of a city, in a waste field; tents and barracks of the most curious kind have been erected from time to time, only to be deserted again; only in most recent times solid buildings and permanent settlements have found a place on this site, and soon a new section of the city will be created there, whose importance threatens to throw the older portions of the city in the shade.

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* From the *Journal of the American Chemical Society.*

J. Willard Gibbs called the degree of intensity of chemical energy the chemical potential; analogous to the degree of intensity of electrical energy, which is called the electrical potential. So, to avoid the vagueness of the term affinity, we will make use of the term chemical potential, or in brief potential.

Now it follows from the definition of the degree of intensity, that two substances with like potential cannot act on each other; and, conversely, that when two substances act on each other, their potential must be different.

That general law which can be regarded as expressive of the Second Theorem holds also for the chemical potential, namely, two potentials which individually are equal to a third are equal to each other. This proposition seems quite self-evident, and therefore equally meaningless. Yet we can draw from it conclusions that are very far-reaching. It says that two bodies or groups of bodies, which are in equilibrium with each other, can mutually replace each other at pleasure towards a third system in every reaction in which this third system (towards which equilibrium has been established) can react. Thus, for example, every soluble body can be replaced by its saturated solution, every liquid by its saturated vapour, every solid body at its fusing point by the melted body without causing any alteration in the equilibrium depending upon the former. Among other things, this shows that while the heat of solution, fusion, and evaporation change the evolution of heat during a chemical process, they do not thus affect the equilibrium. The thermal theory of affinity, which is even to-day championed by Berthelot and others, is by this circumstance proved to be quite untenable.

It is natural, in the case of such a far-reaching proposition, to require proofs. This proof is found in the fact that it is impossible to create a *perpetuum mobile*. To have a *perpetuum mobile* it is not necessary to create energy from nothing, but only to transform potential energy into kinetic. If it were, for instance, possible to transform the constant heat which is present in enormous amounts in the ocean into work which then could change back into heat, we would require no more coal to propel our steamships, since all the work which we require for their propulsion would be transformed into heat by friction and could return to the ocean in unchanged amounts. Such a *perpetuum mobile* will be instantly possible when two substances which individually are in equilibrium with a third are not in equilibrium with each other. If we assume that a substance, A, when in contact with a large body, B (the ocean), assumes a temperature which is different from that imparted to a body, B, simultaneously in contact and equilibrium with the ocean, we would cause a transmission of heat between A and B which would be capable of driving a machine. This proof is equally true for every other form of equilibrium and for every form of energy, and thus we also prove our chemical proposition.

When we have thus recognised the conditions under which energy is in equilibrium or at rest, we can directly reason that energy cannot be at rest when its potentials are different. A process must then take place by means of which they become equal. This is the most common phenomenon with which we are acquainted; everything which takes place is based in the last instance upon an equalisation of energies of different potentials.

Since, however, energy, as is a fact, has a never-ceasing tendency to equalise itself, the question arises why it has not done so long ago during the many thousand years which our system of worlds has existed. We continually see differences of potential existing in nature—compressed air, galvanic elements; all these contain stores of energy which are ever ready to act and must therefore be unequal. Likewise the fossil fuels and the sulphides of the metals are able in conjunction with the oxygen of the air to bring forth large amounts of energy during their interaction, and cannot, therefore, be in equilibrium. Aside from the tendency for equalisation, which is peculiar to energy, other forces are therefore active in nature which hinder or detain this, and an accurate understanding of these natural phenomena can only be attained when these opposing and detaining causes are known.

For mechanical and electrical energy such hindrances can be easily created. A spring may be kept wound by a weight; two electrically charged bodies, which tend to approach each other, can be kept from attaining their equilibrium by the dielectric resistance of an interposed medium. All these hindrances, however, have but this explanation, that the differences of energy present are compensated by the use of other energies, so that their equalisation is prevented; at the same time we can prove that, according to the method employed, large quantities of one form of energy of any magnitude can be compensated by equally small quantities of another form of energy; for by means of a small switch, enormous currents of electricity can be interrupted and closed at will.

In the case of chemical energy we are, however, very often unable to prove such compensations by the application of other energies. When a piece of wood is exposed to the air, it would be in accordance with the general tendency to equalise the energy present, if combustion took place and the wood combined with the oxygen of the air. The same would apply to organised bodies. Our body consists of combustible substances; and, in accordance with the chemical affinities present, it should combine with the oxygen of the air and burn without cessation. Why is it not consumed?

If we should attempt to answer this question we should soon become entangled in inexplicable contradictions. We cannot ask, "Why is our body not consumed?" since it does actually burn. It continually takes up oxygen and gives off carbon dioxide. The same answer applies to other chemical phenomena. A stick of sulphur exposed to the air seems unchanged, but it is only apparently so. In reality it is oxidised; slowly, however, and so slowly, in fact, that we would not notice it in weeks or months. If the process were, however, continued for years or decades of years, the oxidation could be measured. The rapidity of reaction is clearly proportioned to the surface. If we take finely powdered sulphur, flowers or milk of sulphur, whose total surface is much greater, we can prove the formation of sulphuric acid in hours and days.

What has here been stated for a few cases is a general truth. In every case where different substances which could act upon one another are in contact without having, practically speaking, any apparent action upon each other, we can bring the requirements of the teachings of energy into unison with the actual conditions by actually ascribing to these substances an action which is, however, so slow that it lies beyond the possibilities of measurement.

We have here the means of entering upon one of the most important and mysterious problems, namely' the search after the chemical activity of organised bodies. For, as all the activity of organisms depends upon changes in their chemical energy, all knowledge in this case depends upon a correct elucidation of the character of the chemical changes. If we can understand how the chemical processes of combustion, to which all physiological sources of energy finally lead, can be so regulated that they are able at any moment to adapt themselves to the ever-changing requirements of the organism, we have taken a step in every respect most important in the knowledge of life.

Let us take, for instance, a mixture of oxygen and hydrogen. Under ordinary circumstances we can preserve this mixture for a long time without the formation of a measurable amount of water. If, however, we place a piece of platinum sponge into it, the formation of water immediately begins; and it is as suddenly terminated when we remove the sponge. The platinum sponge has, moreover, undergone no change, and is able to exert this action for an unbounded space of time.

At first it seems as if we had here the first proposition of our later natural science; to rudely dispute "*causa arguat effectum*," since we have here a cause which can bring forth extended and large effects at pleasure without becoming exhausted. If we ask, however, what this proposition means by cause and effect, we find it to be degrees of energy. No energy of any kind can be created without the consumption of an equal amount of energy, and no difference in the potential of energies can be called forth without the simultaneous disappearance of equivalent differences in the potential of other energies. The truth of these propositions is not cast in doubt by the experiment with the mixture of oxygen and hydrogen, since the heat of combustion remains the same both when combination is effected by an electric spark and when it is brought about at the ordinary temperature by means of platinum sponge. While, therefore, the law of cause, clothed in the form of a principle of energy, regulates the final result of the action in an unchangeable manner, the time during which this action takes place remains absolutely independent of this principle, and we have side by side with the absolute necessity of this law of cause the freedom with reference to the time during which it exerts its influence. Therefore we see that all possible phenomena which, originating from the same substances, reach the same products, arrive at these with a very different rapidity. The object to be arrived at is unchangeable; whether it is, however, to be accomplished in a second or in several thousand years is a circumstance over which we have full control.

The name "catalytic bodies" has been given to substances which cause chemical reactions without experiencing any change themselves. We will now change this definition so as to read thus: Catalytic substances are those which modify the rapidity of a definite chemical reaction without changing their own content of energy. To place a catalytic substance into the reacting bodies, and to remove it, requires theoretically no work. This proves that within the strict province of the law of energy, there still remains room for the greatest variation in the temporal extent of the phenomena.

This peculiar circumstance has its foundation in the fact that in the expression of most degrees of energy time is not mentioned, and that, therefore, the equation of energy does not determine the extent of time involved in the phenomena.

One exception is made in the case of kinetic energy, which depends upon the rapidity. What has been stated above does not therefore apply to this form of energy. Upon what the action of catalytic substances depends is still a mystery, the solution of which is the more difficult, since it can only be explained by means of new principles, which are beyond the law of energy. At present, we must be satisfied with the knowledge that it is a fact, and must seek to become acquainted with the laws involved. A beginning has already been made; from a large number of various investigations it has been found that many chemical reactions, which usually take place very slowly, are hastened by the presence of free acids; or, to speak in the language of the modern theories, by the presence of free hydrogen-ions, and that this action is proportional to the concentration of the latter. The greatest variety of phenomena have been examined in this respect, partly by me, partly by my pupils, and I have as yet found no case where this statement did not apply. Free hydrogen-ions are therefore without doubt exceedingly active catalysators of a general character.

At the same time numberless specific catalysators exist, which act only upon certain phenomena. These are the ferments, organised and unorganised. These also are unable to do more than to change the rapidity of certain reactions in one or the other respect, and all attempts to explain their action must be based upon this, their sole property. The laws which they obey appear to be of an extremely complicated nature, especially with the more complex constituted ferments; this is probably due to the fact that they undergo a change themselves while influencing a certain chemical reaction.

I need not show in an extended manner that the wonderful action of living organisms can be traced to a regular impulse upon the chemical processes which take place among their constituents in accordance with general chemical laws, and that these again may be traced to the action of catalytic substances. If the rapidity of reaction in a muscle is hastened, which may be regulated from a central organ, this muscle will accomplish a corresponding amount of work. When, however, the supply of energy is exhausted, the influence of a catalysator cannot force it to any further manifestations. The same is true for all other activities of organisms.

I cannot assume to have made clear the mystery of life in the previous pages, but I believe that I have solved a more apparent problem, namely. to show that the science which is seemingly abstract and foreign to actual life, and which has developed during the last years under the name of physical chemistry, is a science of the highest real importance. If it will be possible for this science to throw light upon that most difficult of all the problems of nature, the mystery of life, how much easier will it be to explain by means of the new principles the by far much easier problems of technical chemistry which have not been solved so far. It is quite natural and self-implied, but we must nevertheless repeat again and again that—"The more perfect the theoretical evolution of the sciences becomes, the greater will be the scope of their explanations, and at the same time the greater their practical importance."

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# Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACTS AT PAISLEY.

Before Sheriff Cowan, at Paisley, on Thursday, January 18, Charles Maitland Christie, 18, Gilmour Street, Paisley, was charged, at the instance of Richard Bremridge, 17, Bloomsbury Square, London, W.C., Registrar under the Pharmacy Acts, 1852 and 1868, with the concurrence of George Hart, Procurator-Fiscal of Renfrewshire, with having sold a quantity of morphine and a quantity of chloroform on September 11 last, he not being a duly registered pharmaceutical chemist or a chemist and druggist under the Pharmacy Acts. The complaint set forth that the offence was committed within the premises of the Medical Hall Company, Limited, 18, Gilmour Street, Paisley, where he was employed as assistant, the poisons being sold to Joseph Tait, residing at 21, Oxford Street, Edinburgh, and forming part of the ingredients of a quantity of chlorodyne, the penalty to which the respondent had rendered himself liable being £5.

Mr. William Walker, writer, Paisley, instructed by P. Morison, S.S.C., Edinburgh, conducted the case for the complainer, Mr. John Pattison, solicitor, Paisley, appearing for the respondent.

The respondent pleaded guilty.

Mr. Pattison said: On behalf of the respondent your lordship will find that what the accused has pleaded guilty to is selling a small quantity of chlorodyne, and it so happens that the chlorodyne contains the two poisons which are referred to in the indictment. My client was well aware that chlorodyne did contain these ingredients, and he was very particular in the whole course of the conduct of this business.

The Sheriff: Do I understand you to say that the respondent was quite well aware at the time he sold it that the chlorodyne did contain these poisons?

Mr. Pattison: Yes, my lord. And I have to say that so far as he was concerned he has been very particular in the manner in which he has conducted this business. I might digress for one moment to explain the circumstances in which this offence occurred. Prior to August 28 last the accused was engaged in chemical work, at that particular time being engaged in a chemical place in Greenock. When the advertisement appeared in the newspapers as to the appointment in the Medical Hall in Paisley, he applied for it and was successful in obtaining it. The Medical Hall people understood that Mr. Christie was registered; while he, on the other hand, understood that it was not necessary that he should be registered as a chemist. Immediately after he entered on his duties, he found out that he ought to be registered, and he then took this very important step, that on September 6 he went to Edinburgh to see the assistant secretary there of the Pharmaceutical Society, his intention being to explain the position in which he was placed. Unfortunately, the representative of the Society was, at that date, not at home. The respondent returned on September 15 to Edinburgh and, having on that occasion seen the assistant secretary, he explained to that gentleman his position. Unfortunately, in the meantime, it appears that on September 11 he had sold this small bottle of chlorodyne, which article has a very general sale in the business of a chemist. It is of exceedingly great importance to note that at that time it was practically arranged that the accused should go up in January for his final examination, and he understood that in the meantime nothing would go wrong with the business; in other words, that the Society would not, in view of this, step in and interfere with him in his conduct of the business. There is no doubt of this, that the accused is thoroughly well up in the practical department of chemistry. From that time the respondent applied himself diligently to his studies with the view of going up for his final examination. In the middle of November he found that he had so much ground to get over that he would not be able to pass the examination, at all events, he feared that he might not succeed, the result being that he intimated to the Medical Hall Company that he must resign his appointment, which he did. It is in these circumstances that I ask your lordship to consider very leniently this matter. There is no doubt whatever that he has been guilty of an offence against the strict terms of this very strict Act, but I think that the circumstances that I have explained to your lordship will enable your lordship to approach the question of the amount of the penalty incurred with a very considerable modification.

The Sheriff: Was it just on one occasion that Mr. Christie sold this chlorodyne?

Mr. Pattison: Yes, my lord, just on the one occasion. Under the Pharmacy Act, I was about to explain that what the Act has more particularly in view is the carrying on of a business by a chemist holding himself out to the public to be a duly qualified chemist, but here in this particular case with which we are dealing there is nothing of that kind. The business in this case belongs not to my client, but to the Medical Hall people, a limited company who employ him. He is only an ordinary employé with this limited company. In the whole circumstances of the case I think that the accused has been guilty only of what might be called a mere technical breach of terms of the Acts. In substance, I think that my client has been very careful in the conduct of the business, so that no danger to the public could arise, he having taken such steps as any reasonable man would take to prevent anything in the way of an accident occurring, and he has also done all that he could to protect all concerned in connection with the business.

Mr. Walker said: This case, my lord, is brought under the Pharmacy Act of 1868, and its object is to correct an evil which, it is suspected, prevails too largely. The purpose of the Act is as set forth in the preamble, "the safety of the public;" to protect the public, in short, against incompetent and unskilled persons either "selling poisons," or, as it says in the 15th section, "keeping open shop for the retailing, dispensing, or compounding poisons, or using, etc., the name of chemist or druggist, not being registered, or compounding medicines of the British Pharmacopœia, except according to the Pharmacopœia," and so on. The case here is under the first head, that of selling poisons; and the test of skill that the Act applies to a person for that is, that he shall be a person who is registered as a chemist. That implies that he has passed the examinations required by the Pharmaceutical Society, and be duly registered under the Act. These, I think, are very salutary provisions, and ought to be observed. The case here happened upon September 11 last, and the witness Tait, an assistant in the Edinburgh office of this Society, went into this shop, the proprietors of which are the Medical Hall Company (Limited), and he asked for a small bottle of Collis Browne's chlorodyne.

Mr. Pattison: You might please produce the bottle of chlorodyne which was purchased, so that the court may see it. [The bottle was accordingly produced.]

Mr. Walker: That is not a patent medicine, merely a proprietary one, and he got ordinary chlorodyne. It is not patented. There is a dispensation in section 16 of the Act that any person can sell patent medicines. This was clearly not a patent medicine. It differs in that from some cases which were recently brought up in Glasgow, where it appeared that some chemists were in the habit of erroneously regarding certain proprietary or stamped medicines as patented. The bottle contained morphine and chloroform in somewhat the usual proportions in chlorodyne. These two poisons are scheduled poisons under the Act, and are sufficient for our purpose here.

The Sheriff: You found upon his having sold poisons without being registered, and you are at one with Mr. Pattison that it was only the one occasion?

Mr. Walker: Yes, my lord, that is so; it is only one act on which I libel. There is just this other fact that I think it right that I should call attention to. A statement was made by Mr. Pattison that the accused had gone up to Edinburgh and called upon Mr. Hill to explain his position, and also to justify himself, I suppose.

The Sheriff: Was this after the sale?

Mr. Walker: Yes, my lord; regarding that matter I wish to read Mr. Hill's statement. Mr. Hill has it noted in his precognition as follows:—"About the time I was making inquiries about the shop, or shortly after the sale, the accused called upon me at my office in Edinburgh, to see if he could be allowed to continue as manager, although unqualified. I pointed out to him distinctly that he was breaking the law, and that every moment he remained in that position he was liable to the penalties provided by the Act. I understood him to express a wish that I would not proceed against him; but I distinctly warned him, in the clearest terms, that if so instructed by the Registrar it would be my imperative duty to proceed against him." Now, my lord, that call was *ex post facto*, and was only made in view of the fact that he was caught selling poisons here. In the whole circumstances I do not see much to justify the fact that a large shop like this one should be left without any properly qualified person, according to the Act, being in charge of it. There is only the one qualification that the law recognises, and it is not for individuals to override the requirements of the Act, and against it set up their own opinions as to whether they are qualified or not; nor their employers for them. In these circumstances I hope in this case your lordship will impose an exemplary penalty; one that will not only be punitive in this case, but which may have a deterrent influence on others who may not be paying due respect to the statutes.

The Sheriff: I understood the respondent's agent to make the statement that he had resigned his appointment, which, in my opinion, meant that he had ceased to keep the shop; but if he is going on keeping the shop that is a totally different matter altogether. While I may modify the fine to some extent, I certainly cannot do so to the extent I would have done otherwise. If it had been a single act, and the appointment immediately thereafter resigned, and the respondent had ceased to keep open the shop, then I would have been disposed to have given effect to a very considerable modification of the fine. I cannot now do that. The sentence of the court is that you pay a fine of £2 10*s*., and £1 4*s*. 6*d*. of expenses, recoverable by poinding and sale under certification, or to one month's imprisonment, failing payment.

The fine was paid.

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### Proceedings under the Pharmacy Acts at Greenock.

In the Greenock Sheriff Court, on Monday, the 22nd inst., Sheriff Henderson Begg on the bench, a complaint was heard at the instance of Mr. Richard Bremridge, No. 17, Bloomsbury Square, London, W.C., registrar under the Pharmacy Acts, 1852 and 1868, with the concurrence of Mr. Robert J. Blair, Procurator-Fiscal Depute of Renfrewshire, at Greenock, against James Docker, No. 28, Hamilton Street, Greenock. The libel stated that Docker had been guilty of an offence within the meaning of the 1st and 15th section of the Pharmacy Act, 1868, in so far as on or about September 11, 1893, the respondent, not being a duly registered pharmaceutical chemist, or a chemist and druggist, within the meaning of the Act, and within the premises, No. 28, Hamilton Street, occupied by the Greenock Apothecaries' Company, unlawfully did sell to Joseph Tait, residing at 21, Oxford Street, Edinburgh, a quantity of morphine and a quantity of chloroform, both being poisons within the meaning of the Act, the said two poisons when sold forming part of the ingredients of a quantity of Dr. J. Collis Browne's chlorodyne, whereby he became liable in a penalty of £5.

Mr. R. B. Shearer, writer, instructed by P. Morison, S.S.C., Edinburgh, appeared for the complainer. Mr. W. McClure, writer, was agent for the respondent, who pleaded guilty.

Mr. McClure said Mr. Docker had pleaded guilty to what was undoubtedly a technical breach of an Act of Parliament, but while that was so his lordship would notice that it was for being an unregistered chemist. It was not for being an unqualified chemist; Mr. Docker had had seventeen years' experience. The offence was one of having sold some chlorodyne, which contained morphine and chloroform. Apart altogether from the size of the bottle which was sold, and the amount of morphine contained therein, he wished to point out that this was one of the medicines which, at any rate in a general way, had been named by the public as a patent medicine. This was the first case of the kind in town, so far as he was aware, and he supposed that it had been brought into court as a warning to chemists generally; and, therefore, while Mr. Docker had pleaded guilty, he (Mr. McClure) submitted to his lordship that any penalty to be imposed should be the smallest. In one of the cases recently heard in Glasgow—a case which was on all fours with the present one—the Sheriff fixed the smallest penalty, namely, 5*s*. with costs, and he submitted that in this case his lordship should do the same. From Mr. Docker's experience those dealing in the place of which he was in charge were as well protected as they would be in any shop in town; still, a technical breach having taken place, Mr. Docker pleaded guilty.

Mr. Shearer said the penalty was provided by the Act, and poinding was simply in execution. Continuing, he said that with reference to his friend's remarks as to this case being on all fours with the one in Glasgow, it was proper to draw his lordship's attention in the first place to the striking difference between the present case and the one in Glasgow, owing to this fact, that the bottles of chlorodyne in the Glasgow case were not labelled "poison." They had been supplied previous to a recent case, in which it was decided to be necessary that chlorodyne should be marked "poison," and the excuse brought forward in the Glasgow case was that the bottles were supplied in ignorance of the fact that chlorodyne came under the restrictions of the Act. In this case the bottle was distinctly labelled as containing morphine and chloroform, which the law now required to be labelled "poison." The Society had no desire to press too hard upon any individual, but his lordship would observe that in the preamble of Act, 1852, and also in the preamble of Act, 1868, the words with which each Act began were, "Whereas it is expedient for the safety of the public." That was the first consideration which he submitted should be kept before the court, and if it was the case that some companies and druggists found it sufficiently profitable to employ unregistered assistants and pay fines when they were brought into court, it seemed desirable in the interests of the public that such a fine should be imposed, even in this case, as would really act as a deterrent. Practically the punishment would fall on the employer; but there was a decision which showed that the individual who should be prosecuted was the actual person who handed over the poison. He asked his lordship to impose such a fine as would be in the interests of the public and act as a deterrent, and not such a fine as was likely to simply encourage people who were disposed to employ unregistered assistants.

Mr. McClure said it was the intention of his client to get registered. He was qualified by experience, but would at once prepare for his examinations.

Mr. Shearer: My information is that the respondent has not even passed the Preliminary examination.

The Sheriff said he was not inclined to impose a severe penalty. This was the first prosecution in Greenock under the Act, which seemed to have been in abeyance for some time, and he would, therefore, fine the respondent £1, with £1 1*s.* 6*d.* expenses.

### PROCEEDINGS UNDER THE PHARMACY ACTS AT STOCKTON-ON-TEES.

At Stockton-on-Tees County Court on Tuesday, before his Honour Judge Turner, the Pharmaceutical Society of Great Britain sued Mr. George Ridley Toogood, managing director of the firm of Messrs. Toogood and Co., Limited, Stockton, grocers, for £5 penalty for a breach of the Act regulating the sale of poisons. Mr. T. R. Grey, barrister, instructed by Messrs. Flux, Son and Co., London, represented the Pharmaceutical Society; and Mr. Bonsey, instructed by Messrs. Neve and Beck, on behalf of the Patent Medicine Vendors' Association, appeared for the defence.

Mr. Grey, in opening the case, said that the Pharmaceutical Society was suing defendant for the sale of poison contrary to the Pharmacy Act of 1868. The defendant in the case was Mr. George Ridley Toogood, who, he believed, was managing director of the firm of Messrs. Toogood and Co., Limited. The firm occupied premises called the Central Buildings, Nos. 3 and 4, in Stockton. The title above the shop, he understood, was the "Elephant Cash Grocers," and it was also stated that they were "Patent Medicine Vendors." It appeared that on November 17 of last year defendant sold to Mr. Thomas Golightly a bottle (produced) of Freeman's chlorodyne. It was supposed to be a remedy for several different complaints, such as consumption, bronchitis, winter cough, and eight or ten others named on the bottle. It was a proprietary medicine, not a patent one. The preparation was analysed, and the bottle, which was only a half-ounce one, was found to contain as much as 1·05 grain of morphine. That was to say, over a grain of morphine in that small bottle, and morphine, as he would show, was a poison under the Act. The Pharmacy Act was 31 and 32 Victoria, cap. 121. The preamble stated that it was an Act to regulate the sale of poisons, and for the safety of the public. It was specified that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should pass an examination. Section 1 of the Act made it unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, unless such person was a pharmaceutical chemist within the meaning of the Act, and that he must be registered under the Act, and conform to such regulations as to the keeping, dispensing, and selling of poisons as might from time to time be prescribed by the Pharmaceutical Society, with the consent of the Privy Council. Section 2 defined what a poison was, and said that the several articles named and described in Schedule A should be deemed to be poisons within the meaning of the Act, and that the Council of the Pharmaceutical Society might from time to time, by resolution, declare that any article in such resolution named should be deemed a poison within the meaning of the Act, and thereupon the Society should submit the same for the approval of the Privy Council, and if such approval be given, then such resolution and approval should be advertised in the *London Gazette.* "Preparations of morphine" constituted an addition to Schedule A by a resolution of December 20, 1869, being specially named therein.

His Honour asked if a second Act was passed.

Mr. Grey said yes, but only amending another section. He need not call his Honour's attention to it. Section 13 of the Act made the Register, placed before his Honour, evidence. That was to say, if the defendant's name did not appear in the list, he had then to be considered as not registered under the Act, and as liable to a penalty unless he could show reason to the contrary. Section 15 said that any person who should keep open a shop for retailing, dispensing, or compounding poisons should be liable to a penalty of £5, and the same might be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act. There were two cases which affected the one now before that court. One was tried last year in the Queen's Bench Division—the Pharmaceutical Society *v.* Piper. It was a chlorodyne case, as this was. The defendants were a firm of grocers who sold proprietary medicines, and evidence was given showing that the bottle contained a grain of morphine. He also referred to the case of the Pharmaceutical Society *v.* Wheeldon, where it was held that an unregistered chemist's assistant, in the absence of his master, selling any poison, was liable, notwithstanding that his master might be registered. He quoted Mr. Justice Hawkins' decision, and stated that in the present case he should be able to prove that there was as much as one grain of morphine in the bottle, and not only was that a dangerous amount, but one grain had been known in many cases to be fatal to a man, and that children were peculiarly susceptible to the poisonous substance called morphine.

Thomas Golightly was the first witness called, and said he lived at Norton. On November 17 last he bought the bottle of Freeman's chlorodyne (produced) from Mr. Toogood himself. He paid 10½d. for it, he thought, and gave the bottle to Mr. Moon.

Mr. Harry Moon, clerk in the office of the Pharmaceutical Society, said that he received the bottle from the last witness and handed it over to Mr. Eastes, analyst.

Mr. Ernest Jno. Eastes, F.I.C., analyst and assistant to Professor Attfield, said that he received the bottle from Mr. Moon, and carefully analysed its contents. He found more than one grain of morphine in it. There was 1·05 grain. The size of the bottle was half an ounce. Morphine was a poison within the Act.

Was there a dangerous quantity of morphine in that bottle?—Yes.

What is supposed to be a fatal dose?—I believe one grain is fatal to an adult.

And with regard to an infant?—Very much less.

By Mr. Bonsey, cross-examined: It was a half-ounce bottle, and there were other things in the compound besides morphine; very likely seven or eight other things. Morphine was extracted from opium; it was the chief active constituent of opium. In the schedule of the Act there were certain poisons, and to some of them it was added "and their preparations," and to some those words were not added.

How would you define a preparation of a drug?—Well, I should consider that a preparation of a substance was a compound into which that substance entered.

Do you mean that a compound into which one of those things enters is a preparation of the thing?—I should say so.

Then do you mean to say that a plum pudding is a preparation of plums?—I do; that is a very good illustration.

Is not a preparation the same thing in a different form as distinguished from a compound containing half-a-dozen different things?—Hardly.

Is there any difference between a preparation and a compound?—They are very nearly synonymous.

Do you see any distinction between a preparation and a compound?—Not in a general way.

Do you in any way at all?—No, I cannot think of any particular case in which I should.

By his Honour: So that a preparation and a compound come to the same thing?—Practically.

Dr. A. P. Luff, Physician, etc., Lecturer on Medical Jurisprudence and Toxicology to St. Mary's Hospital, Examiner in London University, and Official Analyst to the Home Office, said he agreed with the last witness as to the dangerous quality of the poison. Infants and young persons were extremely susceptible to very small doses of morphine. The smallest dose of morphine that was recorded to have killed an infant was one-twelfth of a grain; but proportionately much smaller doses of opium had killed.

By his Honour: Witness meant compounds that contained smaller doses than one-twelfth had killed infants.

By Mr. Grey: A person not in good health, or suffering from Bright's disease, was liable to be killed by very small doses. It was stated that one-hundredth part of a grain might kill an infant, and he believed it to be possible if the infant were not in a good state of health. The contents of the bottle in question contained more than sufficient quantity to prove fatal to an adult.

Cross-examined: Witness's definition of a poison would not be dependent upon the quantity taken. In the present case it certainly depended upon the quantity taken as to whether it was a fatal poison. He did not entirely agree with Mr. Eastes that a preparation was the same as a compound. Six or eight different drugs together would naturally be a compound, though it might also be a preparation, because it might include a preparation of those drugs. He should define a preparation of a substance as the result of a chemical or physical alteration in the constitution of the substance. He called chlorodyne a compound containing a preparation of morphine.

Mr. Bonsey, in defence, said he was not going to call any evidence, although he had had an analysis made; but it practically agreed with that of Mr. Eastes as to the quantity of morphine. The Act was not a penal one, and although the Society was acting perfectly legitimately, yet it was for the protection of one trade against another. That was to say, the chemists wanted to have a monopoly of the sale of proprietary medicines, and objected to them being sold by persons who were not chemists. But if they wished to secure protection under the Statute they must form their action in conformity with the Act. They were charged with selling a poison, to wit, a preparation of morphine called chlorodyne. He said that chlorodyne was not a preparation of morphine at all. According to the evidence it was a compound which contained some eight or ten different drugs, and it would be perfectly ridiculous to say that a compound of that kind was a compound of any one drug. It must be a compound of the different drugs of which it was made up. To show that there was that distinction between the preparation of a drug and a compound it was only necessary to look to the Schedule of the Act. The chlorodyne was no more a preparation of morphine than it was of any of the other drugs of which it was composed, and therefore he held they were entitled to a verdict. He argued that no rule had been laid down in the case of Piper, and said the difference was that whereas the Society said it was only necessary to say that in any compound there was poison, no matter what the quantity was, to bring it within the meaning of the Act, he said the Act only applied when the poison was sold in its simple state. The higher courts had said that neither of them was right in their contentions. In Piper's case it was brought within the Act, but in Delve's case it was said that there must be a substantial quantity. He pointed that out to show the difference in the cases, and that the court had not laid down any rule. He only wished they would. As to the proprietary medicines, the chemists and the grocers, he argued, were alike, because neither of them knew the secret ingredients of the proprietary medicines. To put a stop to that the legislature ought to say they would not allow any secret nostrums to be sold.

His Honour said he was bound to follow the decision in the case against Piper, as this was an exactly similar case, and he accordingly gave a verdict for the plaintiffs for £5 and costs on the higher scale.

Mr. Bonsey: Will you give me leave to appeal in this case?—No, I refuse to give leave to appeal.

### Poisoning by Strychnine.

At the Star and Garter, Battersea, on Saturday last, Mr. A. Braxton Hicks held an inquest as to the death of Mary Ann Hutchinson, 31, the wife of a grocer, Dashwood Street, Battersea, who had poisoned herself with Battle's vermin killer on the previous Tuesday.

Joseph S. F. Hutchinson, the husband, stated that he had one packet of Battle's vermin killer in the house, and he learned that his wife had taken that poison. He sent for medical assistance; three doctors attended and administered an emetic, but death took place at 10.10 on the same night. He imagined that she took the poison in a moment of pique to frighten him. Witness purchased the poison at Messrs. Walter and Sons, wholesale grocers, of Wandsworth Road, in November last, to kill rats.

Dr. M'Cloughlin stated that death was due to strychnine poisoning. The vermin killer contained from 23 per cent. to 26 per cent. of strychnine, and would be very rapid in its action.

Mr. William J. Green, a chemist, of Wandsworth Road, said that he sold Messrs. Walter and Co. the packet of poison referred to.

Mr. William Walter, of the firm of Walter and Son, was called, and admitted purchasing the poison and selling it to Mr. Hutchinson.

The coroner: I am afraid you have got yourself within the four corners of the Pharmacy Act.

The witness: I am half afraid that I have.

The coroner: This was clearly an improper sale of poison, and I shall report it to the Pharmaceutical Society.

The jury returned an open verdict—that it was doubtful with what intent the poison was taken.—*Standard.*

### Poisoning by Carbolic Acid.

At an inquest held at Ramsey, Isle of Man, on Saturday last, on Alice Quayle, a domestic servant, aged 20, who died on the previous day from carbolic acid poisoning, a verdict of "Death by carbolic acid administered by deceased while in a state of temporary insanity" was returned. Dr. Tellet, one of the medical gentlemen called in, said that carbolic acid was a dangerous poison, and the Government ought to put restrictions upon its sale. At present people were able to get it too easily.—*Manchester Courier.*

### Action Concerning the Refining of Cottonseed Oil.

At the Guildhall, on January 23, before Mr. Baron Pollock and a special jury, the case of Morfit *v.* Price and Co. was heard.

In this case Dr. Campbell Morfit claimed from the defendants, Charles Price and Co., the well-known oil refiners and candle makers, damages for breach of an agreement dated February 8, 1893, under which the plaintiff granted to the defendants the exclusive right to use his process for refining cottonseed oil in consideration of their paying him a certain royalty. The defendants bound themselves to give the process a month's trial, with the following proviso:—"That no fresh plant than at present in use in Messrs. Price and Co.'s works be required, or only to such an extent as they might think advisable." Further, the agreement contained a clause that it was entered into upon the express condition that the cost of refining by the plaintiff's process should not exceed 2s. per ton of oil, over and above the cost of producing the defendants' oil known as the Maltese Cross brand. The plaintiff handed to the defendants upon the completion of the agreement a manuscript book, detailing the process and the ingredients used; but they had refused to work the same, and had thus broken their part of the agreement. The defendants pleaded that the process was not an entirely novel one; further, that it was not patentable, and a bleaching agent was used, all of which was contrary to the representations made by the plaintiff, which induced them to enter into the contract. They also alleged that the cost of production would exceed the stipulated sum of 2s. per ton, over and above the cost of the Maltese Cross brand, and that it would require a material addition to the plant they already had in use at their works; and, lastly, that by reason of the premises the plaintiff could not grant the exclusive use, and that on these grounds, on or about February 8, 1893, they had rescinded the said agreement and offered to return to the plaintiff his manuscript book.

Mr. Terrell and Mr. H. C. Gollan appeared for the plaintiff; Mr. Fletcher Moulton, Q.C., and Mr. W. E. Hume Williams for the defendants.

Mr. Terrell, in the course of his opening, said the plaintiff, Dr. Campbell Morfit, was a distinguished chemist. He had spent two and a half years in the study of the purification of oils and their allied substances, with the result that he claimed to have found a method whereby cottonseed oil could be refined equal to olive oil. Cotton oil was pressed from the seeds of the cotton plant. According to the age of the seed, the quality of and the impurities in the oil were greater or lesser. Purging was applied to it, and for this purpose dilute caustic soda was used, as the result of which a precipitate of impurities formed. It was at this stage that the plaintiff's process came into operation. He treated the oil, after it had been separated from the foots (sediment) which had formed, with a small amount of very strong caustic soda, and after the action caused by this had taken place he added a portion of common whiting. These two in combination undoubtedly produced a definite reaction, and a precipitate of remaining impurities sank to the bottom. Bleaching, as it was now practised to accomplish the same purpose, affected the oil chemically, while the plaintiff's process was harmless and produced a light-coloured edible oil, with a sweet taste, freed from any objectionable smell or flavour observed in oils obtained by processes hitherto tried. Mr. Terrell then proceeded to give a history of the negotiations between the plaintiff and the defendants, reading letters and other documents that had passed, and claimed on behalf of his client that he had kept his part of the agreement. On the other hand, the defendants, who had every opportunity given them of judging of the value of the discovery before binding themselves, as they had done, to give it a month's trial and if found satisfactory and successful from a commercial point of view to adopt it and pay the royalty stipulated for, had broken their part and rendered themselves liable in damages to the plaintiff.

Evidence was then given by the plaintiff, who was cross-examined at considerable length by Mr. Moulton as to the cost of the process and the plant required.

Mr. Allen, analytical chemist, and Dr. Otto Hehner, past president of the Society of Public Analysts, stated that in their opinion the ingredients in the plaintiff's process were used by him in a manner not before attempted, and produced an oil superior to that hitherto obtained from cotton seed, and that a practical man could adapt the process at a less cost than the estimate of the plaintiff. Mr. Meggett, oil refiner, of Hull, also supported the plaintiff's view as to the value of the discovery and the cost of working it. After Mr. Corkling, a friend of the plaintiff, to whom he had entrusted the negotiations with the defendants, had given evidence of what he had done in the matter, the plaintiff's case was closed.

Mr. Moulton, for the defendants, said that inventors often formed exaggerated estimates of their inventions and of the use they were when put into actual practice. There were two points the defendants made special provision for in the agreement they made with the plaintiff. One was the cost and the other the plant required to give the process a trial. These were conditions precedent to the plaintiff receiving any benefit, and after hearing the evidence that would be called before them he (Mr. Moulton) should ask them to show by their verdict that the conditions had not been kept, and that the plaintiff had not established any case entitling him to the damages he claimed.

Mr. John Dodds, the defendants' confidential manager, was then called, and, in answer to Mr. Moulton, said that it was impossible with the plant at present in use at the defendants' works to put the process as described in the manuscript book into operation. The cleanliness prescribed would be impossible with the tanks they had, which, to begin with, were not round but square, and did not possess smooth interiors. The cost of the Maltese Cross brand was 3s. 7d. per ton. The plaintiff's process would cost £1 5s. at least. The witness then gave details as to how he arrived at these figures.

Mr. Harvey, a partner in the defendants' firm, said that he came to the conclusion that it was a purely ideal, dreamy contract, and utterly impossible to carry out with their plant. The process had been kept a secret and not disclosed to anyone until this action was brought. The cost would be far above that of producing their oil known as the Maltese Cross brand.

Expert evidence then followed, to the effect that the process was impossible to carry out practically; that absolute cleanliness was essential, which was impossible to obtain at defendants' works as at present constructed; and that the cost would be greatly in excess of that stipulated for by the plaintiff.

After the speeches of counsel,

The learned judge, in summing up, said that the action was simply one to recover damages for breach of contract. There was really no charge of fraud or misconduct involved. The parties had put into writing the terms of the contract they made, and it was to that they must look. Only when there was doubt as to the meaning of terms used in a written contract could evidence be heard as to the intentions of the parties. It was much to be regretted that the plaintiff had not seen the plant and machinery in use at the defendants' works before agreeing to produce a process to take the place of the one used by the defendants, and capable of being worked with the existing plant, and to cost not more than 2s. per ton. The defendants, directly they had an opportunity of reading the manuscript book of instructions, rescinded the contract, and said in effect they were not going to attempt that which was impossible. If they were right in the view they took they were entitled to a verdict; if they were wrong they must pay damages.

The jury retired at 3 p.m., and at 6.45 were discharged without arriving at a verdict.—*Times*.

## Reviews and Notices of Books.

**YEAR-BOOK OF PHARMACY**, comprising abstracts of papers relating to Pharmacy, Materia Medica, and Chemistry, contributed to British and Foreign journals from July 1, 1892, to June 30, 1893.*

This useful compendium of information on subjects of investigation connected with pharmacy has this year been published earlier than usual, and although it has ninety pages less than the last volume issued, it contains an excellent *résumé* of the work done during the period to which it relates. The report of the transactions of the Pharmaceutical Conference at Nottingham occupies, with the list of members, nearly one half of the volume, and the remainder is devoted to abstracts of papers on chemistry, materia medica, and pharmacy, with a general introduction giving a *résumé* of the various investigations recorded under those heads. Although a publication of this kind must necessarily be a reproduction, to a great extent, of matter which has already found a place in one or more of the numerous periodicals now issued, it is very convenient to have the facts collected together in a form admitting of ready reference. In this respect the present 'Year-Book' shows that the effort to carry out condensation of the abstracts has been very successful, and contributes to the usefulness of the volume, for while the main features of the papers are sufficiently stated for the needs of a general reader, the references given to the original sources will enable anyone requiring fuller information to obtain what is desired. Certainly the 'Year-Book' is a very useful source of information for pharmacists upon many matters connected with their every-day work, and it ought to be in the possession of everyone engaged in the practice of pharmacy.

**ANNALES DE L'INSTITUT BOTANICO-GEOLOGIQUE COLONIAL DE MARSEILLE, PUBLIÉES SOUS LA DIRECTION DE M. LE PROFESSEUR EDOUARD HECKEL.**†

This is the first of a series of volumes which will unquestionably prove of great value not only to French commerce but also to that of other countries. The subjects treated in it are not entirely new, the first being on the kola nut, and the second on odika bread and the fat contained in it. Nevertheless, the Annales contain an exhaustive account of these products, derived from all sorts of publications, including books on travels, floras, medical and botanical journals, and private and official correspondence. Excellent botanical illustrations are given of the varieties of kola and of the kola plants, as well as of the *Irvingia Gabonensis*, from which the odika bread is obtained. From the researches of the author and Dr. Schlagdenhauffen it appears that the false kola nuts which have occurred in European commerce during the last few years, and differ from the ordinary kola nut in having the cotyledons divided into five or six parts, are the produce of a distinct species, which has been named by Dr. Maxime Cornu, *Cola Ballayi*. The seeds have been grown in the *Jardin des Plantes* at Paris, and the seedlings exhibit such differences of habit and botanical detail, that although the *Cola acuminata* is a variable plant, there seems every reason to believe that the false kola is a good species, and not merely a variety, as other botanists who had not seen the plants in cultivation had supposed. An important point in connection with these poly-cotyledonous seeds is that they contain only half the amount of alkaloids present in the seeds of *C. acuminata*, and also only half the amount of albuminoids and kola red (kolanine). On the other hand, they contain twice as much fat. Dr. Heckel is of opinion that there is no chemical body present in the fresh kola that disappears when the seed is dried, but that it acquires on drying a more unpleasant taste, and it is for this reason the negroes prefer it in the fresh state. Illustrations of all the false kolas that have appeared in commerce are given, as well as of other seeds, such as those of *Pentadesma butyracea* and *Heritiera littoralis*, together with all that is known concerning them, so that in reality the Annales constitutes a work of reference concerning more products than appear in the title. With respect to the odika bread and fat from *Irvingia Gabonensis*, Baill., it appears that from 48 to 70 per cent. of fat can be obtained from the decorticated seeds, and that this fat consists of laurin and myristin. A similar product, but less rich in fat, is obtained from *Irvingia Olivieri*, Pierre, in Cochin China, where it is known as "Cay-cay." Another species, *I. Malayana*, Oliver, also passes under the same native name, but it yields much less fat. The Annales, if continued in their present form, and containing as exhaustive an account of other African products, will become necessary for reference to every African merchant, and are certain to find a place in the library of all colonial institutes and commercial museums. A notice is contained in this volume that the Société d'Acclimatisaton de France offers a prize in 1896 of 500 francs to anyone who shall have introduced the kola plant into the French tropical colonies, and obtained the seeds.

## Obituary.

Notice has been received of the death of the following:—

On January 6, William Walker, Chemist and Druggist, of Louth, Lincs. (Aged 75 years).

On January 15, Cornelius Williams, Pharmaceutical Chemist, of Pembroke Dock. (Aged 63 years). Mr. Williams had been a member of the Society since 1865, and at the time of his death held the office of local secretary. He was clerk to the local Burial Board, and an active member of the Chamber of Commerce of his town, where he was held in high esteem.

On January 18, Walter Bevis, Pharmaceutical Chemist, of Ryde, I. W. (Aged 36 years). Deceased had been a member of the Society for twelve years, and was possessed of considerable attainments, especially on the botanical side of pharmaceutical knowledge. He was an enthusiastic collector of botanical specimens, which he readily placed at the disposal of any *confrère* interested in botany. A neglected cold was the cause of Mr. Bevis' early death.

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* London: J. and A. Churchill. Pp. 470. 10s.

† Paris: Société d'éditions scientifique. Pp. 848, with plates.

## Correspondence.

### METHYLATED SPIRIT—A CAUTION.

Sir,—The evidence adduced at a recent coroner's inquest upon the unfortunate victim of a snapdragon accident induced me to infer that methylated spirit as now made with mineral naphtha (in accordance with the general order of the Board of Inland Revenue, July 20, 1891) might give off naphtha vapour at ordinary temperatures, which, mixing with the confined air contained in a vessel only partially filled with the methylated spirit, produced a dangerous explosive mixture; that this inference is correct I have confirmed by experiment, and desire to indicate to brethren in the trade, and through them to purchasers of the spirit, this latent source of danger, as it requires more care than is often bestowed to avoid the proximity of flame to the open mouth of any such containing vessel.

*Dover.* ALEX. BOTTLE.

### MALAYAN ARROW POISONS.

Sir,—With reference to Mr. Thiselton Dyer's note in the Journal of January 20 regarding the botanical origin of the Malayan arrow poisons, the action of which I recently described, allow me to say that I had read the very interesting account given in the *Kew Bulletin* for 1891. Later, in the Journal of November 12, 1892, Mr. E. M. Holmes gave reasons for believing that the plants in question had not been correctly identified. As I have not seen any contradiction of his statements I took them to be correct, and said accordingly that the species had not been identified. As I really know very little about the matter I have referred it to Mr. Holmes himself.

*Edinburgh.* RALPH STOCKMAN.

Sir,—Dr. Stockman has referred to me as the authority for his statement that the botanical source of the Malayan arrow poisons, "Ipoh aker," "Ipoh Lampong," and "Prual," are unknown. My reasons for the statement are given in the *Pharm. Journ.*, [3], xxiii., pp. 388, 389, but as Mr. Dyer does not appear to have observed my remarks on the subject, I may, perhaps, be allowed to briefly recapitulate them. Wishing to verify Dr. Stapf's identification, I compared the specimens in the Society's Museum with the specimens of the plants named by Dr. Stapf in the Kew Herbarium, and feeling doubtful of the identification, I showed the two *Strychnos* plants to Dr. C. B. Clarke, who is the author of the species, *S. Maingayi*, Clarke ('Fl. Brit. Ind.,' Vol. iv., p. 88), and he considered them not to be that species, and agreed with me that one of them was nearer *S. Wallichiana*, Hook. f. and Thoms. I then showed them to Dr. Geo. King, who happened to be working in the Herbarium, and who is engaged, I believe, on a flora of the Malay Peninsula, and he said the plants were, he believed, new. The fact that the root bark of the two species of *Strychnos* is said by the Malays to differ in colour, and that Dr. Stockman has now shown that they differ in physiological action is, I think, taken in conjunction with differences in the leaves, sufficient evidence to show that the two *Strychnos* plants are probably distinct. With regard to "Prual," I have received no specimen of the leaves from Mr. Wray, but I have seen the specimens in the Kew Herbarium, referred by Dr. Stapf to the genera *Urophyllum* or *Lasianthus* (Rubiaceæ). This, I understood him to say, he was led to do by the presence of interpetiolar stipules and the character of the leaves. Although strongly resembling the plants of the genera in question, I considered the evidence insufficient, inasmuch as interpetiolar stipules occur in the *Urticaceæ* and *Euphorbiaceæ*, etc., two natural orders even more likely to contain a powerful poison than Rubiaceæ. I was further confirmed in my doubts by receiving the information from Professor Radlkofer, of Munich, to whom I had sent specimens of the root for histological examination (and whose knowledge of plant structure is of the very first rank), that
[illegible]" was "certainly not a Rubiaceous plant."
cross-e[illegible] evidence I had obtained did not agree with the
ton as [illegible]s in the *Kew Bulletin*, I preferred not to allude
required. [illegible]ifications there given, although in my paper I
Mr. Aller[illegible]argely from the same *Bulletin* on other points.
past presiden[illegible]

In the meanwhile the exact species yielding the poisons must remain unsettled until flowers and fruits of the plants are obtained.

*17, Bloomsbury Square.* E. M. HOLMES.

## Answers to Correspondents.

*East York.*—We are officially informed that the General Order of the Board of Inland Revenue bearing upon this subject, quoted in the Calendar of the Pharmaceutical Society, "is still in force, and, with the Board's permission, the liniments therein enumerated can still be prepared with methylated spirit." The supervisor, therefore, is evidently in error.

*W. A. K.*—The *Journal de pharmacie et de chimie* is one of the best French publications of the kind. It is published twice monthly, and the subscription price, out of France, is 17 francs per annum.

*R. Collingwood.*—Since the alkaloid is known to possess toxic properties, and all poisonous vegetable alkaloids and their salts come within Part I. of the Schedule, we think you would be justified in dealing with it accordingly.

*A. M. Shepherd.*—The book you mention is one of the best available. There is no really good work of recent date on the subject.

## Notices of Meetings next Week.

### MONDAY, JANUARY 29.

*Imperial Institute*, at 8 p.m.
"The Resources of British East Africa," by W. W. A. Fitzgerald.

### TUESDAY, JANUARY 30.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (second lecture), by Professor C. Stewart.
*Edinburgh District Chemists' Trade Association*, at 9 p.m.
Bi-Monthly Meeting.

### WEDNESDAY, JANUARY 31.

*Edinburgh Chemists' Assistants' and Apprentices' Association*, at 9.15 p.m.
Apprentices' Night, conducted by John Lothian.
*Sheffield Pharmaceutical and Chemical Society*, at 8 p.m.
"The Scottish Alps" (illustrated), by W. Lamond Howie.

### THURSDAY, FEBRUARY 1.

*Chemical Society*, at 8 p.m.
"Note on the Liberation of Chlorine by the Interaction of Potassium Chlorate and Manganese Dioxide," by Professor McLeod.
"An Examination of some Recent Freezing Point Determinations," by S. U. Pickering.
"The Salts of Dehydracetic Acid," by Dr. Collie and H. B. Le Sueur.
"A New Method of Preparing Carbon Tetrabromide," by Dr. Collie.
*Linnean Society of London*, at 8 p.m.
"On the Morphology of the Pedipalpo," by Malcolm Laurie.
"On the Freshwater Algæ of the West Indies," by W. West.
*Chemists' Assistants' Association*, at 9 p.m.
Musical and Social Evening.
*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
"The Human Hand," by Dr. T. H. Bryce.
*London Institution*, at 6 p.m.
"Some Optical Phenomena" (illustrated), by Shelford Bidwell.

### FRIDAY, FEBRUARY 2.

*Royal Institution*, at 9 p.m.
"Bookbinding," by T. J. Cobden-Sanderson.

### SATURDAY, FEBRUARY 3.

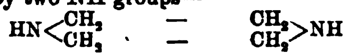
*Pharmaceutical Football Club* v. St. Michael's, at Shepherd's Bush, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennett, Blackburn, Hill, Laing, Thompson.

## "THE MONTH."

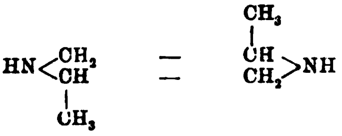
**Methylamine and Ethylamine.** Trillat and Fayollat describe a new method of preparing these compounds, which depends upon the reduction of ammoniacal compounds of formaldehyde and acetaldehyde. On mixing aqueous solutions of formaldehyde and ammonia, a compound is formed which is now said to have the composition $N_2(CH_2)_3$. This compound may be obtained in hexagonal needles, but in the present process the solution containing it is treated with zinc dust and hydrochloric acid, and subsequently with caustic alkali. Methylamine is thus liberated, and, with the excess of ammonia, is carried by a current of steam into dilute hydrochloric acid. The acid solution is then evaporated, and methylamine hydrochloride, mixed with ammonium chloride, is left. Absolute alcohol is used to extract the former, and on subsequently treating it with caustic alkali pure methylamine is obtained. In a similar way ethylamine may be prepared from acetaldehyde and ammonia (*Bull. de la Soc. chim. de Paris*, [3], xi., 22).

**Lycetol.** Under this name a body, which may be represented as dimethylpiperazine tartrate, has been introduced for therapeutic use by Bayer and Co., of Elberfeld. It is described by Hermann Wittzack in the 'Allg. Medizin Central Zeitung' as having little action upon the human organism, but as having at least the same solvent action on uric acid as piperazine itself. It is stated that the administration of lycetol is followed by considerable increase of diuresis, with reduction of the specific gravity of the urine. Long continued use of this substance does not produce any disturbance of the system, but gouty symptoms are relieved by it. Thoms points out that, regarding piperazine as constituted of two ethylene residues united by two NH groups—



$$HN{<}\begin{matrix}CH_2\\CH_2\end{matrix}\quad\begin{matrix}-\\-\end{matrix}\quad\begin{matrix}CH_2\\CH_2\end{matrix}{>}NH$$

or as diethylenediamine, the base in lycetol may be represented as constituted of two propylene residues united in a similar manner by two NH groups—



$$HN{<}\begin{matrix}CH_2\\CH\\|\\CH_3\end{matrix}\quad\begin{matrix}-\\-\end{matrix}\quad\begin{matrix}CH_3\\|\\CH\\CH_2\end{matrix}{>}NH$$

or as dipropylenediamine, dimethylpiperazine being derived from propylene in the same manner that piperazine is derived from ethylene. Many years ago the mode of producing these diamines was shown by A. W. v. Hofmann, and the dipropylene compound has since been prepared by H. Strache according to Hofmann's method, but the yield obtained was small. It is probable, therefore, that Bayer and Co. have found a more advantageous mode of production (*Apot. Zeit.*, ix., 76).

**Hyoscine Hydrobromate.** Dr. Gordon Sharp has studied the clinical effects of this compound, working with a sample of undoubted purity, and finds that they differ little from those of atropine. He considers, however, that until more is known of the chemistry, pharmacology, and clinical effects of hyoscine, it can hardly be recommended as a safe hypnotic (*Practitioner*, lii., 22).

**Glucosides of the Alcohols.** E. Fischer has observed that when a solution of grape sugar in methylic alcohol is saturated with hydrochloric acid gas, it loses the power of reducing Fehling's solution, and a crystallisable product is formed, having the composition $C_6H_{11}O_6{\cdot}CH_3$, as the result of a reaction represented by the equation—

$$C_6H_{12}O_6+CH_3OH=C_6H_{11}O_6{\cdot}CH_3+H_2O.$$

The same reaction takes place with all kinds of alcohols capable of dissolving sugar, and the compounds formed correspond to natural glucosides. They are not altered by Fehling's solution, phenylhydrazin, or boiling potash solution, but when boiled with dilute acid they assimilate water, and are converted into sugar and alcohol. Some of these artificially produced glucosides have a sweet taste and others a bitter taste. It is not improbable, therefore, that some natural glucosides may be compounds of the same kind (*Berichte*, 26, 2400).

**Chloralose and Parachloralose.** In a supplementary communication regarding these substances (see *Pharm. Journ*, [3], xxiii., 609) Hanriot and Richet describe the first-named as slightly soluble in water and in ether, more so in alcohol, and melting at 187°. The aqueous solution does not reduce silver nitrate nor Fehling's solution, even when boiling. Dilute acids fail to decompose it, and nascent hydrogen is also without action upon the solution, but alkalies colour it brown on warming. Concentrated acids or their chlorides act upon chloralose, forming di- and tetra-substituted ethers. Tetracetyl-chloralose, $C_8H_7Cl_3O_2(C_2H_3O_2)_4$, melts at 145°; tetrabenzoyl-chloralose forms prisms which fuse at 138°. By oxidation chloralose is converted into chloralic acid, $C_7H_9Cl_3O_6$, with loss of carbon dioxide. The acid crystallises in anhydrous needles, which fuse at 212°, are soluble in alcohol or ether, and slightly so in water. All these derivatives of chloralose are physiologically inactive. Parachloralose is distinguished from the former compound by its insolubility generally; it melts at 227°, and sublimes if heated gently. Alkalies attack it on boiling, but not powerfully. Like chloralose, it is unaffected by hydroxylamine, phenylhydrazin, and dilute acids, and it gives di- and tetra-substituted ethers under similar conditions. Tetracetyl-parachloralose, $C_8H_7Cl_3O_2(C_2H_3O_2)_4$, occurs as long needles, melting at 106°, and boiling near 250° under a pressure of 25 Mm. It can be distilled at the ordinary pressure, but is coloured yellow during the operation. Tetrabenzoyl-parachloralose has not yet been obtained in the crystalline state. By oxidation of parachloralose, parachloralic acid, $C_7H_9Cl_3O_6{\cdot}2\,H_2O$, is formed, and $CO_2$ given off. This acid melts at 202°, is slightly soluble in cold water, and very soluble in alcohol or ether. It crystallises in efflorescent tablets (*Comp. rend.*, cxvii., 734).

**Cuprous Oxide.** E. J. Russell refers to the difficulty frequently experienced in decanting or filtering when preparing cuprous oxide by the ordinary method, and suggests the following modified process:—A mixture of copper sulphate with excess of sodium chloride is dissolved in water so as to form a fairly concentrated solution. Sulphur dioxide gas is now passed through to saturation, the cupric chloride formed being held in solution by the excess of sodium chloride. The sulphur dioxide is then expelled by heat, solid sodium carbonate added while the solution is hot, and a beautiful bright red precipitate of cuprous oxide settles speedily, and can readily be washed by decantation (*Chem. News*, lxviii., 308).

**A New Sulphide of Carbon.** A. E. Tutton describes a new liquid sulphide of carbon, isolated in the laboratory of the University of Buda-Pesth, by Professor von Lengyel. The liquid has a specific gravity of 1·2739, and when heated it polymerises into a hard black substance. Analyses of the liquid and solid indicate the same empirical formula, $C_3S_2$, for both. The liquid can be only partially distilled *in vacuo*, and in a few weeks it spontaneously changes into the more stable black solid. It readily ignites, and is dissolved by caustic alkalies, as well as by 70 per cent. nitric acid. The liquid sulphide combines readily with six atoms of bromine, and the compound formed, $C_3S_2Br_6$, has, curiously enough, a pleasantly aromatic odour (*Nature*, xlix., 275).

**Decomposition of Solutions by Silica.** At a recent meeting of the Birmingham Philosophical Society, Dr. G. Gore described the results of experiments in which solutions of acids, alkalies, or salts, having no chemical action upon pure precipitated silica or other suitable insoluble powder, were agitated in stoppered bottles with the powder, set aside for some time, and the clear liquids subsequently analysed. It was found that the power of abstracting dissolved substances from liquids is a common property of finely divided solid bodies, and that the amount abstracted varies with the kind of powder employed; with the degree of fineness and, consequently, the amount of surface of the powder; with the kind of substance dissolved; the proportion of powder to dissolved substance; the kind of solvent; the proportion of solvent to powder; the proportion of dissolved substance to solvent; and, to some extent, with the temperature. Finely precipitated silica possesses the property of abstraction in the greatest degree, and alkaline substances in solution are most affected, silica abstracting more than 80 per cent. of the dissolved substance in very dilute alkaline solutions. The results obtained with silica and a very weak solution of iodine are said to indicate a possible method of extracting the latter from solutions and afterwards recovering it from the silica by distillation (*Nature*, xlix., 272).

**Inertness of Quicklime.** V. H. Veley finds that dry chlorine does not combine with dry lime, at ordinary temperatures, to form bleaching powder. No appreciable change is observable in the two substances below a temperature of 300°, when a partial replacement of oxygen by chlorine takes place; the reaction being analogous to that occuring between baryta and chlorine, not specially dried, and at ordinary temperatures (*Journ. Chem. Soc.*, ccclxxiv., 1).

**New Isomer of Cinchonine.** Jungfleisch and Léger describe a novel isomer of cinchonine, which they name *cinchonine δ*. It is obtained by continued boiling of an alcoholic solution of dibromhydrate of hydrobromocinchonine and subsequent separation from the other bases present. When slowly crystallised from ether it forms long prisms, which are insoluble in water, but freely soluble in alcohol, benzin, chloroform, or acetone. The base melts at 150°, and is dextrogyre; its rotatory power, measured at 17°, being $a_D = + 125°·2$. It forms a hydrochlorate and hydrobromate, which each occur as small prisms, and contain 1·5 and 2 molecules of water respectively; and an oxalate containing five molecules of water of crystallisation, which forms fine needles. Solutions of cinchonine δ or of its salts become coloured rapidly on exposure to air and light, the brown coloured products of the change being much less alkaline than the base itself (*Comp. rend.*, cxviii., 29).

**Sublimate Solutions.** Vignon points out that the antiseptic value of aqueous solutions of corrosive sublimate depends upon their preservation in an unchanged condition, and he is of opinion, after performing numerous experiments and calculations, that great changes in strength may take place on keeping, an insoluble precipitate being gradually deposited. The presence of hydrochloric acid or of alkaline chlorides retards this process considerably, and colouring matters such as indigo-carmine and fuchsine appear likewise to exert a preservative influence. Tanret, criticising these results, considers that the precipitate of mercury amido-chloride is caused by ammonia vapour in the atmosphere, independent experiments having convinced him that mere exposure of aqueous sublimate solutions to the air causes no such change (*Comp. rend.*, cxvii., 793 and 1081).

**Permanganate as an Antidote to KCy.** J. Kossa, considering that potassium permanganate ought, theoretically, to act as a chemical antidote to potassium cyanide, by checking the paralysis of the respiratory centres, has performed some experiments, the results of which appear to fully justify his hypothesis. Rabbits were shown to be fatally affected in a few minutes by 0·01 Gm. of the poison, but if, at the time of administration, 0·5 Gm. of permanganate dissolved in 50 C.c. of water was also introduced into the stomach, doses of cyanide up to 0·1 Gm. failed to cause death. Larger quantities (0·2 Gm.) proved fatal under similar conditions, but the action of the poison was much delayed. Successful experiments were also performed with aqueous solutions of hydrocyanic acid containing 0·1 per cent. It is suggested, therefore, that, in cases of cyanide poisoning, ½ to ⅓ litre of a 3 to 5 per cent. solution of permanganate be administered immediately (*Vratch*, through *Nouv. rem.*, ix., 567).

**Diiodoform.** This is described by Maquenne and Taine as a definite iodide of carbon—ethylene periodide, $C_2I_4$—prepared by treating acetylene periodide, $C_2I_2$, with iodine in excess. It is insoluble in water, but soluble in chloroform, carbon bisulphide, benzin, etc., and slightly so in alcohol or ether. It crystallises in fine yellow prismatic needles, very different in appearance to those of iodoform. It melts at 192°, is almost inodorous, and is recommended as a substitute for iodoform for antiseptic purposes. Exposure of the compound to light appears to result in dissociation to some extent, and it is accordingly recommended that it be kept in yellow or red glass bottles (*Répertoire*, [3], v., 529).

**Ferratin.** This is the name given to a substance isolated from pig's liver by Schmiedeberg. It contains, on the average, six per cent. of iron, and is regarded as the only organic iron-compound normally present in the organs of the animal body, being ingested with food and stored up in the tissues as a reserve material for the formation of blood. The natural ferratin being difficult to obtain in quantity, the compound is prepared artificially by treating egg albumin, dissolved in water, with the tartrates of potassium and iron, together with soda lye. The resulting precipitate is described as a reddish-brown, inodorous, and tasteless powder, of neutral reaction, and containing seven per cent. of readily assimilable iron. A sodium compound of ferratin is also prepared, which is soluble in water. The dose of either form is, for children, 0·1 to 0·5 Gm. daily, and, for adults, 1 to 1·5 Gm., divided into two or three portions (*Practitioner*, li., 427, and *Répertoire*, [3], vi., 21).

**Calomel Soap.** This is recommended by Watrazewski as possessing many advantages over mercurial ointments. It is prepared by blending the fumes of calomel with potash soap in the proportion of one to two or one to three. Two to three grammes should be used daily (*Rev. des sciences med.*, and *Journ. de pharm.*, [5], xxix., 77).

**Rhodinol and Camphene in Essential Oils.** Monnet and Barbier have separated rhodinol, which constitutes the odorous principle of otto of roses, from the essential oil of pelargonium. The figures and reactions obtained on analysis of the compound seem to indicate its complete identity, both physically and chemically, with that from the better known source. Bouchardat affirms the existence of a dextrogyre camphene in the oil obtained from *Lavandula spica*, and Oliviero finds a similar compound in that from wild valerian (*Comp. rend.*, cxvii., 1092–4–6).

**Formalin and Gelatin.** Dr. C. Gegner some months ago pointed out that not only do formalin solutions exercise a bactericidal action, but formalin vapour is powerfully antiseptic and affects the melting of gelatin exposed to it. Dr. G. Hauser, referring to this communication, shows that such gelatin cannot be liquefied, even by the heat of a bunsen flame or on boiling in soda solution. Being strongly antiseptic, too, no organisms will grow upon it. He takes advantage of these peculiarities in preparing colonies of bacteria for microscopic examination. A thin film of gelatin, in which a particular growth is present, is placed on a glass slide, covered with thin glass, and the cover sealed by a ring of melted gelatin. The preparation is then exposed to formalin vapour for twenty-four hours, after which the gelatin is quite solid and unalterable. By previously immersing the gelatin film in weak aqueous fuchsine solution, the bacteria are stained sufficiently to contrast with the surrounding medium, which is much more faintly coloured (*Münch. med. Woch.*, xl., 599 and 655).

**Myrosin in Plants.** On examining the Tropæolaceæ, on similar lines to the Capparidaceæ (see *ante*, p. 344), L. Guignard finds that all the organs of plants in this order contain myrosin. It is localised in cells distinct from those containing the glucoside, which it decomposes with the formation of the essential oil peculiar to this family. It is shown, also, that the essential oil does not preexist in the tissues, and cannot be formed without the action of the ferment, so that there is a complete analogy, in this respect, between the Tropæolaceæ, Cruciferæ, and Capparidaceæ. He also finds that a specialised ferment exists in the cells of various organs of plants belonging to the Limnanthaceæ. The nature of the ferment is the same as in the previously mentioned families, and the accompanying glucoside is acted upon under similar conditions. The Resedaceæ also contain an analogous ferment in roots, stems, and leaves (*Comp. rend.*, cxvii., 587, 751, and 861).

**Localisation of Active Principles.** L. Braemer has made a micro-chemical examination of the *Bryonia dioica*, *Citrullus Colocynthis*, and *Ecballium Elaterium* (Cucurbitaceæ), with a view to localising the bryonin, colocynthin, and elaterin present in their tissues. The colour reactions given by these compounds with sulphuric acid (pure or combined with phenol), ammonium molybdate or vanadate, and silver nitrate, were utilised for this purpose. In the case of bryony and colocynth, the material was preserved in ether, in which the respective active principles are insoluble. The reagents were not applied direct, but placed at the edge of the cover-glasses over the sections and allowed to penetrate by capillary attraction. In the elements of the tissues containing the active principles, the presence of the latter was clearly indicated by a red coloration, and longitudinal sections made through the different organs of the plants showed that these elements correspond to the sieve tubes described by Fischer as having ceased to exercise their special function and lost their typical structure. In the three species examined these vessels occupied chiefly the periphery of the liber, but they were also found in the cortical parenchyma, the pericycle, and the fundamental parenchyma (*Comp. rend.*, cxvii., 753).

**Localisation of Nicotine in Tobacco.** Dr. G. B. De Toni has published the results of histochemical researches on *Nicotiana Tabacum*, and other species of the genus. He finds the alkaloid, $C_{10}H_{14}N_2$, to be located chiefly in the epidermal tissues. It is absent from the seed and the young plant. In the root of the mature plant it occurs in the cortical tissue, and especially in the layer of cells immediately beneath the epidermis. In the branches, leaf-stalk, lamina of the leaf, peduncle, calyx, and corolla, it is almost entirely confined to the epidermal cells, and occurs especially in those at the base of the hairs. It is found also, in smaller quantities, in the anthers and pistil. The mesophyll and assimilating tissue of the leaf gave uniformly negative results. Nicotine does not appear to exercise any protective influence on the tobacco plant, since both the fresh and the dried leaves are devoured by many insects. The author believes its function to be simply excretory; it is a product of the reduction of oxygenous substances. The following are given as the best chemical tests for nicotine:—The double iodide of potassium and mercury; iodised iodide of potassium; tannic acid; tetrachloride of platinum; iodised iodic acid; Dragendorff's reagent; trichloride of gold (*Ricerche istochimiche preliminari sulla pianta del tabacco*, Venezia, 1893).

**Desiccation of Starch.** Bloch asserts that the desiccation of starch is incomplete at temperatures under 160°, and meets the objection that dextrin may be formed at 100° to 110° by stating that this is not so except in the presence of acids or other compounds that assist in the transformation. The pure and natural starch is said to remain unaltered at that temperature, except that a certain amount of the water originally present in the grains is of course dissipated (*Comp. rend.*, cxviii., 146).

**Structure of Root Hairs.** T. Jamieson finds that careful examination of the tips of root hairs reveals the presence of a well-defined aperture with lips in the case of every plant of a large number examined during three years. Very careful manipulation and focussing of the light are necessary to detect this, in addition to persistent observation, and the hairs must also be in a favourable position. The aperture is usually at the point, but is sometimes a little below, the point then forming a kind of cap. The apertures vary considerably in shape and position, being usually circular and tapering inwards. Sometimes, however, the opening is transverse, the tip of the root seeming half curved, the aperture then appearing slightly at one side, and the tip like a lip or knob (*Science*, xxii., 354).

**Secretion of Oil and Resin.** A. Bécheraz has studied the conditions under which oil or resin is secreted in secretion-ducts. He finds that these ducts are lined with a mucilaginous layer, which he regards as arising from the outer surface of the cell wall, in which the formation of resin takes place. This lining he has found in the secretion-ducts of Compositæ, Coniferæ, Umbelliferæ, and other natural orders (*Archiv.*, 231, 653).

**Curcin.** A. Siegel finds in the seeds of *Jatropha Curcas*, L., a poisonous principle, curcin, which he considers analogous to ricin, and places in the class of toxalbumins (*Bot. Centralblatt*, xlvii., 120).

**Distinctions between Catechu and Gambier.** Gibson points out how catechu from *Acacia Catechu* and that (gambier) from *Uncaria Gambier* may be distinguished by microscopic examination. Depending upon the fact that the latter is prepared from young stems bearing leaves and flowers, whilst the black catechu is obtained from the duramen or inner wood of the trunk, he seeks for the different anatomical elements accidentally present in the extracts. The material is dissolved by means of alkali or thirty per cent. acetic acid, and the insoluble residue is then submitted to careful examination. In that from black catechu, woody fibres and large pitted vessels may be detected, and sometimes hairs from the leaves in which the extract has been wrapped, but never any dissociated parenchymatous cells, such as are found in the residue from gambier, in which hairs from the calyx and corolla of the flower of *U. Gambier* may also be distinguished (*Bull. de l'Acad. de med. de Belg.*, through *Répertoire*, [3], v., 533).

**Podophyllin Resin.** G. M. Beringer corrects certain errors in the new U.S.P. with regard to the action upon this resin of solvents. It is there stated that ether dissolves 15 to 20 per cent. of podophyllum resin, and boiling water about 30 per cent., most of which, however, is deposited again on cooling. A fresh sample of the resin was prepared to test these statements, the yield being equivalent to 3·9 per cent. of the rhizome used. The product had a greenish-brown colour, with a slight tinge of yellow. It was soluble in ether (U.S.P., 1890) to the extent of 82 per cent., chloroform dissolved 70 per cent., and boiling water took up about 22 per cent., which was mostly deposited again on cooling. Ethyl, methyl, and amyl alcohols dissolved the resin readily; solutions of caustic alkalies left a slight residue; carbon disulphide and acetic acid dissolved it partly; glacial acetic acid entirely; benzin and benzol minute traces only; and turpentine none (*Am. Journ. Pharm.*, lxvi., 9).

**Tragacanth at Bagdad.** According to a recent Foreign Office report on the trade of Baghdad and Bussorah, there has been a considerable increase in the trade in tragacanth, which comes from Persia and Sulimania. The supply has been large, and everything brought to market was eagerly bought up, owing to the high prices ruling in the London market. Tragacanth was almost unknown in the district some years ago, but now it is one of the principal exports of the country, and promises to become of greater importance every year (*F. O. Annual Series*, 1320).

**Analysis of Arrowroot.** F. Watts, of the Government Laboratory, Antigua, gives the results of the analysis of the ash of ripe St. Vincent arrowroot. The fresh root, when cleaned and scaled, yielded 1·219 per cent. of pure ash, carbon dioxide being deducted. This ash contained silica, 9·73 per cent.; phosphoric anhydride, 12·24; sulphuric anhydride, 6·39; chlorine, 6·48; oxide of iron, 0·22; alumina, 0·13; lime (CaO), 3·18; magnesia, 5·39; potash, 54·06; soda, 2·14. From these figures it is estimated that a fair crop of arrowroot would remove from the soil about 80 to 90 lbs. of potash per acre. It is suggested that this should be replaced by a chemical manure, which should also contain relatively small amounts of phosphate and nitrogen (*Kew Bulletin*, 84, 360).

**Caoutchouc from Mimusops.** Holle directs attention to the growing importance of the various species of *Mimusops* as sources of caoutchouc. All the Sapotaceæ yield a milky juice containing caoutchouc, and plants belonging to the natural order are found throughout the whole of the southern hemisphere. He considers the milky juice to be a reserve material capable of being utilised should necessity occur (*Archiv.*, 231, 667).

**Scopola Carniolica.** In continuing the study of scopola roots, Professor E. Schmidt has examined a drug occurring in commerce under the designation of *radix Scopola Carniolica*. The chemical nature of its constituents has not been found essentially different from those formerly obtained from the roots of *Scopola atropoides*, *S. Japonica*, and *S. Hladnickiana*. He has, however, found in this drug cane sugar, and thinks it may probably be present in other kinds of scopola root (*Apot. Zeit.*, ix., 6).

**Recent Drugs.** Several parcels of loose kousso flowers have lately been offered in the London market. In addition to the broken female flowers, the drug has usually contained a considerable admixture of male flowers, which can easily be recognised by their small size, rounded appearance, and by their containing numerous well-formed stamens. Carthagena ipecacuanha has also appeared mixed with a noticeable quantity of *Psychotria* root, the cortex of which is usually soft and moist, purplish in colour, and seldom brittle.

The Pharmaceutical Journal

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*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## WHAT IS THE PHARMACEUTICAL MEANING OF THE TERM "PREPARATION."

THE technical meaning of the term "preparation" in connection with medicine and pharmacy will be sufficiently well understood by readers of this Journal not to require explanation so far as they are concerned, and it would have been unnecessary on their account to enter into any consideration of its correct significance and use. But in several instances when questions relating to the Pharmacy Act have been the subject of legal inquiry, difficulties have arisen in this respect, or it may be said that they have been created by the acuteness of the legal mind, which sometimes seeks to establish distinctions where there is really no difference. That tendency was conspicuously evident in the defence of the PIPER case, where it was argued that a preparation of a poison is not only something different from the poison itself pure and simple, but is also different from a medicinal "compound" into which the poison enters as one of its ingredients. The object of the attempt to establish that view was to obtain an admission of the argument that, since compounds into which poisons enter as ingredients are not specifically mentioned in the schedule of the Pharmacy Act, they should be dealt with, under the provisions of that Act, in a manner different from that applicable in the case of preparations of the poisons which are expressly included in the schedule. In short, it was argued that a "compound" into which poison enters as an ingredient being a different thing from a preparation of that poison, the compound is not subject to the provisions of the Act, notwithstanding the presence in it of a scheduled poison.

If there were any ground for the view thus put forward, a considerable number of medicinal compounds which contain scheduled poisons as ingredients would be outside the operation of the Pharmacy Act, and that is the object which the propounders of this view seek to arrive at. But there is not, in fact, any kind of foundation for the assumed difference between a compound and a preparation, and the argument based upon that assumption is entirely fallacious. This may be ascertained by reference to the British Pharmacopœia, which is the standard authority in regard to the treatment of drugs and medicinal agents for rendering them applicable for therapeutic use. There, and in various other pharmaceutical works, it will be seen that directions are given for preparing medicines from, or with, the several articles of the materia medica. The preparations so made are the forms in which drugs or some portions of them, and medicinal agents, are adapted for administration as medicines. These preparations are in most instances compound in their nature, consisting of a drug or some portion of a drug, or of a medicinal agent, mixed with other ingredients, or in some instances chemically combined with other substances. Taking, for example, the familiar drug senna, it is not in the natural condition suitable for administration as medicine, but it is the source from which six official preparations are made. One of the most simple of them is the infusion, which consists of that portion of senna leaves which is soluble in water, and of the similarly soluble portion of ginger. It is a compound or mixture of these ingredients with water. The tincture of senna, again, is a compound of the portions of senna leaves and of three other drugs soluble in proof spirit. The compound mixture of senna is a preparation consisting of a mixture of other official preparations with magnesium sulphate. Each of these compounds may be described as a preparation of any one of their ingredients. Thus infusion of senna is both a preparation of senna and a preparation of ginger. In like manner the tincture is not only a preparation of senna leaves but also a preparation of carraway fruit or of coriander fruit, and even of raisins. These medicinal compounds are so described in the British Pharmacopœia, and the same rule is observed throughout with other official preparations. It is evident, therefore, from that authority that a medicinal compound is properly describable as a preparation of any one of the drugs or medicinal agents which enter into its composition as ingredients. In ordinary practice, however, it is customary to define medicinal compounds as preparations of those ingredients which are of chief importance in regard to therapeutic action, and for that reason the infusion, tincture, compound, mixture, etc., of senna are specially called preparations of senna. In this respect the number of ingredients in a medicinal compound makes no difference.

The same rule applies to medicinal compounds which are preparations of the more potent drugs, such as opium, nux vomica, belladonna, and arsenic. The official preparations of opium, amounting in number to twenty-seven, comprise not only the medicinal compounds containing opium or some portion of the drug as an ingredient; but also the official salts of the chief active principle—morphine—to which the therapeutic action of opium is due, and likewise the medicinal compounds into which those salts enter as ingredients. Inasmuch as opium is the only source from which morphine is obtained, all these last named compounds are described as preparations of opium. They are also alternatively and respectively described as preparations of the different forms of morphine which are official in the Pharmacopœia and enter into their composition. To a person imperfectly acquainted with the subject it might appear that some confusion is thus created; but that is not the case. From the medical and pharmaceutical point of view all the preparations of opium are, or may be regarded as, preparations of morphine, inasmuch as that ingredient of opium is the principal source of its therapeutic action. In that respect, therefore, no difference is made in the Pharmacopœia between compounds, such as Dover's powder or compound tincture of camphor, etc., and the two official salts of morphine, although the latter consist almost entirely of morphine, while the other preparations contain comparatively small proportions of morphine. These illustrations, taken from such an authoritative source as the British Pharmacopœia, are sufficient to show that it affords no support whatever to the view that there is any kind of distinction to be drawn between a medicinal compound and a preparation of a drug or medicinal agent, but that these terms are perfectly synonymous as regards the practice of medicine and pharmacy.

The use of the term preparation in the poison schedule of the Pharmacy Act must necessarily be interpreted as being governed by similar considerations. The introduction into the poison schedule of "preparations of morphine," as well as "preparations of opium and of poppies," distinctly points to the intention that all medicinal compounds containing the chief active principle of opium should be regarded as poisons within the meaning of the Act. For that purpose it is quite immaterial whether the morphine present as an ingredient has been introduced into the compound as a morphine salt or in the form of opium. In either case such compounds would come under the head of preparations of opium. They would also come under the head of preparations of morphine, the presence of morphine as an ingredient of the compounds being in both cases the fact of chief importance for the purposes of the Act, as well as in a medical point of view. Under both these definitions such compounds are, in fact, constituted by the Pharmacy Act poisons within its meaning, and the reference to them in that sense is not limited by any consideration of the amount of morphine requisite for that purpose. The importation of such a limit would not therefore be justifiable on any ground, and it would be directly opposed to the intention and object of the Act. These are the points which have to be considered in connection with the facts established by evidence, and the intended beneficial influence of the Pharmacy Act would be frittered away if the technical import of the terms contained in it were disregarded in favour of interpretations which do not take into account the technical bearing of its terms, though they would be appropriate enough in ordinary parlance and in regard to other matters than those to which the Pharmacy Act relates.

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## POISONING IN SCOTLAND.

THE report of the Registrar-General for Scotland just published gives particulars of the cases of poisoning which occurred by accident and otherwise in 1891. The total number of deaths caused by poison was one hundred, or 3·4 per cent. of the deaths caused by violence of various kinds. Of the hundred deaths by poison, twenty-four were cases of suicide and seventy-six were accidental, the cases of accidental poisoning making rather more than 2·84 per cent. of the entire number of deaths caused by accident or negligence, or 1·9 per hundred thousand of the population. That is very nearly the same proportion that the recorded deaths from accidental poisoning in England and Wales bore to the population and to the total deaths from accident and negligence in the same year. It will be seen from these data that, comparatively with other causes of death from accident or negligence, accidental poisoning is of rare occurrence in Scotland, as well as in England and Wales, while suicide by poison is even less frequent. Still the aggregate number of deaths caused by poison shows the propriety of surrounding the supply of poisonous articles with precautionary restrictions.

The particulars recorded in the Registrar-General's report as to the nature of the poisons which were the cause of death by accident furnish additional evidence of the need for restriction of the sale of poisons, and also of the desirability of adding to the poison schedule of the Pharmacy Act some articles which are at present sold without restriction. Opium, or one of its alkaloids or medicinal preparations, occupies, as is usually the case, the most prominent place as a cause of death by accident. The habitual and frequently careless use of such articles in ordinary domestic life is undoubtedly the cause to which the large proportion of accidents must be ascribed, and the circumstances under which such results occur are probably, to a great extent, outside the influence of legislative restrictions of their sale. But the evidence furnished by coroners' inquests shows that many of the fatalities caused by narcotic preparations arise from disregard of the provisions of the Pharmacy Act, and are referable to the practice of selling such articles as secret preparations, without any indication of their dangerous characters. Out of the 76 deaths from accidental poisoning, no less than 27 were caused by some kind of opiate.

Next to opium and its preparations, carbolic acid appears to have been the cause of the largest number of deaths by accident, and immediately following are sulphuric and hydrochloric acids. These three articles are not yet included in the poison schedule, although the Council of the Society several years ago passed a resolution that it was desirable they should be deemed poisons within the meaning of the Pharmacy Act. It is noteworthy that only in two instances has arsenic been the cause of accidental poisoning, and only one case of suicide by arsenic is recorded, while strychnine and phosphorous are stated as the cause of four accidental deaths and two suicides. It may be conjectured that these poisons were obtained in the form of vermin killers, which are still sold without sufficient observance of the precautions required by the Pharmacy Act. Lastly, some twenty cases of accidental poisoning were caused by one or other of twelve different poisons, some of which, such as noxious gases, shell fish, etc., are of an exceptional nature, and in nine instances the poison causing death is not particularised.

Among the suicides by poison, opium and its various preparations again occupy the first place as having been the cause of most deaths, or thirteen out of a total of twenty-four, then follow carbolic acid and strychnine, each as the cause of two deaths, sulphuric acid as the cause of two deaths, and in four cases the nature of the poison is not stated. Even in the case of suicide the comparative infrequent recourse to poison contrasts favourably with the number of instances in which other causes of death are recorded, the total number of suicides being 243, and out of that number 79 were cases of drowning.

### USE OF CHOLESTERIN FAT IN PHARMACY.

It is probable that the mixed cholesterin fat which is abundantly obtainable from sheep's wool will, in the future, come into much more general use as a basis for ointments, liniments, pomades, etc., when the manufacture of this article is improved so as to counteract the tough, waxy consistency which has hitherto been the chief ground of objection to wool-fat. This tenacity of texture is to some extent connected with the melting point of the fat, though it may not be altogether dependent upon the degree of fusibility, and it is claimed that by recent improvements in the manufacture of wool-fat the harder, waxy constituents are removed. The position existing at present as the result of the recent decision of Mr. Justice **Romer** is, however, that of establishing a practical monopoly in favour of the wool-fat sold under the name of "lanolin." Whatever advantage other products may possess, the absence of full certainty that the methods by which they are manufactured would not be held as infringements of the lanolin patent will naturally interfere with the sale of those products. It is reported that the result of the litigation between rival makers of wool-fat in Germany has removed this difficulty. But that circumstance would not affect the question of infringement of the English patent. We understand, however, there is also some probability that the decision in regard to the English patent may be appealed against.

### CORONERS AND THE PHARMACY ACT.

The assistance which can be rendered by coroners in promoting more efficient restriction of the sale of poisons is of so much importance that it is matter for regret to find there is sometimes a deficiency of knowledge on their part as to the scope of the existing law. Such appears to have been the case, according to the report of an inquest held last week in the neighbourhood of Newcastle (see p. 640), when the coroner expressed the opinion that there is need for an Act of Parliament to provide for the sale of carbolic acid being placed under restriction. There is really no want of that kind, for the Pharmacy Act gives ample power to place any article in the poison schedule if it be desirable. The recommendation, in exercise of that power, was made years ago, but up to the present time its ratification by the superior Government department has not been granted.

### PROSECUTION UNDER THE PHARMACY ACT.

In a case heard on Thursday at Liverpool, in which infringement of the Pharmacy Act by the sale of cyanide of potassium was proved, a verdict was given for the plaintiffs, the defendant, F. **Lloyd**, being a dealer in photographic materials. The defence relied upon was that the sale of the article was in accordance with the "custom of the trade.'

### JUNIOR PHARMACY BALL.

We have much pleasure in announcing, at the request of Mr. H. **Arliss Robinson**, the Honorary Secretary of the Junior Chemists' Ball, that the thirteenth of these reunions will take place on Wednesday, the 14th inst., at the Portman Rooms, and that tickets may now be obtained from Mr. **Robinson**, or any of the stewards.

### EVENING MEETING IN LONDON.

The next evening meeting in London of the Pharmaceutical Society will be held on Wednesday, February 14, when the President, Mr. **Michael Carteighe**, is expected to take the chair at eight o'clock. Professor **Attfield**, F.R.S., will read a paper on "An Imperial British Pharmacopœia," and Mr. **Edward Wm. Lucas** will contribute "Laboratory Notes, with Comparative Observations on Some British and United States Pharmacopœial Preparations."

### DOCTOR IN SCIENCE.

Pharmacists generally will be pleased to learn that Mr. **Joseph Reynolds Green**, M.A., of Trinity College, Cambridge, Professor of Botany to the Pharmaceutical Society of Great Britain, has been approved by the General Board of Studies of his University for the degree of Doctor in Science.

# Transactions of the Pharmaceutical Society.

## FIRST EXAMINATION.

A meeting of the Board of Examiners for England and Wales was held on Wednesday, the 31st ultimo.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Arundel, Edmund | Manchester. |
| Attenborough, H. Langley | Leamington. |
| Burland, Walter Vincent | York. |
| Epton, James | Spalding. |
| Lee, Arthur | Torquay. |
| Phillips, John G. | Spalding. |
| Renouf, Fred | Jersey. |
| Tirrell, Arthur William | Hanley. |
| Wade, Walter Colin | Sidcup. |
| Wilkie, James | Kirriemuir. |

The Report of the College of Preceptors on the Examination held on the 9th inst. was received.

*Three hundred and twenty-four* candidates had presented themselves for examination, of whom *one hundred and thirty-nine* had failed.

The following *one hundred and eighty-five* passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students:—

| | |
|---|---|
| Alexander, Thomas Burns | South Shields. |
| Allison, John Robert B. | Retford. |
| Andrews, Percy | Retford. |
| Armstrong, Geo. Barnett N. | Chatteris. |
| Austen, Bertha Georgina | Southampton. |
| Bambridge, Hubert | Wisbech. |
| Barker, Thomas Henry | Birmingham. |
| Barnes, George Harry | Manchester. |
| Batten, Herbert Ernest | Ilminster. |
| Bawcutt, Frank Frederick | London. |
| Beech, Thomas | Knutsford. |
| Bennett, Ernest Henry Geo. | Bristol. |
| Bennie, John Wood | Paisley. |
| Betts, William Maydwell | Towcester. |
| Beynon, John Thomas | Carmarthen. |
| Black, Joseph Edwin | Glasgow. |
| Blakely, Percy Lewis | Bournemouth. |
| Bowman, John Robertson Y. | Leith. |
| Brewis, James Colin | West Hartlepool. |
| Brian, Ernest | Macclesfield. |
| Buchan, William | Kirkcaldy. |
| Cairns, John | Glasgow. |
| Carlton, William Eldred | Gosberton. |
| Carter, Arthur John | Congleton. |
| Chapman, Frederick Thomas | Crowle. |
| Chapman, Joseph Edward | Sunningdale. |
| Clark, Spencer John H. | London. |
| Clement, William Henry | Barnstaple. |
| Cope, Raymond | Leek. |
| Craig, William Reid | Glasgow. |
| Craven, John Swift | Wakefield. |
| Crawford, James | Stirling. |
| Cruikshank, James | Edinburgh. |
| Cruse, Harry Douglas | London. |
| Darke, Thomas Albert Lewis | Totnes. |
| Davidson, Alexander | Leslie. |
| Davies, John | Swansea. |
| Davies, Thomas Herbert | Crugybar. |
| Davies, William George | New Quay. |
| Dawson, John Mark | Middleham. |
| Doughton, Samuel Davies | Aberystwith. |
| Doughty, John Edward | Birmingham. |
| Durie, Peter | Edinburgh. |
| Dyet, Gilbert Cochrane | Larkhall. |
| Earl, Fred Greenwood | Eccles. |
| Ellisson, Mark Dalton | Hoyland. |
| Evans, David W. | Trelech. |
| Ewbank, Henry | Douglas |
| Ferguson, Duncan | Kincraig. |
| Fidler, Samuel James | Southport. |
| Finlay, David Paton | Morningside. |
| Finnemore, Horace | Seighford. |
| Ford, William | Ashton-on-Ribble. |
| Forrest, Thomas B. | Carluke. |
| Foulis, David | Edinburgh. |
| French, Fredk. Alexander | Darlington. |
| Furber, John | Bowes Park. |
| Furniss, Arthur Street | Liverpool. |
| Furnivall, James Frederick | Cardiff. |
| Garbett, Charles | Halifax. |
| Garforth, John Aubrey | Manchester. |
| Garside, Arthur William | Ormskirk. |
| George, William Foxton | Stockton. |
| Giles, Frank | Folkestone. |
| Godding, Thomas | Cambridge. |
| Godolphin, George Teed | London. |
| Goodwin, Ernest Henry | Hammersmith. |
| Greenfield, Harold Harper | Goole. |
| Griffin, William John | Birmingham. |
| Griffiths, Morgan Lloyd | Llangadock. |
| Grimshaw, Percy George | Hull. |
| Guest, George Ernest | South Heindley. |
| Hadden, George | Coulter. |
| Haigh, William | Clayton. |
| Harbottle, Douglas | Whitchurch. |
| Harmer, George Clayton | Eastbourne. |
| Hearder, Henry Noel | Plymouth. |
| Henderson, Wm. J. Campbell | Fraserburgh. |
| Hendry, John | Edinburgh. |
| Hey, Frederick Cooper | York. |
| Hicks, Alexander Frank | Farnham. |
| Hill, John | Hawick. |
| Hodkinson, John | Macclesfield. |
| Hollington, Florence Phœbe | Tottenham. |
| Horsley, Percy James | London. |
| Huddart, Joseph William | Cockermouth. |
| Hyde, James Edwin | Christchurch. |
| Ingham, Herbert | Padiham. |
| Jackson, David | Wednesbury. |
| Jackson, Henry Arnold | Cheadle. |
| Jamieson, George Cowie | Selkirk. |
| Jefferiss, Robert Forbes | Chatham. |
| Jenkin, Charles | St. Austell. |
| Jenkins, Gwilym Reece | Swansea. |
| Jenkinson, James Walter | Forest Gate. |
| John, Ernest | Bristol. |
| John, Owen | Swansea. |
| Johnston, James | Belfast. |
| Jones, Henry Humphreys | Llanrwst. |
| Jones, Walter Eyton | Ruabon. |
| Kerr, George Hodgson | Sunderland. |
| King, Frederick Harold | Ashford. |
| Land, John Hy. Meginley | Derby. |
| Lawrence, Frank | Broad Clyst. |
| Lawrence, Wm. Llewellin | Carlisle. |
| Lewis, Frederic | Shrewsbury. |
| Macadie, William | East Watten. |
| McCutcheon, Alexander | Glasgow. |
| Macdonald, William | Earlston. |
| McFarlane, George | Glasgow. |
| Mackay, Charles | Manningham. |
| McLaren, William | Arbroath. |
| Mangan, George | Rothiemay. |
| Martin, Alexander Clark | Edinburgh. |
| Martin, John | Crieff. |
| Meister, Frederick James | Edinburgh. |
| Melville, John | Fraserburgh. |

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| Middleton, Richard Edgar | Roundhay. |
| Milne, Peter | Insch. |
| Mitchell, John Andrew | Penistone. |
| Mitchell, John Robert | Chester-le-Street. |
| Monks, Edgar Kingsley | Bristol. |
| Moore, Francis Ayrton | London. |
| Moore, Frederick William | Ashbourne. |
| Morgan, Howell | Twickenham. |
| Morris, John | Llansilin. |
| Mossop, Moses | Maryport. |
| Moule, William Amphlett C. | Redditch. |
| Mushet, Robert | Kilmarnock. |
| Nicol, William Geddes | Portsoy. |
| Park, Robert | Glasgow. |
| Paterson, Robert Samuel | Bonnyrigg. |
| Peck, Alfred Newton | Newmarket. |
| Peterkin, James | Lossiemouth. |
| Phillips, William | Bewdley. |
| Pritchard, Frank Chaplin | Westbury-on-Trym. |
| Pugh, John James Edgar | Leominster. |
| Rae, Thomas | Maryhill. |
| Rees, William Edward J. | Pontypridd. |
| Reid, James Alexander | Ellon. |
| Ritchie, David Wilson | Kilmarnock. |
| Roberts, William Evans | Portmadoc. |
| Robertson, Wilfred George | Birmingham. |
| Robson, Vincent Henry | Carlisle. |
| Ross, John | Maryport. |
| Rutherford, John | Edinburgh. |
| Samuel, Henry | Leighton Buzzard. |
| Sanders, John Fletcher | Ilminster. |
| Saunders, John Gilbert | Liverpool. |
| Sawdon, George Wellburn | Whitby. |
| Siminson, Edwin | Warminster. |
| Simpson, Mitton George | Buxton. |
| Skinner, James A. | Leith. |
| Smith, Montague George | London. |
| Smith, Westby | Thorpe Hesley. |
| Staite, William H. Valentine | Ford. |
| Stansfield, Wilfrid | Southport. |
| Steward, Augustus William | Sydenham. |
| Stewart, Francis Gordon | Pathhead. |
| Stuchbury, Frederick | London. |
| Swindale, Jabez | Blackhill. |
| Taylor, Archie | Greenock. |
| Taylor, John Prentice | Glasgow. |
| Taylor, Samuel | Whitby. |
| Tew, Arthur Wilson | Warwick. |
| Thomas, Herbert Charles | London. |
| Thompson, Edgar | Cartmel. |
| Thompson, Raymond Henry | London. |
| Todd, John William | Leicester. |
| Tolmie, William John | Stornoway. |
| Trotter, George Clark | Edinburgh. |
| Turner, Horace | Derby. |
| Urwin, Albert | South Shields. |
| Watkin, Llewellyn William | Borth. |
| Watson, Thomas Montague | Spilsby. |
| Watt, Henry Edgar | West Hartlepool. |
| West, Harry Dawson | Keighley. |
| Westlake, Walter Vincent | Melksham. |
| Williams, Arthur | Hayle. |
| Williams, Edward Albert | Chester. |
| Wilson, Walter Foale | Downham. |
| Womersley, John Gilbert | Bradford. |
| Wray, Robert James | Liverpool. |
| Wright, Robert Rutter | Thirsk. |
| Yeo, John Henry Arthur | Liverpool. |

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The questions set at this examination were published in the *Pharmaceutical Journal* for January 13, p. 574.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

| | Candidates. | | | | Candidates. | | |
|---|---|---|---|---|---|---|---|
| | Examined. | Passed. | Failed. | | Examined. | Passed. | Failed. |
| Aberdeen | 11 | 6 | 5 | Lancaster | 4 | 3 | 1 |
| Aberystwith | 2 | 2 | 0 | Leeds | 11 | 6 | 5 |
| Birmingham | 13 | 10 | 3 | Lincoln | 4 | 2 | 2 |
| Brighton | 3 | 1 | 2 | Liverpool | 13 | 8 | 5 |
| Bristol | 13 | 7 | 6 | London | 43 | 20 | 23 |
| Cambridge | 5 | 4 | 1 | Manchester | 27 | 12 | 15 |
| Canterbury | 6 | 3 | 3 | Newcastle-on-T. | 7 | 5 | 2 |
| Cardiff | 8 | 4 | 4 | Northampton | 1 | 1 | 0 |
| Carlisle | 10 | 5 | 5 | Norwich | 2 | 0 | 2 |
| Carmarthen | 9 | 7 | 2 | Nottingham | 11 | 3 | 8 |
| Carnarvon | 4 | 2 | 2 | Oxford | 1 | 0 | 1 |
| Cheltenham | 3 | 1 | 2 | Penzance | 3 | 2 | 1 |
| Darlington | 5 | 5 | 0 | Peterborough | 5 | 2 | 3 |
| Dundee | 5 | 1 | 4 | Plymouth | 3 | 2 | 1 |
| Edinburgh | 30 | 21 | 9 | Sheffield | 7 | 5 | 2 |
| Exeter | 4 | 3 | 1 | Shrewsbury | 6 | 4 | 2 |
| Glasgow | 20 | 14 | 6 | Southampton | 7 | 3 | 4 |
| Hull | 4 | 2 | 2 | Worcester | 2 | 0 | 2 |
| Inverness | 5 | 4 | 1 | York | 7 | 5 | 2 |

## EVENING MEETING IN EDINBURGH.

*Wednesday, January 24, 1894.*

MR. J. LAIDLAW EWING IN THE CHAIR.

The third evening meeting in Edinburgh of the present session was held in the Society's House, 36, York Place, on Wednesday, January 24, at 8.30.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Messrs. D. Brown, D. B. Dott, Coull, Lunan, and Nesbit.

The following communications were read by the Assistant-Secretary in the absence of the authors:—

### THE TESTS FOR CHLOROFORM.

BY D. B. DOTT, F.I.C., F.R.S.E.

In view of the fact which has recently been authoritatively announced, that a new Pharmacopœia is to be produced before long, it seems an appropriate time to bring forward anything one has to say on the above subject. Although no discoveries of any importance regarding chloroform have been made since the compilation of the last Pharmacopœia, there will be a general consensus of opinion that the characters and tests require some revision.

First, as to specific gravity. From my own experience, and from a series of experiments lately tried in the laboratory, I am clearly of opinion that the specific gravity should be reduced. This opinion is in harmony with the results obtained by Biltz and Schacht.* It is also the opinion of Dr. Squibb, who has given great attention to the matter, and was the first to observe the restraining influence of alcohol on the decomposition of chloroform. Dr. Squibb maintains† that chloroform should not have a higher density than 1·494, and preferably that it should be 1·490. Chloroform which has been reduced to sp. gr. 1·490 will resist decomposition better than chloroform of 1·497 sp. gr. Chloroform of 1·497 may resist decomposition when kept with all known precautions, but experience does not justify the belief that the users of chloroform can be relied on to adopt these precautions. And if a lower specific gravity is desirable in this country, it is even more desirable in tropical regions, and that is an important point to be considered in drawing up an Imperial Pharmacopœia. The specific gravity had best be stated as of 1·490 to 1·495. That allows a reasonable margin of variation, a custom which should be as a rule adopted both in stating percentages and densities. It would be more satisfactory both to manufacturers and analysts.

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* *Pharm. Journ.*, [3], xxiii., 1005.

† *Pharm. Journ.*, [3], xxiv., 92.

Secondly, as to the colour yielded to sulphuric acid. The purpose of this test is a good one, but it must always be used with discrimination, because, as formerly pointed out, the coloration may be due simply to a trace of oil derived from luting, or to resin dissolved out of the cork.

Thirdly, as to a test for carbonyl chloride, etc., in other words, a test to show whether chloroform has undergone appreciable decomposition. Although it has been well known for many years that chloroform is, under certain conditions, liable to decomposition, and that the fact of its having decomposed can be easily ascertained by tests, it so happens that there is no such test in the present Pharmacopœia. It seems to have been pretty well ascertained that the chief products of decomposition are carbonyl chloride, hydrochloric acid, and chlorine, although there is also secondary reaction on the alcohol present, giving rise to ethyl chloride and other compounds. The tests I have employed to detect decomposition in chloroform are moist litmus paper and solution of silver nitrate. I do not think there is the least question that these are the best and most satisfactory tests. I have not found baryta water at all so satisfactory. A trace of carbonic acid will cause a minute precipitate, which it would be very rash to conclude was due to carbonyl chloride, and altogether the test is more open to misconception, and of course does not react with hydrochloric acid or chlorine. There does not appear to be any advantage in introducing a test specially for the purpose of detecting free chlorine. I have not determined the limit of delicacy of the silver nitrate reaction, but the following experiment may be regarded as practically conclusive. One volume of decomposed chloroform was diluted to 100 volumes with pure chloroform, which gave no reaction with silver nitrate. The mixture was then shaken up with nitrate of silver solution, and gave at once a well-marked turbidity. I would therefore suggest that the tests for chloroform might be as follows:—

*Characters and Tests.*—A dense liquid of characteristic odour. Specific gravity 1·490 to 1·495. On allowing ½ fl. drm. to evaporate from a clean surface, no foreign odour is perceptible at any stage of the evaporation. When 1 fl. drm. is agitated with an equal volume of solution of silver nitrate, no precipitate or turbidity is produced after standing for five minutes. On shaking up the chloroform with half its volume of distilled water, the water should not redden litmus paper. When shaken with an equal volume of sulphuric acid, little or no colour should be imparted to the acid.

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The Chairman said, like nearly all the papers by Mr. Dott, this was one that required to be considered carefully before anyone would care to criticise it. In this case, of course, they were dealing with the statements of an expert, and probably very few who were present would feel able to discuss the subject. He would, however, be very glad to hear what anyone had to say.

Mr. Stephenson said they were very much obliged to Mr. Dott for submitting this important paper to their meeting. His statements on such a subject would no doubt be reliable, but, as the Chairman had said, any criticism would be reserved for experts to make.

Mr. Boa said he had observed that in all recent work there was a tendency to simplify the tests for chloroform, and he thought Mr. Dott's suggestions were all in that line. It was important that the tests to be adopted should be such as could be applied by any pharmacist, and ought not to require the exercise of special manipulative skill. He did not think there was any need for elaborate tests in the case of chloroform, and that it was not necessary for ordinary purposes to go beyond those which Mr. Dott proposed, which were similar to those given in the United States Pharmacopœia.

Mr. Gibson said he thought Mr. Dott had made a good point in his suggestion as to specific gravity. It was well known that alcohol retarded the decomposition of chloroform, and the increased quantity required to give the lower density proposed would tend to keep the chloroform better. That alteration alone was a good deal of an improvement, but the other tests were also most useful as a means of securing purity. The specific gravity, however, he regarded as most important.

Mr. Isaac W. Thomson said it was a remarkable fact that in all other pharmacopœias the specific gravity of chloroform was lower than in our own. In the Japanese Pharmacopœia it was 1·485 to 1·490; in the Netherlands Pharmacopœia it was similar; and in the German Pharmacopœia it was 1·485 to 1·489. He had, however, seen a chloroform of higher density than Mr. Dott proposed, which had been kept by a gentleman in Chili for seven years, and at the end of that time it was perfectly good. It was given to a medical man, who used it with perfect success. It would appear, therefore, that a chloroform of higher density would keep well even in a warm country. No one could take any reasonable objection to the density of 1·490 to 1·495. They must keep in mind, however, in sending out such an article as chloroform, that it was as nearly chloroform as possible, and no more preservative should be added than was really necessary. To do otherwise was sending out not chloroform but a mixture of chloroform and alcohol. With regard to the sulphuric acid colour test, he would say that there ought to be no colour after standing twelve hours; some of the pharmacopœias imposed that condition, and it was not too exacting. With regard to the colour being derived from the luting or the cork, that plea was inadmissible, and with proper care there should be no contamination from that quarter. With regard to the foreign odour test, he would suggest that a piece of bibulous paper should be saturated with chloroform, and during or after evaporation there should be no foreign odour and no fixed residue. Mr. Dott did not propose, apparently, to include the zinc iodide and starch test for free chlorine, but it was a very useful and reliable test, and might be added to those proposed. The baryta water test was, no doubt, open to the objection stated, but it was not a test to be lightly set aside.

Mr. D. Brown said, in his letter of apology which was read:—

"I am interested in everything relating to chloroform, and therefore regret not being able to attend your meeting to-night. The tests for the purity of chloroform which I published some time ago (*Pharm. Journ.*, [3], vol. xxiii., 792) represent a good deal of work and careful observation of their behaviour with chloroform in every condition of purity and impurity I could lay hands on. I find extended experience of them only confirms the favourable opinion I had formed of their usefulness.

"I know of no better means for detecting the first signs of decomposition than the zinc iodide and starch test, and I consider that by increasing the quantity used for the foreign odour test, and diminishing the quantity of sulphuric acid to 10 per cent. in the acid test, that a very large quantity of impure chloroform is detected, which, by the usual methods of testing, would pass into consumption. In selecting tests, a standard of purity is required. If it is a low one, rough and ready tests which may be applied by anyone in a few minutes are required only; but if absolute purity—which some say they have reached—is required, the tests cannot be too exacting.

"It is absurd, however, to expect mortals to reach a perfect standard; we should therefore take an intermediate course and fix one within or even a little beyond our present reach, and then select tests which will enable us to say without doubt whether any particular product is or is not up to standard purity.

"The tests I have given enable us to select a product of considerable purity which it is quite within our power to reach. They require time and some experience for their proper application, but accurate results cannot be obtained without the expenditure of both."

Mr. Rutherford Hill said he observed in the German Pharmacopœia, 1890, the specific gravity was given as 1·485 to 1·489, and the zinc iodide and starch test was given. In the Italian Pharmacopœia, 1892, the specific gravity was given as 1·493, and potassium iodide and starch were given as a free chlorine test. In the French Codex, 1884, there were two chloroforms: pure chloroform specific gravity 1·5, and commercial chloroform 1·49. This suggested to him the idea that it might be desirable to have two qualities of chloroform in the Pharmacopœia. They might have a very highly purified chloroform which would stand the most severe tests and be designated pure chloroform. This would be used solely for inhalation and internal medicinal use. They might also have a less highly purified article which would be suitable for external use and for use in the arts and manufactures as a solvent, as a reagent in chemical processes, or as a menstruum in the extraction of the active principles of drugs. This quality would be designated commercial chloroform. He observed that the plan of saturating a piece of paper for the foreign odour test was given in the French Codex, and it was required that there should not only be no foreign odour, but that, at the end of the evaporation, the paper should be perfectly dry. There was one very delicate test for free acid in chloroform which had not been referred to—namely, Valpius' test. One drop of solution of phenolphthalein, one drop of centinormal solution of caustic potash, and 1 C.c. of water are added to 5 C.c. of chloroform, and the mixture shaken and set aside. If no free acid is present the red colour should not disappear in twenty-four hours. It was well known that once the process of decomposition had begun in chloroform it proceeded with great rapidity. It might therefore be desirable that a chloroform which would not stand this test should not be sent out. With regard to the sulphuric acid colour test, the Pharmacopœia seemed to proceed on the assumption that alcohol and sulphuric acid produced some colour, for it stated that the colour should not be greater than would be produced by the presence of 1 per cent. of alcohol. If that were so, he could not understand how Mr. Dott said "little or no colour." His chloroform would contain more alcohol than the present official article, and would therefore, necessarily, always give some colour. He had received a note from Dr. Gordon Sharp, of Leeds, in which he said, "I am interested in the 'Tests for Chloroform,' for at the request of numerous medical friends in Lancashire I made an examination of all the pure chloroforms I could lay my hands on, employing the zinc iodide and starch test as well as the baryta test. I found neither test to answer satisfactorily, so I employed iron iodide solution in the shape of syrup, first making sure it contained no free iodine by testing with starch. I found it much more delicate, too delicate some would say, still, it was practical. Syrup of iodide of iron is handy where the others are not. I can confirm your statement as to a great deal of decomposing chloroform being in the market, for my nostrils have suffered severely from inhaling numerous samples, and the discomfort such cause to patients must be great. One sample, an acetone chloroform, leaves a large residue. I put a frog's heart in a Roy's apparatus and found this residue to powerfully affect it. More than any other make, this darkens sulphuric acid, and all the samples of it are alike in this respect." As to the discussion, there seemed to be a general disposition to agree with Mr. Dott's proposals, and to include also, perhaps, something more. Mr. Brown evidently adhered to his former position. This discussion would be valuable to those who had to compile the next Pharmacopœia, and as to which proposals were the best, that would have to be decided by those competent to judge.

Mr. Isaac W. Thompson, in reply to Mr. Hill, said if the absolute alcohol was what it should be, there would be no coloration with sulphuric acid. He had repeatedly tried the experiment, and found that when pure, absolute alcohol was mixed with sulphuric acid, no colour was developed. With regard to the phenolphthalein test, it was included in the Netherlands Pharmacopœia, and was a very severe one indeed. He rather thought it was too exacting, as the chloroform had to stand twenty-four hours in contact with an alkali.

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The next communication was a

### NOTE ON A PREPARATION OF IRON.

BY D. B. DOTT, F.I.C., F.R.S.E.

My attention was called to a ferrous preparation (of foreign origin) which rejoices in a highly commendatory advertisement, accompanied by no less laudatory testimonials, some of the latter being signed by medical practitioners. It is suggested that the iron exists in a peculiar state of combination, which renders it specially easy of assimilation. The state of combination is understood and believed to be of the nature of an albuminate or peptonate. It was not thought necessary to make an exhaustive analysis, as the following experiments are quite sufficient to show the nature of the preparation.

The solution is light in colour, of a ferruginous, acid, and saline taste. When evaporated to dryness, fumes of hydrochloric acid are evolved, and on igniting there is no perceptible charring, and a residue resembling ferric oxide is left. When this residue is treated with water, and the latter evaporated, a residue remains giving the reactions of sodium chloride. On boiling the preparation there was no coagulation. When heated with two volumes of sulphuric acid, hydrochloric acid was evolved, and there was no charring or darkening in colour. With nitrate of silver an abundant precipitate of silver chloride was obtained.

The total iron was determined by adding ammonia and ammonium sulphide in excess, dissolving the washed precipitate in dilute hydrochloric acid, boiling to drive off sulphuretted hydrogen, peroxidising with potassium chlorate, allowing to cool, nearly neutralising with sodium carbonate, adding then excess of sodium acetate, boiling, and collecting the precipitate of ferric hydrate (the filtrate contained no iron). The precipitate was washed and ignited, and weighed as ferric oxide. The amount indicated was 0·52 gramme Fe in 100 C.c. of the preparation. The chloride was determined by precipitation with silver nitrate in hot solution, to which nitric acid was added. The silver chloride obtained was equal to 2·14 grammes chlorine in 100 C.c.

One C.c. of the preparation was diluted and rendered just alkaline with sodium carbonate, then distilled as in the determination of saline ammonia in water analysis. The ammonia all came over in the first portions of distillate, which were "nesslerised," and the tint imitated with standard solution of ammonium chloride. To do this required 4·8 C.c. of standard solution (1 C.c. = $\frac{1}{100}$ mgrm. $NH_3$).

One C.c. of the preparation was then distilled with excess of alkaline permanganate, in the same manner as used in the determination of albuminoid ammonia, the distillate "nesslerised," etc. There was required of the standard ammonium chloride solution 4·6 C.c., *i.e.*, the result was practically identical with the previous experiment. That is to say, there was no albumin or any analogous compound present, but only a trace of some salt of ammonia, equivalent to ·004 gramme $NH_3$ in 100 C.c.

In fine, this much vaunted preparation is evidently nothing but a weak, rather acid solution of ferrous chloride, with a little common salt. I thought it might be interesting to bring this note forward, as it shows a good example of the kind of preparation which trades on a reputation that is belied by its actual composition.

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The next communication was on—

### THE STANDARD TEMPERATURE FOR SPECIFIC GRAVITY.

BY D. B. DOTT, F.I.C., F.R.S.E.

For the accurate determination of the specific gravity of a liquid, the most suitable temperature is 0° C., chiefly because it is easy to obtain and maintain that temperature correctly by immersing the vessel containing the liquid in melting ice. For practical purposes, however, what is wanted is not extreme accuracy, but sufficient accuracy, with the maximum of convenience. Hence the specific gravity of a liquid is usually referred to the ordinary temperature, which has come to be generally regarded as 60° F. There is, however, no absolutely fixed rule in this respect. The legal standard for determining the measures of capacity is 62° F., and in looking over such a book as Watts' 'Dictionary' one sees all manner of temperatures, from 10° to 20°, in the references to the authorities quoted. There may be a sense in which 60° F. is the normal temperature. If we were in the habit of working out of doors it might perhaps be so regarded, but the average temperature of a laboratory must be decidedly over 60° F. Besides, the question of what constitutes the average temperature of a laboratory is not the chief consideration in the matter under discussion. In the very usual methods of determining specific gravity by means of a bottle with perforated stopper, or by the ordinary form of sprengel-tube, it is of no consequence that the temperature should fall in the course of weighing, but it is decidedly objectionable that the temperature should rise. Not only so, but while it is always easy to slightly warm a liquid, it is difficult and troublesome in summer weather to cool the liquid to 60°. What I wish to submit is that in future determinations of specific gravity, the more convenient course would be to refer the determination to 20° C., instead of to 15°·5 as is customary at present.

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The Chairman said this iron preparation appeared to be one of those evanescent preparations which came into fashion for a time and then fell into obscurity, and were such a plague to the present day pharmacist. It had been remarked to him by a medical practitioner recently that he wondered why the Pharmaceutical Society did not have a laboratory where all these vaunted preparations could be submitted to analysis, and their true composition declared. He had also suggested that it would be useful to have a museum for the exhibition of all these exploded remedies.

Mr. J. I. Fraser said he thought he knew the preparation to which Mr. Dott referred, and was not surprised to hear the result of his analysis. It was, he thought, of Italian origin, and he had always regarded the preparation with suspicion, and thought it was of no value. With regard to the standard temperature for specific gravities, he agreed with Mr. Dott that a higher standard would be an advantage.

Mr. Cowie said there was a distinct advantage in the proposal to raise the standard from 15°·5 C. to 20° C., and he had found that to be so in practice. When one had to lower the temperature of a liquid below that of the surrounding atmosphere, and filled the specific gravity bottle at that lower temperature, the temperature of the liquid immediately began to rise. The result was that during the necessary manipulation the consequent expansion of the liquid caused an overflow through the perforated stopper and down the outside of the bottle, so that an accurate determination could not be made. By raising the temperature as proposed, this objection would be overcome, as it did not matter though the liquid contracted after the bottle had been filled at the standard temperature.

Mr. Boa said the standard temperature suggested seemed a pretty considerable increase. Taking the present temperature as 60° F., it meant an increase of 8° F., and it seemed to him that was possibly a greater increase than would be convenient, at least in Scotland. At the same time, there could be no doubt that it was easier to raise a liquid above atmospheric temperature than to lower it, and in many parts of England and the Continent 20° C. would probably be suitable.

Mr. Isaac W. Thomson said it had to be remembered that raising the temperature as suggested would, in the case especially of light liquids, materially alter all the recognised specific gravities, and make quite a revolution in what was widely known and settled. It would also affect all their present apparatus, which had been carefully adapted to the existing standard. The rise in temperature proposed seemed also greater than was necessary. The average temperature of the British Isles was about 63° F. It might be that in an international pharmacopœia a high temperature would be suitable for many places to which it would apply, but for our own purposes he thought 60° F. was about as convenient as there was any need for.

Mr. Stephenson said he had had some experience of albuminate of iron. He had a prescription for it some time ago, and got a preparation purporting to be albuminate of iron. He turned up a back number of the *Pharmaceutical Journal* at the time, and found a long article, in which the writer came to the conclusion that such a preparation was an absurdity, and there was no such thing as an albuminate. On showing the article to the prescriber, he was convinced that such a view was correct. The point which struck him in the paper on specific gravity was that it was obviously much easier to raise a liquid to a given temperature than to lower it beneath the normal.

Mr. Rutherford Hill said he would have liked Mr. Dott to name the article he criticised, and then they could more effectually apply his crushing condemnation. Replying to Mr. Thomson, he thought there could be no doubt, as Mr. Cowie had shown, that the method which necessitated reducing the temperature below that of the atmosphere was attended by objections not met with in the method requiring a rise of temperature. The average temperature of 63° F. applied to the open air, but Mr. Dott had pointed out that these determinations were usually made indoors. The revolution involved in the proposed new standard was more apparent than real. If the new Pharmacopœia stated that at a temperature of 20° C., chloroform, for instance, should have a certain density, any one could easily apply the test. It would not in any way alter the chloroform itself, and anyone who cared to stick to the old temperature and the old density was free to do so. If a specific gravity bottle was filled at a low temperature, and then handled with a view to weighing, the heat of the hand even would cause expansion sufficient to make the liquid overflow, especially if a light one, and thus it would be impossible to get an accurate determination.

The next communication was on—

## PAPAIN DIGESTION: THE ENTIRE ABSENCE OF PEPTONE, WITH NOTES ON PAPAIN.

BY GORDON SHARP, M.B. EDIN., LEEDS.

*Late Research Student in Pharmacology, Owens College, Victoria University, Manchester.*

In my paper on koumiss, read before this Society in December, 1892, and published in the *Pharmaceutical Journal* of December 24, 1892, I stated that from numerous experiments on papain, pus, urine, and proteids, I was led to believe that, apart from the presence of pepsin or pancreatin, no peptone was ever formed, and what had hitherto been called peptone was really albumose. Further acquaintance with the subject confirms my view on this point. For the present papain engages our attention. On looking up the literature of the subject of papain one finds many distinguished authorities holding peptone to be one of the constituents of the digestion. In the 'Year-Book of Pharmacy' for 1881, page 111, A. Würtz, and in the same work for 1884, page 168, A. Poehl, are quoted as holding this view, and E. G. Clayton, F.I.C., says: "Albumose and peptone are formed during the digestive action of papain." Likewise Professor J. R. Green, in his valuable papers on "Vegetable Ferments," published in the *Pharmaceutical Journal* of June 10, 1893, appears to have fallen in error, and says: "The products of digestion (papain) . . . . are an albumose, peptone, and both leucine and tyrosine" (page 1009). On the other hand, Dr. Sidney Martin ('Year-Book of Pharmacy,' 1886, page 98) says: "No true peptones are formed."

My experiments led me to agree with Martin as to the absence of peptone, and I should not at present have done more on the subject had it not been for the publication of a paper on "Papain" by Frederick Davis, B.Sc., in the *Pharmaceutical Journal* of September 9, 1893, as read before the Pharmaceutical Conference at Nottingham on August 16. In this paper there appears the statement (p. 208): "With a higher percentage of acid (*higher than* 0·050 *per cent.*) the results compare with the last experiment (*in which* 0·050 *per cent. acid is employed*), namely, no conversion into peptones whatever. The presence or absence of peptones was ascertained by the copper test." The italics are mine.

By the copper test I suppose the copper sulphate and caustic potash solution test (the biuret test) is meant. This of itself is a fallacious test, for it gives the pink reaction with both albumoses and peptone. At the end of his paper, Mr. Davis thanks Dr. Martin for suggestions, but surely not suggestions on the determination of the presence of peptone. In five of his experiments Davis allowed the fluids to digest for forty-eight hours, and in one for thirty-eight hours. This leads to false results, for even in the winter time, aftes twenty-four hours, proteid solutions begin to undergo bacterial fermentation under ordinary circumstances, and one cannot determine what is due to the substance under investigation and what is due to accidental bacteria.

To determine the constituents of papain digestion I conducted the following experiments, repeating them again and again till a definite result was obtained. Finkler's papain was employed from two different samples, both giving similar results. Boiled white of egg was used in all the experiments. It was rubbed up in a mortar and made into a fine pulp, mixed with one-tenth its weight of papain and about one hundred times its weight of water. All acid or alkali was avoided, for the reason that the addition of either of these alone at the body temperature is sufficient to convert a small amount of albumin into albumose in a few hours. The mixture of albumin, papain, and water was put into a bottle and kept at the body temperature for eighteen hours, the bottle being shaken at frequent intervals; but the stopper was never removed, so as to prevent as far as possible the entrance of bacteria. At the end of this time there was found to be a considerable sediment, consisting of unaltered albumin, and dysalbumose (insoluble albumose). The mixture was shaken up and a portion thrown on a dialyser, and at the end of an hour the fluid which had passed through was tested by means of saturated solution of phosphotungstic acid, but no precipitate resulted. Another portion gave no pink reaction with one drop of 10 per cent. copper sulphate solution and excess of caustic potash solution (the biuret test). These showed the absence of peptone, for peptone is the only proteid which readily passes through an animal membrane. If the dialysis be continued for eight to twenty-four hours, deutero-albumose passes through and gives both the above reactions; but the point is—it only passes through after many hours, and not at once, as does peptone. For the sake of comparison, pepsin and egg albumin were digested together and dialysed, and the peptone reaction obtained in less than an hour.

The papain digested fluid was next filtered, and its reaction tested and found to be faintly acid (the papain was acid). A portion of the filtrate was next boiled. No coagulation took place, showing the absence of unaltered albumin or globulin. To another portion a trace of caustic potash solution was added, without result, proving the absence of acid-albumin (syntonin). A fresh portion was next saturated with magnesium sulphate, but no precipitate resulted, showing absence of unaltered globulin, but when a trace of acetic acid was added, a faint precipitate fell down, showing the presence of a small amount of globulose. The biuret test was next applied to another portion; this gave a pink reaction, showing the presence of an albumose (peptone having been already proved absent). To a clean test-tube a drop of strong nitric acid was added, and half an ounce of filtered fluid poured on and the tube set aside for some hours, when the merest opalescence appeared, showing the presence of albumoses. When to the same solution sodium chloride was added to saturation, a large precipitate of deutero-albumose fell down, nitric acid only, in the presence of saturated solution of sodium chloride, precipitating deutero-albumose. When a new portion was faintly acidified with acetic acid and saturated with sodium chloride, a distinct precipitate of proto- and hetero-albumose came down. This precipitate was small in amount when compared with the precipitate of deutero-albumose. On water being added to throw the solution out of saturation, the precipitate disappeared. The solution was thrown on a dialyser, and in the course of twenty-four hours the hetero-albumose was reprecipitated, the proto-albumose remaining in solution, thus giving a means of separating the two substances. If the fluid to which acetic acid and sodium chloride to saturation was added be filtered to remove the precipitated proto- and hetero-albumose, and to the filtrate an equal volume of water be added, and then the fluid saturated with ammonium sulphate, the deutero-albumose is thrown out.

To confirm the absence of peptone, a quantity of the original fluid was saturated with ammonium sulphate (which throws down all proteids save peptone), the precipitate of proteids (chiefly deutero-albumose) filtered off, and the filtrate evaporated down, excess of salt removed as far as possible, baryta added to remove the remainder, and finally dilute sulphuric acid to remove baryta, as explained in my paper on koumiss. The application of the biuret and phosphotungstic acid tests gave negative results, indicating absence of peptone.

The tests for proteids by saturation are simple and thoroughly reliable if carefully applied. In some of my experiments I employed the following simple plan, which answers, broadly speaking, for the detection of all the proteids. To any solution add excess of magnesium sulphate; a precipitate indicates unaltered globulin. If no precipitate with magnesium sulphate alone, add a drop of acetic acid; a precipitate indicates globulose. Filter off the globulose and to the filtrate add an equal volume of water and sodium chloride to saturation, along with one drop of acetic acid; a precipitate indicates proto- and hetero-albumose. (For the separation of proto- and hetero-albumose, see above). Filter off the proto- and hetero-albumose, add an equal volume of water, and saturate with ammonium sulphate, by which deutero-albumose is thrown out. Filter off, and the filtrate contains peptone (if any), which can be tested for in the usual way.

To summarise: Simple papain digestion gives:—

1. Globulose
2. Proto-albumose } traces.
3. Hetero-albumose
4. Deutero-albumose, abundant.
5. Dysalbumose and undigested matters.

Peptone, entirely absent.

Commercial papain itself I have repeatedly examined, and found some samples slightly acid (I speak of Finkler's). This appears to have escaped the notice of most observers. The acidity is probably due to decomposition. At all events, it does not affect the activity of the ferment. I found no specimen entirely soluble either in water or in weak alkaline fluid. The insoluble portion, on being well washed with water, dried, and treated with strong nitric acid, dissolved, forming a yellow solution (xantho-proteic reaction), and another portion, to which strong nitric acid and pernitrate of mercury (Millon's reagent) were added, gave a red coloration. These two tests pointed to a proteid. Another portion was added to 10 per cent. sodium chloride solution and formed entirely insoluble, and still another portion, digested at a moderate temperature with active solution of pepsin, in one hour showed no change. The insoluble part, then, undoubtedly pointed to dysalbumose in greater part if not in whole. The true nature of papain is unknown, but the commercial substance, when examined, gives reactions for the various albumoses, chiefly deutero-albumose, and with the latter the true ferment may be united. Different samples differ as to the relative proportion of the various albumoses. Nothing of the nature of peptone is present. Leucine and tyrosine may be found, but do not concern us at the present time. When papain is added to coagulated albumin it decomposes it as already detailed, the decomposition products appearing in infinitely larger amounts than is consistent with their existence in the quantity of papain employed, hence the assurance that they are the result of the work of the ferment, and are not merely found because they were added in the papain.

The plant *Carica Papaya* is believed to contain carpaine, $C_{14}H_{27}NO_3$, but none appears to be present in Finkler's papain, for I repeatedly made acid solutions, removed colouring matter by chloroform, treated with ammonia, and extracted with chloroform, and applied the double salt tests with negative results, comparison experiments being made with a very dilute strychnine solution.

My brother, Mr. Alexander Sharp, chemist and druggist, working under my directions, confirmed my results as to the absence of peptone and other points, and to him my thanks are due.

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Mr. Gibson said Dr. Sharp had evidently gone very elaborately into the question of papain digestion, and he was a little astonished to find that he had got such a variety of substances in the product. He had conducted a series of experiments with papain a good many years ago, when it first came out. He tried it by itself, and along with sodium carbonate. The white of egg used was passed through a No. 40 sieve, and the mixture of papain and albumin kept at the body temperature for four hours. At the end of that time there did not appear to be any albumin dissolved, and he came to the conclusion that papain was a failure. He thought Dr. Sharp's experience seemed to confirm this view, and showed that papain did not contain a peptonising ferment. As an aid to digestion, there could be nothing better than pepsin, and papain could not for a moment be compared to it.

Mr. Duncan said this paper was one that could not be criticised off-hand, but would need to be carefully studied after it appeared in the Journal. He did not think papain should be subjected to too much condemnation, for it had long been known as an undoubted fact that the leaves of *Carica Papaya* had been used for softening meat. It was also well-known that papain was successfully used in removing diphtheritic membranes. He could not vouch for the strict accuracy of the following incident, but he gave it as he got it. Some time ago he was informed by a student that on his father's estate some cattle had broken through a fence and strayed down to the edge of the water, where a number of papaw trees were growing. They had apparently browsed upon the papaw leaves, and in the morning all of them were found dead. It was at first suspected that they had been poisoned by coolies, but on opening the stomachs the leaves of *Carica Papaya* were found therein, and at the points where the leaves were in contact with the coats of the stomach, these were dissolved and the stomach itself perforated. He observed that Dr. Sharp added neither acid nor alkali in his experiments, and he thought that was a mistake, and a series of experiments in alkaline and acid media should also have been tried. He could not understand how Dr. Sharp got peptone when using pepsin in a neutral solution, as it did not act except in presence of an acid. Papain, on the other hand, was like trypsin, and acted in an alkaline medium.

Mr. James Clark, Aberdeen, in a letter which was read, said he thought Dr. Gordon Sharp's method seemed very careful and complete. He had not tried separation of the albumoses by magnesium sulphate and acetic acid, having only had experience of precipitating all of them with ammonium sulphate before testing for peptone. This process he had found not so simple as it looked, because, as shown by Kühne, after adding excess of ammonium sulphate and filtering, a further precipitate came down if more ammonium sulphate was added after standing. The process was tedious and, he thought, a trifle uncertain. The work he (Mr. Clark) had done had been a little rough, and though he could not say that no peptone was formed, he could readily believe it. His results were far from promising, and so opposed to the statements as to the power of papain that he concluded either that he did not know how to test it, or it was not worth testing. The results arrived at by Davis (*Pharm. Journ.*, [3], xxiv., 207) did not say much for it, and were more in accordance with the crude results he obtained than with the glowing statements of the advertisers. It was decidedly tiresome to find in a recently published book on 'Digestion' that the author was so enamoured of papain that he borrowed bodily the advertising matter, and gave no hint that the expressions were not original. Again, in all the experiments conducted, the length of time the process of digestion had to be carried on was positively absurd. Davis found forty-eight hours necessary, and this was moderate compared with a series of experiments to determine the relative value of papain and pepsin which appeared, he thought, in an American journal some years ago. If papain was to be of any use as an aid to digestion, it must complete its work in six hours at most, and any test applied to it should certainly not exceed that time.

Mr. Rutherford Hill, replying, said Dr. Gordon Sharp found that the albumin was dissolved. The process of hydration, however, did not go beyond the formation of deutero-albumose, and therefore just stopped short of peptonisation, which was the next stage in ordinary peptic digestion. Undoubtedly, papaw juice had the property of softening meat, but that was due to the formation of albumoses and not peptones. Mr. Duncan's statement as to the cattle was an interesting and important one, as it seemed to indicate that papain had the power of digesting living tissue, and that the death of the cattle was due to its digestive action, causing perforation of the stomach. It had been asserted by Finkler (Christy's 'New Commercial Plants and Drugs,' No 8) that papain dissolved living tissue. That was denied, on experimental data, by Davis, in his paper; and in the discussion Gerrard also stated that he did not expect papain would digest living tissue. Of course it was known that papain, when injected into the blood, caused a rapid change, and in large quantity produced death by paralysis of the heart. It might be that the ingestion of a quantity of fresh juice would be followed by rapid absorption, and the death of the cattle might be due to this poisonous action on the heart, and not to the perforation of the stomach, which may have taken place afterwards. The suddenness of the death gave probability to the latter view. He thought Mr. Duncan had indicated a defect in the paper in the entire absence of any experiments in acid or alkaline media. The research would certainly have been more complete had these been included, and there was still a field for investigation in that direction. Mr. Gibson was surprised that so many substances had been found. He could only say that the paper gave the results of a series of experiments very carefully conducted and repeatedly confirmed, and they could only be effectively criticised by a similar series, which would be very useful, and might, by enlarging their scope, throw a good deal more light on a subject which was perhaps not yet fully cleared up. It had been shown that, at least in a neutral solution, papain does not act as a peptonising ferment, and no peptone is formed.

The Chairman, in moving a vote of thanks to the authors, said he was sure they hoped that Mr. Dott would soon be all right again, and that he would be spared to read many more such papers at these meetings. He would like to hold up Mr. Dott as an example to all, not only for the regularity of his attendance, but for his readiness and diligence in contributing papers. With regard to Dr. Gordon Sharp, this was the second paper he had given them, and they were much indebted to him for sending such papers to their meetings, and for the time and work which he had spent on this important question. He would just remark that he did not think papain had secured the confidence of the medical profession.

The vote of thanks was awarded with acclamation.

The Assistant-Secretary having described some recent additions to the Museum, and drawn attention to some valuable books recently added to the Library, the meeting then closed.

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

On Thursday, January 25, a meeting was held at 103, Great Russell Street, the President, Mr. E. F. Harrison, in the chair, to discuss a suggested code of pharmaceutical ethics. The discussion was opened by the reading of the following paper:—

### A SUGGESTED ETHICAL CODE FOR PHARMACISTS.

BY E. H. GANE.

Most of you will remember that in the early part of this session a discussion took place before this Association on the subject, "How can we check unjust trade?" Several more or less impracticable resolutions were put forward by the promoter, none of which, however, met with much approval, the upshot being that an amendment was carried urging the Council of the Pharmaceutical Society to formulate a code of ethics. That proposition is now under consideration by the Council, and it may seem at first sight somewhat out of place for us to hold further discussion on this matter while it is still, so to speak, *sub judice*. But this Association has in certain quarters been accused of indulging in an academic discussion and passing an academic resolution on this subject; and it is to remove this stigma, if such it be, and with no intention of hindering, but rather of helping the Council in its deliberations, that I have ventured to put before you this evening a few practical ideas on this subject; and I am the more constrained to do so, as the President of the Society said, when referring to the above resolution, that if this principle were worked out spontaneously, it would be much better than for the Council to formulate any plan. But as far as I can see at present, this is almost impossible without the help of the Council, and I do not doubt that sooner or later we shall gladly be given that help.

To begin with, the question probably will be asked, what need have we of a code of ethics, and what good will it do? To that question I cannot do better than quote, in answer, the opening words of an address delivered by Mr. Ernest Hart at the Pan-American Medical Congress last year. He says: "Sir Astley Cooper, one of the greatest surgeons and most accomplished gentlemen of the last generation, was in the habit of addressing candidates for membership of the Royal College of Surgeons, of which he was president, somewhat in the following words: Gentlemen, you are about to enter on a noble and difficult profession; your success in it depends on three things: first, on a good and thorough knowledge of your profession; secondly, on an industrious discharge of its duties; and thirdly, on the preservation of your moral character. Without the first—knowledge—no one would wish you to succeed; without the second—industry—you cannot succeed; and without the third, even if you do succeed, your success can bring you no happiness."

These words might equally well form an admirable text for the guidance of the conduct of all pharmacists. About the first two points I shall say nothing, they have been already dealt with before you; it is to the third that I wish specially to refer, and it is evident that by the words "moral character," here, is not so much meant the private life character as what the catechism terms our duty towards our neighbour. The pharmacist, in his purely business dealings, has a responsible duty to perform, but in the professional part of his craft he has a doubly responsible duty, first, to the public, secondly, to the medical profession, and in this latter duty it is of the utmost importance, if he is to maintain his dignity and position, that he should observe a high moral tone of conduct. It is solely to what I may term the professional part of his calling that this ethical code is intended to apply, the trade part will then find its proper level. In addition to the above mentioned duties, the pharmacist has another, and one which at present he sorely neglects, and that is his duty to his brother craftsmen and to the Society formed for his protection and advancement. This brings me to the first clause in the code which I have the honour to present to you. I have divided it into two parts, which I have termed the "voluntary" and "compulsory" codes, because at present we have not the power of enforcing the laws therein laid down.

*Voluntary Code.*

Clause 1.—All pharmacists shall be Members or Associates of the Pharmaceutical Society.

This is a duty which I should have thought all would have recognised, even if they did not see their way clear to carry it out; consequently I was considerably astonished to see, a short time ago, in the editorial columns of the *Chemist and Druggist*, a statement to the effect that pharmacists were under no such obligation. Such a statement, and coming, too, from a journal which professes high moral principles, can only be characterised as a disgrace to its staff. You have been told so frequently, and more ably than I can do it, what are your duties to the Society, that words from me would be superfluous. It is incumbent on us for two reasons: first, because by its aid we hold the position we have to-day; secondly, because only by its aid can we hope for further improvement, and unless we stand by and help no such improvement is possible. It is a democratic institution, and the election of its representatives is in our own hands.

It has been suggested to me that this clause might with advantage be made into a compulsory licensing clause, with an annual fee for renewal. This would mean the same in the end, and have the advantage of being compulsory. That is a point I leave for your discussion.

Clauses 2 and 3 can be taken together, dealing with the question of apprentices and assistants.

Clause 2.—No pharmacist shall take an apprentice unless the said apprentice shall have passed the Preliminary examination or its equivalent, and all pharmacists shall exercise due care that their apprentices are fit and proper persons to take up the calling. If the apprentice has not passed the Preliminary examination, the term of apprenticeship shall date from the time of his passing such examination.

Clause 3.—No pharmacist shall engage any assistant above the age of twenty-three years, unless he be duly qualified, or can show good cause why he is not.

By the general adoption of the principles of these two clauses, not merely pharmacists in general, but the public as well, would largely benefit, and the benefit to the latter is of as much importance as the former. In the first place, we should get a better class of men into the trade, which of itself would tend to raise the general status, and put an end to the miserable petty jealousies so prevalent at present; and secondly, we should be doing a kindness to many men who otherwise would to a large extent have their future prospects in life severely handicapped, if not altogether ruined. The desirability of the first of these two clauses is admitted on all hands, and further discussion can be omitted at present. The second clause is framed not so much for the individual benefit of pharmacists as for that of the assistants themselves. If a man is not able to pass his qualifying examinations in two years, the chances are he never will, and it would be better for pharmacists, and kinder to the assistant, to show him early his unfitness for the calling, and that while still young he may readily turn to one more fitted to his abilities.

The next clause forms a key to the solution of the whole question raised by the previous discussion on the checking of unjust trade.

Clause 4.—No pharmacist shall engage himself or lend his name to any person or persons not duly qualified, or to any company formed for the purpose of evading the requirements of the Pharmacy Act, and no pharmacist shall engage as an assistant anyone who has been guilty of such conduct.

As this point will be raised later, in connection with the compulsory section, its discussion can be deferred till then.

Clauses 5 and 6 deal more particularly with our relations to the medical profession, and also, to some extent, the general public.

Clause 5.—All pharmacists shall do their utmost to discourage the sale of "secret" remedies, and no pharmacist shall openly advertise any such preparation.

Clause 6.—No pharmacist shall give a copy of any prescription to anyone other than the patient for whom the medicine has been prescribed, and in no case without the sanction of the prescriber, unless the original be lost or destroyed.

These are burning questions just now, both amongst ourselves and also the medical profession; and they are, too, questions which touch very closely our professional honour. With reference to the first of the two clauses, most of us would, I think, like to see the whole trade in such remedies swept away. That, however, seems, just at present at any rate, to be out of the question. The reply would be a *non possumus*. We can, however, do a great deal to discourage this trade, and emphatically it is our duty to do so, as far as lies in our power. It is essentially an ethical question—are we justified in indiscriminately distributing preparations of the composition of which we are, for the most part, in profound ignorance; which also, as none know better than ourselves, are usually absolutely worthless, oftentimes doing more harm than good. I cannot, in this connection, refrain from again quoting from Mr. Hart's address:—"But," he says, "it is sometimes suggested that the usefulness of the 'secret' drug may be so great as to overpower and outweigh morality, and call for its prescription. Is there any foundation for such an assumption in the whole history of medicine? In the whole history of the past can we recall any example of a secret medicine which had aught but the most insignificant value, or could not easily be replaced? We may take even the most famous, such as the notorious remedy of Mrs. Stephen for dissolving stone in the bladder, for the divulging of which eminent men petitioned Parliament for a grant of £5000. It was granted, and what do we read of the remedy when divulged? That it consisted of calcined eggshells, or of lime obtained by a filthy and obscene process. Naturally, and like all secret remedies when divulged, it ceased to cure. . . . In our day there is no such thing as a secret remedy, in the true or in any other than the trade meaning of the word. They are secret only to the gullible public to whom they are sold. . . . Let us visit those physicians who dabble in them with the severity of the code. I do not think that is asking more than is due to the honour of the professional body and the welfare of the public.

"In respect, then, of secret medicines, at least, the world has up to this date lost nothing by the stern and scornful disapproval with which the medical profession regards those tricky nostrums, and by the punishment with which they visit, and always ought to visit, those who sell the honour of their calling and the free communication of medical knowledge, which is the birthright of mankind, for some mess of commercial pottage."

That, gentlemen, is a sufficient answer to the question raised. Let us do all in our power not merely to discountenance those secret remedies prepared by others, but especially to guard against indulging in that branch of quackery ourselves.

The second of these two clauses concerns the medical profession equally with ourselves. Looked at from a purely business standpoint, it should commend itself to everyone. The frequent indiscriminate distribution of the prescription of a physician to friends of the patient, is unjust to ourselves, inasmuch as we are giving away part of our stock in trade, and too often receiving no return; but it is especially unjust to the physician, because we deprive him of the just return for the skill which he has spent both time and money to acquire. A due observance of this clause would do much to bring about closer relations between pharmacist and physician, and to the mutual advantage of both. If we take the first step, the medical profession will not be backward in responding. "*Ne sutor ultra crepidam*" is a proverb that the pharmacist would do well to bear in mind, also in those portions of his business which closely touch the medical.

Clause 7.—All pharmacists shall do their utmost to obey and see obeyed the spirit and letter of the law relating to the sale of poisons. No pharmacists shall sell any scheduled poisons by wholesale to any but a qualified retailer or another wholesaler.

This subject has been so recently dealt with, and so ably, by the President of the Pharmaceutical Society, that I refrain from further comment. The latter part I have introduced more especially to deter chemists in country towns from supplying to small shops in outlying districts poisonous articles ready packed for sale, a practice which is much on the increase, and violates the whole spirit of the Pharmacy Act. It is equally applicable to wholesale dealers also.

That, gentlemen, is the first part of the "voluntary" code. It is one, I hope, which will commend itself to pharmacists generally, and if so, then I hope it will be observed, and if necessary enforced. I have not thought it necessary at present to submit any method for enforcing it. Better by far for it to be adopted spontaneously. If that is done, then we can consider means of making the few who may object observe it.

### *Compulsory Code.*

I pass now to the second portion, the "compulsory code," which is presented to you in the form of a resolution, to be forwarded, if carried, to the Pharmaceutical Society's Council. I have adopted this method because at present we have no power to enforce its provisions, and we cannot do so unless we obtain the requisite legal power, and that can only be done through the Society. I shall move the following resolution:—"That this meeting of the Chemists' Assistants' Association requests the Council of the Pharmaceutical Society to present, as soon as possible, to Parliament, a Bill containing provisions for powers for regulating the professional conduct of pharmacists, together with power to erase from the Register of chemists the name of any person or persons guilty in the opinion of the Council of disgraceful conduct, the said conduct to include the following acts and offences.

1. Wilful adulteration of drugs or medicinal preparations.
2. Conviction for criminal offences.
3. Wilful tampering with the prescriptions of physicians.
4. Wilful non-observance of the laws relating to the sale of poisons.
5. Covering unqualified persons, or lending their name or services to any company formed for the purpose of evading the requirements of the Pharmacy Act."

At the outset, I would particularly ask you not to form the absurd idea that it is intended for every act disapproved of in these clauses to have attached to it the extreme penalty of the offender's name being erased from the Register. The Council or censors appointed by it should determine from the gravity of the offence in each case whether the offender's name shall be erased, or whether a minor punishment, such as a fine or temporary suspension, should be inflicted.

Comment on the first four clauses of this resolution seems almost superfluous. We are entrusted with responsible duties, and if we are to enjoy the confidence of the public and the medical profession, it is essential that our conduct should be above reproach. It cannot be, and is not, desirable that we should allow in our ranks men who are guilty of such practices as are here set forth, and we can only keep our calling pure and raise our social status by refusing to allow such men to remain in practice. Our duty to the public demands it. A word or two must be said with reference to the last clause. This clause affords a solution of the whole question of unjust trading, and by unjust trading I refer specially to such as is exemplified in the management of certain, but not all, large companies. The pharmacist has his living to make by his calling, a poor one at best, and that living is threatened in many cases by the methods pursued by certain persons. Many of these companies tack on to their ordinary business that of a pharmacist purely for purposes of advertisement, and retail articles at a price with which the ordinary pharmacist is entirely powerless to cope; a loss in this particular department is often the case, but that is set off by other departments, or in some cases by other businesses. That is what I mean by unjust trading, and as such we must put a stop to it. Sad to say, it originates within our ranks, and it is from within it must be met. Such businesses cannot exist without the qualified manager, and if we refuse ourselves to take part in any such transactions, and also refuse to allow others to do the same, we cut the ground away from beneath the feet of these unjust traders. Are we to allow the few to threaten our living, and to prostitute their honour and the honour of our calling for purely selfish motives? Is that fulfilling our duty to our brethren? Such conduct would not for a moment be tolerated in any other profession or trade, and why in ours? Let us visit such men with condign punishment. The punishment is sharp, but is suited to the offence, and we should have no scruples in urging its enforcement. Only in this way can we prevent a large part of our business from falling away from us.

That, then, is the ethical code I have the honour of submitting to your consideration. It does not deal with everything; many other things have cropped up in the course of its consideration which I did not see my way clear to deal with. I have, however, dealt with the most important. Crude and inadequate in many respects I feel it to be, but I look to you to discuss it thoroughly and amend it where possible. Discuss and improve it, but remember that, if you approve of it, your duty does not stop there; it remains for you to endeavour to carry it out. The assistant of to-day is the employer of to-morrow, and this subject will affect us much more than the employer of to-day. Will you endeavour to carry out these principles in your business life, and will you, when employers, act up to it and teach your assistants to do likewise? Success can only be attained by the individual efforts of each of us. The Chemists' Assistants' Association has the honour of being the first to revive this subject. May the chemist's assistant be the first to carry it out.

# Provincial Transactions.

## LIVERPOOL CHEMISTS' ASSOCIATION.

The annual meeting was held at the Royal Institution on Thursday, January 25, Mr. J. J. Smith, President, in the chair.

The Secretary (Mr. J. Smith) read the annual report of the Council, and the treasurer presented his statement, which showed a very satisfactory condition of the finances of the Association. The report showed an addition of fifteen to the list of members, and withdrawal of five, leaving the numerical strength 116.

Messrs. Bain, Buck, Conroy, Cowley, Davies, Wardleworth, and Wokes were elected members of the Council.

The Secretary mentioned a case which recently occurred in his presence of an intended purchase of carbolic acid. The chemist ascertained upon inquiry that it was recommended by a neighbour, and was to be given on sugar to a woman over eighty years of age, who suffered from a cough. A misadventure was, in all probability, frustrated by the careful action of the chemist. Friars balsam was the article really required.

### PRESIDENT'S ADDRESS.

The position of honour which you have conferred on me gave me surprise and trepidation on the occasion of my election, and those effects have not yet disappeared. I can only interpret your action as signifying a wish that small or average men, as well as great ones, should occupy the position of president of this Association.

We call ourselves the "Liverpool Chemists' Association." Am I presumptuous in asking the question, are we correctly designated? How many of us deserve the name of chemist with its present day wide application? A few amongst us of whom we are proud may lay claim to it, but the majority of us require an adjective qualifying the noun "chemist." To my mind the qualification of "chemist" conferred on the successful Minor candidate is a larger title than the qualifying title conferred on the Major man.

Pharmacist is the name which correctly describes all of us engaged in pharmacy, whether we be Minor, Major, or Modified men, or founders. And I cannot but believe that so long as the term pharmaceutical chemist or pharmacist is legally restricted to Major men only, whilst belonging, by its plain meaning, to the whole body of qualified men practising pharmacy, so long will an anomaly exist which it would be wise for the Pharmaceutical Society to remedy. The distinction is, to my mind, absurd and unjust, and I should like to see the Council of the Pharmaceutical Society taking steps to amend the Pharmacy Act in this direction.

This brings me back to the question I asked. In calling ourselves the Liverpool Chemists' Association, whilst as a body we are not strictly chemists, or are but pharmaceutical chemists or pharmacists, are we (to put it in modern phraseology) up-to-date? Manchester, Brighton, Bolton, Cambridge, and the Midlands use a more correct designation than we do. I grant you that there was a time when the Association had the greatest claim to the title, but times have changed, science has advanced, and other Associations have been formed in which chemical science alone absorbs the attention of the members, and pharmacists are now left to carry on the work of what, I believe, is the oldest provincial association of the kind.

A retrospective address, with 1893 as its subject, would not, I think, prove very interesting. Hash is not a favourite dish, I expect, with any of us. The existing laws as affecting pharmacy have been discussed locally and through the medium of our journals, and anything I could say would prove stale. As regards future legislation, we consider that it should strike any unbiassed mind as an anomaly that seven unregistered men may do what it is illegal for one man to do; thus admitting that qualified ownership and direction are unnecessary. Carry the principle into the region of other illegal acts, and you will be surprised where it lands you. Although I mention this unjust anomaly, I wish I felt sanguine of a speedy remedy being found. I confess I do not. But I will say that we can feel little respect for those of our body who sell their services to a grocer, a draper, or a company whose policy is inimical to our own brethren.

The question of placing carbolic acid in the poison schedule still remains undecided by the Privy Council. One department of Government urges it, as also do coroners generally, and also the Pharmaceutical Society, but the opponents to it are many, and some of their arguments have a show of reason. But they totally ignore the important fact that there is no middle course open. It must either continue to be sold by anyone in any sort of receptacle, and without the necessity of a label, or it must be regarded as a poison and sold with the consequent restrictions. The importance of this subject may be gathered from the returns for 1891 of the number of cases of poisoning by carbolic acid. That year showed a large increase upon previous years, the number rising to ninety-four, of which sixty-three were suicides.

Whilst I would not undervalue legislation as a means of bettering our position, it is in another direction I look for a more real and permanent improvement. A few weeks back I came across a statement by a brother pharmacist in one of our journals that the town in which he was engaged in business numbered about 100,000, and yet every medical man in it did his own dispensing. It struck me as singular that in a town of that size no medical man has had the courage to relinquish that part of his work (the least congenial, I should think) to those specially trained for it. We cannot over-estimate the importance of this subject to us as pharmacists. The cry comes frequently from country, town, and city, "We have been educated, trained, and examined, but we get little or no dispensing to do," and we think there is ground for disappointment. Would it not be well for us to relinquish the Micawber-like attitude of expecting something favourable to turn up in the way of legislation, and in lieu of it do our best to influence both the medical profession and the public in favour of dispensing by pharmacists. Legislation is not likely to help us here, any more than it is likely to help the medical profession by preventing us from counter-prescribing in cases of minor ailments. It may be as well if I mention some of the obstacles which lie in the way of medical men generally relinquishing dispensing. And at the outset we must, of course, admit that such a change is quite impracticable in country districts. When we consider small towns we find here objections which do not obtain in large cities like our own. I have by me a letter from a successful and highly respected practitioner in such a town, in reply to one I wrote him on the subject. He writes as follows:—"Where a practitioner works by himself, and desires to shift dispensing on account of its being too heavy, then the chemist can dispense for him cheaper than if the practitioner kept a dispenser. In small towns I fear jealousy would be at work, as practitioners would employ different chemists, and thus different interests would be brought into existence. Some patients would object, having a mistaken notion that their complaints would be known and talked about. Club and parish patients object to the trouble of first coming to the doctor and then going to the chemist's." He continues: "In large towns it ought to work well, and I unhesitatingly say it is the right thing everywhere, and would lessen your call for prescribing, but it will be some while before it is taken up in small towns, and even then should be done by the profession *en masse*, thus preventing comparison."

I can endorse all my friend says of present objections, having lived in such a town myself. But, like him, I cannot regard them as insuperable. Time will work a change, even here, as the public get convinced that such a reformation would involve greater safety to them. An appreciation, too, on the part of the pharmacist, of his true calling, which is certainly not that of an all-round prescriber, will also help to bring him his legitimate work. I consider the prescribing chemist, who is found in most towns and rarely keeps within lawful bounds, to be a great stumbling-block in the way of effecting right relations between the medical and pharmaceutical callings, and they best serve our body who endeavour to be helpmeets to the medical profession and not competitors.

In Liverpool, I believe medical dispensing is not so largely indulged in as in London, where almost every practitioner sends the medicine to the people for whom it is destined. On the part of the medical man a formidable obstacle arises in the expectation of pecuniary loss, and as it is evident that competition in this profession is quite as severe as in our more commercial calling, this is not to be lightly treated. The anticipated loss to a busy practitioner would have compensating gains, and is more imaginary than real. He would have more time to devote to his more legitimate work, and to obtain the leisure so necessary to an overworked professional man. He would be relieved of an anxiety and responsibility which we all know something of. The large percentage of bad debts, too, from which medical men proverbially suffer, would not then include medicine supplied, and that would be a direct gain. If it is urged that the change would involve greater expense to the patients and prevent them calling in their medical adviser as often as they otherwise would (which I question), then the pharmacist should endeavour by one plan or another to overcome this objection, for it is certain that he can supply medicine to the public equally as reasonably as a medical man.

An article appeared lately in the *Liverpool Daily Post* bearing on the question, whether it is well for a patient to know the composition of medicines which are given to him, and it was gratifying to me to note that the whole article assumed the preparation of the medicine by the pharmacist. It closes as follows:—

"From these conclusions we may infer that there are two sides to the question whether it would be better for all prescribers to make up their own medicine. It is a practice no longer largely indulged in in our city, and when it was general it led to the supply of an inordinate quantity of medicine. This custom has at least the good effect of preventing the druggist or middleman from learning the secrets that may be more advantageously known only to the doctor himself, and it enables the honest physician, if he is merely prescribing a make-believe, to avoid charging as much per bottle for it as he would for a mixture of more or less expensive drugs. It used to be said that the druggist made 11d. profit on every shilling he took over his counter. Nowadays, thanks to the advance in chemical science and manufacture, he does not realise anything like the same proportion, but as the custom stands he is able to charge an all-round sum of a shilling or eighteenpence, as the case may be, whether the cost of it be fairly great, or only the price of the bottle and the label."

That reference to our custom of charging a uniform price for bottles of similar size or doses is, to my mind, deserving of our serious consideration, if we wish to get dispensing into our own hands. Especially does the incongruity in prices show itself in the case of concentrated mixtures or drops, and I do not think we should be wise (although loyal to our price list) in charging the same for a 3 or 4-oz. bottle of drops, irrespective of the value of its contents. In the one case we might be getting a fee almost equal to that expected by the prescriber, and he would be justified in objecting. Prescriptions nowadays are not, as a rule, so complex nor mysterious to the public as they used to be. I do not, of course, mean to assert that the knowledge and skill which the pharmacist has been obliged to acquire, in order to become a specialist in risky and dangerous work, should not be adequately remunerated. But I do say that, where expense forms an obstacle to the dispensing by pharmacists, it is better for him to relinquish his boast of getting full prices for dispensing, if it involves dispensing about as many prescriptions as there are days in the week.

Another feature in our business, which doubtless is objectionable to our medical brethren, is the practice prevailing amongst some of us of putting up a variety of stamped remedies for various complaints. I may be singular, but I have never put up more than two articles requiring stamps. The indiscreet advocacy of stamped medicines, savouring somewhat of quackery, I regard as distinctly prejudicial to us as pharmacists.

It is common enough to hear pessimistic views expressed by our brother chips. I cannot altogether share these views. Pharmacy has a future grander in privilege and social position than it has had in the past, and we can each do our part in improving the position of our calling by making ourselves more necessary to the medical man and the public. The words of a French physician, recently quoted in the *Pharmaceutical Journal* (*ante*, p. 265), shall close my address:—

"For my part, I respect and honour the profession of pharmacy as much as that of medicine so long as both are practised with a proper sense of duty . . . . . The pharmacist who does properly understand his work has the right to be proud of his profession. It might also be said that his position is more meritorious than that of the medical man, for it is more unpretending, and less is known about his work. The practitioner who contends with disease at the bedside of the patient, and follows its progress step by step, is yet conscious of a grim satisfaction in the struggle, and enjoys his triumph when successful. The pharmacist, his fellow worker, who places in his hands the weapons of his choice, is a stranger to these pleasures, however. It is not on the part of the public, but in his own conscience that he finds the cheering testimony that he has done his duty."

Mr. T. F. Abraham, in proposing a vote of thanks to the President for his very thoughtful and sensible address, thought that, while maintaining charges at remunerative figures, it was not always advisable to base the charge upon the number of doses, and suggested that that point should be considered in the next issue of the Liverpool price list.

At the close of the meeting, the President invited the members to join him in a cup of coffee, over which they lingered for some time in sociable conversation.

## Parliamentary and Law Proceedings.

### POISONING BY OXALIC ACID.

On January 24, Mr. E. M. Grace, the coroner for the Lower Division of Gloucestershire, held an inquest at the Plough Inn, Euston Road, Bristol, on the body of Frederick Sheppard, aged 39 years, a shoemaker, of 34, Owen Street, St. George, who had committed suicide by swallowing a quantity of oxalic acid.

The medical evidence showed that death was due to oxalic acid poisoning, and after deliberating in private, the jury returned a verdict of "felo-de-se."—*Bristol Mercury*.

### POISONING BY SALT OF LEMONS.

At Islington, on January 24, Coroner Thomas held an inquest concerning the death of Sarah Brown, aged 17 years, a laundrymaid, who had poisoned herself with salt of lemons.

Alexander Keith, chemist and druggist, of 742, Holloway Road, deposed that the deceased entered his shop on Monday, the 22nd inst., and asked whether salt of lemons was good for taking stains out of linen. He replied in the affirmative, and she purchased three-pennyworth of the salt (binoxalate of potassium).

The jury returned a verdict of "Suicide whilst of unsound mind."—*Morning Leader.*

### POISONING BY CARBOLIC ACID.

On Wednesday, January 24, Mr. Theodore Hoyle, city coroner, held an inquest at the Blue Bell Inn, Byker, concerning the death of Mary Black, who succumbed on Tuesday night after swallowing carbolic acid.

After the evidence had been given, the coroner commented upon the frequency of this sort of poisoning, and said the sale of the article wanted regulating, like other poisons. It was quite time that an Act was passed placing upon the means of securing it the greatest possible restriction.

The jury concurred with these remarks, and a verdict was returned to the effect that deceased poisoned herself whilst in a desponding state of mind.—*Newcastle Daily Leader.*

### POISONING BY CYANIDE OF POTASSIUM.

An inquest was held at the Victoria Law Courts, Birmingham, on January 26, before the city coroner (Dr. O. Pemberton), on the body of Henry William Gill (35), of Wastwater, Yardley Road, Acock's Green.

William Wilson, manager to the Messrs. Ash, Gill, and Co., manufacturers, of Betchworth Works, Stratford Road, who found deceased sitting in a chair at his office, dead, with a jug, a tumbler, and a bottle of whiskey by his side, said he presumed that deceased, wishing to mix some whiskey and water, had procured some of the latter liquid in a jug which contained cyanide of potassium—a poison used in the business.

Thomas Ash said the cyanide of potassium was kept in the warehouse, and was accessible to anyone. He had never countenanced the use of the jug for procuring water for drinking purposes. The deposit at the bottom was undoubtedly cyanide of potassium. Deceased was very careless in his method of dealing with poisons, and witness had often advised him to take more care.

By the coroner: Deceased was perfectly familiar with the deadly character of the poison mentioned.

Dr. Charles Chadwick deposed to making a post-mortem examination of the body and finding traces of prussic acid in the stomach, which would result from taking cyanide of potassium, and death was due to this.

In summing up, the coroner pointed out that there could be no doubt that deceased lost his life through taking this poison, which was in hundreds of workshops in Birmingham. It was to be hoped, however, that in other places it was in better custody than appeared to have been the case in the present instance. It seemed to him an extraordinary thing that such a substance should not be kept under lock and key, and distributed by a person who was fully aware of its nature. There was no evidence to show that deceased had any particular trouble, and this taking away the probability though not impossibility of suicide, the jury would doubtless conclude that death resulted from misadventure.

The jury concurred, and the verdict was entered accordingly.—*Birmingham Argus.*

### ADMINISTERING ARSENIC TO HORSES.

At Spalding Police Court, on January 30, Ernest Webster, a farm servant, of Pinchbeck, was summoned by Mr. Thomas Atkinson, a well-known farmer of the district, for administering poisonous drugs to horses; and Henry Atkin Gibson, chemist, of Spalding, was charged with selling the drugs, in violation of the provisions of the Pharmacy Act. It was shown in evidence that the farm servant purchased a pound of arsenic at Mr. Gibson's shop, alleging that it was for bird stuffing, but he gave it to his master's horses, and three of them, valued at £165, died from the effects. A fellow-servant had recommended the arsenic, stating that it would do the horses good. The charge against the chemist was that he had sold the poison to an unknown person, not properly introduced. For the defence, it was sought to show that Webster was a customer, but the magistrates convicted in each case, and imposed on each defendant a fine of £5 and costs.—*Yorkshire Daily Post.*

## Notices of Meetings next Week.

MONDAY, FEBRUARY 5.

*London Institution*, at 5 p.m.
"Art about us," by Lewis F. Day.
*Royal Institution*, at 5 p.m.
General Monthly Meeting.
*Society of Chemical Industry*, at 8 p.m.
"Note on an Interesting Explosion caused by Sodium Peroxide," by Dr. A. Dupré.
"Theory of Dyeing. Part I., Ingrain Colours," by P. W. Dreaper.
*Society of Arts*, at 8 p.m.
"The Detection and Measurement of Inflammable Gas and Vapour in Air" (third lecture), by Professor Frank Clowes.

TUESDAY, FEBRUARY 6.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (fourth lecture), by Professor C. Stewart.

WEDNESDAY, FEBRUARY 7.

*Sheffield Pharmaceutical and Chemical Society*, at 8 p.m.
"A Question of Pharmaceutical Politics," by C. O. Morrison.

THURSDAY, FEBRUARY 8.

*School of Pharmacy Students' Association*, at 7 p.m.
"Iodine and its Compounds," by C. J. Taylor.
"The Relation of the Chemist to the Medical Practitioner," by E. J. Kitson.
*Chemists' Assistants' Association*, at 8.30 p.m.
"Solution," by H. T. Durrant.
*London Institution*, at 6 p.m.
"The Life History of a Mountain Range," by J. J. Harris Teall.
*Royal Institution*, at 3 p.m.
"Mountain Exploration," by W. M. Conway.
*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Parasitic Plants," by Miss E. M. Wood.
*Midland Pharmaceutical Association*, at 8.30 p.m.
Smoking Concert at the Colonnade Hotel.

FRIDAY, FEBRUARY 9.

*Royal Institution*, at 9 p.m.
"Fortuitous Variation in Animals," by Professor W. F. R. Weldon.
*Sheffield Microscopical Society*, at 8 p.m.
Practical Night. Demonstration by W. Barraclough.

SATURDAY, FEBRUARY 10.

*Royal Institution*, at 3 p.m.
"Light," by Lord Rayleigh.
*Pharmaceutical Football Club v.* Wood Green, at Shepherd's Bush, at 3 p.m.

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⁂ In consequence of pressure upon our space, we are compelled to defer the publication of several communications.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Addison, Austen, Cleave, Hardie, Kendall, Miller, Warren.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, FEBRUARY 10, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the meeting last Wednesday, the first business transacted was that of ascertaining the fourteen members of Council who are to retire from office next May, either by lot or in rotation, with the result that Messrs. Allen, Bottle, Carteighe, Greenish, Hampson, Southall, and Young remain in office another year.

The additions to the roll of the Society comprise five pharmaceutical chemist members, four chemist and druggist members, forty-two associates, and fifty-one students.

It was announced as a special feature of the Finance Committee's report, that Consols of the value of £100 had been purchased on account of the Benevolent Fund, and that a donation of £100 has been received from Mr. S. M. Burroughs. Two donations to the Orphan Fund have been received during the month—one of £50 from Mr. Isaiah Bourdas, and one of £2 10s. from Mr. Pickard.

On the recommendation of the Benevolent Fund Committee, one grant of twelve pounds, three of ten pounds each, and one of five pounds were ordered to be paid. The scheme for the guidance of the Committee, in regard to reduction of annuities under certain conditions, was submitted by the Secretary and approved. In moving the adoption of the report, the Vice-President expressed satisfaction that the Orphan Fund is now beginning to receive support, and he suggested that contributions to this Fund would be more numerous in proportion as the members are more generally made acquainted with its existence and objects. For that purpose he hoped local secretaries would take advantage of the opportunity afforded by the collection of annual subscriptions, and press upon members the claims of the Orphan Fund, as well as those of the Benevolent Fund.

The report of the Library, etc., Committee gave a statement of the attendances at the Library and Museum, as well as the circulation of books, and recommended that the donors of books and specimens for the Museum should be thanked for the contributions already reported. It was decided that, in accordance with the recommendation of Professor Greenish, two of Brin's gas cylinders should be purchased for the purpose of lantern illustration of lectures or papers at the evening meetings, etc.

The usual report of the results of examinations was presented, and the report of the General Purposes Committee gave a statement of the progress made with cases for alleged infringement of the Pharmacy Act which have been placed in the hands of the Society's solicitor. From this it appears that several defendants have paid penalties, while in some instances judgment has been obtained, and other cases are still standing over for trial. Reports of several fresh cases of infringement of the Act had been submitted, and on the recommendation of the Committee proceedings were ordered.

Two communications from the Privy Council were reported. One had reference to the use of specially shaped bottles for poisons, and to the irregular sale of poisons by dealers in photographic materials who are not registered under the Pharmacy Act. On the recommendation of the Committee it was decided that the Privy Council should be informed of the opinion held by the Council that specially shaped bottles would not effect the object desired in regard to poisons, and that in the case of any unregistered persons being reported to the Registrar, as dealing in poisons within the meaning of the Act, proceedings were and would be taken to enforce the penalty incurred. The other communication from the Privy Council had reference to the sale in oil shops of vermin killers containing strychnine. It was the result of a representation which has been made by a coroner to the Privy Council at the request of a jury, and it was decided that the Privy Council should be informed that proceedings would be instituted against any unregistered persons reported to be selling such vermin killers.

In referring to these communications, the President pointed out that very frequently the riders appended to the verdicts of coroners' juries were given without a full understanding of the actual state of the law or of the action taken by the Council in its administration. In regard to the sale of photographic chemicals, such as cyanide of potassium, etc., a case was tried last week in Liverpool, and penalties had been recovered in other cases which had not been reported.

## POISONING BY MISADVENTURE.

In further reference to the subject of accidental poisoning, the *British Medical Journal* of last week remarks, with approval, that the points chiefly insisted upon in metropolitan and provincial newspapers as being essential for protection against

Vol. LIII. (Third Series, Vol. XXIV.), No. 1233.

danger from poison are extension of the poison schedule and the compulsory use of distinctive bottles for poisonous preparations. The case of carbolic acid and the frequent occurrence of fatal accidents with that substance are mentioned as illustrating the necessity for extending the poison schedule. In regard to the use of distinctive bottles there is reason for doubting whether there is any need for making it compulsory, since the practice is now so generally adopted by pharmacists. It is also pointed out that the direction in which there is the greatest need for stringent application of the Pharmacy Act is to the sale of preparations containing poison, which form the secret remedies improperly named patent medicines. The opinion is expressed that the restriction of the sale of poison to the hands of competent persons is the first requisite for securing public safety, since they alone can be depended upon to observe the precautions which are necessary. In this connection the *Echo* has very properly remarked that "though we cannot, for the sake of would-be suicides, stop the sale of poison, it is advisable to surround it with rigid precautions."

### EVENING MEETING IN LONDON.

The evening meeting to be held at 17, Bloomsbury Square, on Wednesday next, February 14, should have a special attraction for all connected with pharmacy, the subjects to be considered being of the greatest importance, since they have a direct bearing on every-day pharmaceutical work. Professor Attfield, on account of his position as the appointed editor of the projected work, is able to speak with authority concerning the forthcoming "Imperial" Pharmacopœia for the British Empire; and Mr. Lucas—who has had an extended practical experience at home and abroad, and is now in charge of the laboratory at the historic house of John Bell and Co.—may be expected to furnish many useful suggestions in his laboratory notes and comparative observations on certain preparations official in the British and United States Pharmacopœias. It is to be hoped, therefore, that the supporters of the Society, particularly those residing in or near London, may not lay themselves open to a charge of indifference to some of their best interests by abstaining without good cause from attendance at this meeting. The President, Mr. Michael Carteighe, is expected to take the chair at eight o'clock precisely.

### UNIVERSITY DISTINCTION.

A few months ago (see *Pharm. Journ.*, June 17, 1893) we recorded the fact that Mr. R. Harding Bremridge, B.A. Oxon., B.Sc. Lond., son of Mr. Richard Bremridge, Secretary of the Pharmaceutical Society, had attained the unique distinction of being a "Double-First" in chemistry and physiology at the examinations held by the University of Oxford. We are now pleased to note that he has been elected to a senior demyship at Magdalen College, tenable for four years. Mr. R. Harding Bremridge has been connected with this college since 1888, when he was elected from the Merchant Taylors' School to an open exhibition in natural science, and during the following year he was elected to a demyship in the same subject.

### CATALOGUE OF THE LIBRARY.

A new edition of the Catalogue of the Library of the Pharmaceutical Society is published this week, and contains nearly eighty pages more than its immediate predecessor, thus showing to what an extent the collections of books in London and Edinburgh have increased. The method of arrangement remains as formerly, and the Hanbury library is with advantage included in the general alphabetical list, the books being especially indicated, however, by a capital ℌ.

### TEACHING UNIVERSITY FOR LONDON.

The summary of the recommendations of the Gresham Commission on a teaching university for London is published in the *Times* of Tuesday last. According to this it is proposed that the Senate should consist of the Chancellor and sixty-five other members appointed by the Crown and certain departments of State, together with various colleges and institutions in London. A list is also given of the teaching institutions which it is proposed should be admitted as schools of the university, and it is suggested that two kinds of students should be recognised—internal and external. The former will pursue regular courses of study of not less than three academic years' duration in recognised schools, but external students will be exempt from such attendance, though three years must elapse between their first examination by the university and their final examination for the first degree. The final examinations for the two classes of students will, if not the same, represent the same standard of knowledge. The degree of doctor will, except in medicine, be conferred only on those who have by study or research contributed to the advancement of learning or science, and power will be reserved to confer honorary degrees in certain specified instances.

### PHARMACEUTICAL FOOTBALL CLUB.

The annual dinner of this Club will be held at the Holborn Restaurant on Thursday, February 22, at 6.45 p.m. Professor Attfield, President of the Club, has promised to take the chair, and tickets may be obtained of Mr. E. H. Gane, Honorary Secretary, 17, Bloomsbury Square, W.C.

### AS OTHERS SEE US.

The January number of the organ of the *Société de pharmacie du Sud-Ouest* is devoted almost entirely to the report of an address by H. Marcailhou d'Aymeric, president of that society, dealing with pharmaceutical education and examination in the United Kingdom. The Preliminary examinations in both Great Britain and Ireland are described as being much weaker tests of knowledge than that for which the French certificates of study are granted to aspirants for qualification as *pharmaciens* of the second class. It is urged, as a defect of the French system, however, that candidates are permitted to substitute an acquaintance with some modern language in place of Latin. The Minor and Major examinations and their Irish equivalent are said to be far from being equal in value to the corresponding French examinations; and it is noted, as matter for regret, that there is no such degree as that of "doctor" that can be bestowed upon advanced British pharmacists, giving them additional prestige.

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, February 7th,* 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Greenish, Grose, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Newsholme, Richardson, Schacht, Southall, Storrar, and Young.

The minutes of last meeting were read and confirmed.

### The Lot for the Next Council.

The lot having been taken in the usual manner to determine the seven members of the Council who should retire in May next, the following names were drawn:—

Abraham. Atkins. Cross.
Hills. Leigh. Martin.
Newsholme.

The following, who remained in by lot last year, now retire by rotation:—

Grose. Harrison. Johnston.
Martindale. Richardson. Schacht.
Storrar.

The following seven remain in office another year:—

Allen. Bottle. Carteighe.
Greenish. Hampson. Southall.
Young.

### Diplomas.

The undermentioned, being duly registered as a Pharmaceutical Chemist, was granted a diploma stamped with the seal of the Society:—

McClumpha, Robert.

### The late Professor Bentley.

The President read a letter he had received from Mrs. Bentley, thanking the Council for the resolution passed last month, and for the kind manner in which Professor Bentley's services to the Society had been acknowledged.

### Elections.

### MEMBERS.

### *Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Irwin, Hubert Aloysius | London. |
| McClumpha, Robert | Newcastle-on-Tyne. |
| Sage, Charles Edward | London. |
| Savage, George Bernard | Brighton, |
| Smith, Alfred Jason | Gloucester. |

### *Chemists and Druggists.*

The following, who were in business before August, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Andrew, George | Rainham. |
| Grant, John | Methlick. |
| Vincent, Oliver | Truro. |
| Wheeldon, James | Manchester. |

### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Adam, Alexander Anderson | Alyth. |
| Dunn, Isaac George | Bridport. |
| Eyles, John Robert | Weymouth. |
| Hardie, Alexander | Old Deer. |
| Harrington, John Frederic | London. |
| Hick, Alfred William | Stockport. |
| Johnson, William | Leeds. |
| Joint, Francis Salter | Exeter. |
| Jones, Tom Young | London. |
| Keeble, James Purcell Edmed. | Clevedon. |
| Laing, Alexander | Glasgow. |
| McNab, Walter Girdwood | Gorebridge. |
| Mallett, Henry Philip | Norwich. |
| Mitchell, Walter Richard | London. |
| Pyle, Robert | London. |
| Rae, William Murdoch | Glasgow. |
| Robison, Ebenezer | Stockport. |
| Rose, Alfred | London. |
| Row, George Commins | Braintree. |
| Thornton, Charles Hopkinson. | Exmouth. |
| Wilkerson, Wallis | Rushden. |

### ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Students) their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Cruickshank, William | Aberdeen. |
| Dixon, Rowland | Sheffield. |
| Dyson, Herbert | Derby. |
| Ferry, Robert Bailey | Hartlepool. |
| Gilderdale, Frederick | Wakefield. |
| Green, George | Bristol. |
| Herald, Walter Ogilvie | Godley. |
| Holt, Robert Dickinson | Bowdon. |
| Hope, Richard | West Houghton. |
| Jones, John Monk | Aspull. |
| King, James | Kilmalcolm. |
| Medley, Fred | Barnsley. |
| Moore, Francis Henry | London. |
| Roberts, Arthur Harry | Barrow-in-Furness. |
| Short, William John | Portsmouth. |
| Simpson, Stewart Richard | Llandilo. |
| Stones, Arthur John | Rotherham. |
| Tarry, William Ambrose | Derby. |
| Wheeler, Harry William | London. |
| Whittle, James | Bedlington. |
| Williams, Harry Griffith | Sheffield. |

### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Amies, Samuel Myddleton | Ludlow. |
| Armstrong, George B. N. | Chatteris. |
| Arrowsmith, George Micklem | London. |
| Ball, John Arthur Barrett | Exeter. |
| Bennett, Ernest Henry George. | Bristol. |
| Bland, William Rowland | Blackpool. |
| Breese, John Soley | Llanidloes. |
| Brewis, James Colin | West Hartlepool. |
| Brian, Ernest | Macclesfield. |
| Burnitt, Ernest William | Goole. |
| Compton, Richard William | Leicester. |
| Cresswell, John | Barnsbury. |
| Daniels, Frederic William | Leicester. |
| Davidson, George G. | Dundee. |
| Dawson, John Mark | Middleham. |
| Essam, James Francis | Sheffield. |
| Frost, Wilfred Elliot | Derby. |
| Garsed, William | Elland. |
| Green, Samuel Marston | London. |
| Harris, John | Torquay. |
| Hughes, David | Bath. |
| Hunt, Henry Lionel | Bath. |
| Jackson, David | Wednesbury. |
| Jackson, Henry Arnold | Cheadle. |
| Jennings, Henry G. H. | Bulwell. |
| Jones, William Parry | London. |
| Judge, Joe | Wakefield |

# REGISTRAR'S REPORT.

## MEMBERS, ASSOCIATES, AND STUDENTS OF THE SOCIETY FOR THE YEAR 1893.

| | Life Compounders. | | | Annual Subscribers. | | | | |
|---|---|---|---|---|---|---|---|---|
| | Members. | | Associates in Business. | Members. | | Associates in Business. | Associates not in Business. | Students. |
| | Pharm. Chemists. | Chem. & Druggists. | | Pharm. Chemists. | Chem. & Druggists. | | | |
| Number in 1892 ... ... | 222 | 6 | 14 | 1421 | 603 | 1443 | ... | ... |
| " restored, 1893 ... | ... | ... | ... | 12 | 1 | 19 | ... | ... |
| " elected, 1893 ... | 16 | ... | 9 | 62 | 37 | 182 | ... | ... |
| | 238 | 6 | 23 | 1495 | 641 | 1644 | ... | ... |
| Deaths, Secessions, etc. ... | 6 | ... | ... | 89† | 35 | 100† | ... | ... |
| **Total Strength of the Society** | **232** | **6** | **23** | **1406** | **606** | **1544** | **995** | **811** |
| **Summary:—** | | | | | | | | |
| 1892 ... ... | 222 | 6 | 14 | 1421 | 603 | 1443 | 1019 | 797 |
| 1893 ... ... | 232 | 6 | 23 | 1406 | 606 | 1544 | 995 | 811 |
| Increase ... ... | 10 | ... | 9 | ... | 3 | 101 | ... | 14 |
| Decrease ... ... | ... | ... | ... | 15 | ... | .. | 24 | ... |

## COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1889-93.

### MEMBERS.—PHARMACEUTICAL CHEMISTS.

| | 1889 | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|---|
| Restored to Membership ... | 5 | 11 | 14 | 21 | 12 |
| Elected " ... | 73 | 67 | 76* | 72 | 62 |
| (Total additions) ... | 78 | 78 | 90 | 93 | 74 |
| Deaths, Secessions, etc. ... | 92 | 80 | 84 | 135† | 89† |
| Increase ... | ... | ... | 6 | ... | ... |
| Decrease ... | 14 | 2 | ... | 42 | 15 |
| **Total Number of Annual Members ... ... ...** | **1459** | **1457** | **1463*** | **1421** | **1406** |

### MEMBERS.—CHEMISTS AND DRUGGISTS.

| | 1889 | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|---|
| Restored to Membership ... | ... | 3 | 4 | 4 | 1 |
| Elected " ... | 9 | 13 | 9 | 62 | 37 |
| (Total additions) ... | 9 | 16 | 13 | 66 | 38 |
| Deaths, Secessions, etc. ... | 42 | 42 | 27 | 31† | 35 |
| Increase ... | ... | ... | ... | 35 | 3 |
| Decrease ... | 33 | 26 | 14 | ... | ... |
| **Total Number of Annual Members ... ... ...** | **608** | **582** | **568** | **603** | **606** |

### ASSOCIATES IN BUSINESS.

| | 1889 | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|---|
| Restored ... ... ... | 3 | 7 | 12 | 36 | 19 |
| Elected ... ... ... | 94 | 123 | 146 | 175 | 182 |
| (Total additions) ... | 97 | 130 | 158 | 211 | 201 |
| Deaths, Secessions, etc. ... | 152 | 90 | 84 | 108† | 100† |
| Increase ... | ... | 40 | 74 | 103 | 101 |
| Decrease ... | 55 | ... | ... | ... | ... |
| **Total Number of Annual Associates in Business ...** | **1226** | **1266** | **1340** | **1443** | **1544** |

### ASSOCIATES NOT IN BUSINESS.

| | 1889 | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|---|
| Increase ... | ... | ... | 161 | ... | ... |
| Decrease ... | 21 | 51 | ... | 11 | 24 |
| **Total Number of Associates not in Business ... ...** | **920** | **869** | **1030** | **1019** | **995** |

### STUDENTS.

| | 1889 | 1890 | 1891 | 1892 | 1893 |
|---|---|---|---|---|---|
| Increase ... | ... | ... | 52 | ... | 14 |
| Decrease ... | 115 | 23 | ... | 140 | ... |
| **Total Number of Students ...** | **908** | **885** | **937** | **797** | **811** |

### LIFE COMPOUNDERS.

| | 1889. | 1890. | 1891. | 1892. | 1893. |
|---|---|---|---|---|---|
| **Members :—Pharmaceutical Chemists** ... ... | **206** | **195** | **186** | **222** | **232** |
| Increase ... ... ... | ... | ... | ... | 36 | 10 |
| Decrease ... ... ... | 3 | 11 | 9 | ... | ... |
| **Members :—Chemists and Druggists** ... ... | **2** | **2** | **2** | **6** | **6** |
| Increase ... ... ... | ... | ... | ... | 4 | ... |
| **Associates in Business** ... ... ... ... | ... | ... | ... | **14** | **23** |
| Increase ... ... ... | ... | ... | ... | 14 | 9 |

* *One* of these paid as an Associate in Business, but afterwards passed the Major examination, and was elected a Member.

† Some of these paid the Life composition fee.

# ANALYSIS OF EXAMINATIONS FOR THE YEAR 1893.

## FIRST EXAMINATION.

| Number of Candidates during the Year. | Number of successful Candidates during the Year. | Number of Rejections during the Year. | Number of Examinations during the Year. | Average number of Candidates at each Examination. | Average number of Rejections at each Examination. | Percentage of Rejections. |
|---|---|---|---|---|---|---|
| 1489 | 739 | 750 | 4 | 372·25 | 187·50 | 50·37 |

Number of Certificates received in lieu of the First Examination ... 97

## MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

### ENGLAND AND WALES.

| Examinations. | Number of Candidates during the Year. | Number of Successful Candidates during the Year. | Number of Rejections during the Year. | Number of Examinations during the Year. | Average Number of Candidates at each Meeting. | Average Number of rejections at each Meeting. | Percentage of Rejections. |
|---|---|---|---|---|---|---|---|
| Major ......... | 140 | 62 | 78 | 4 | 35·00 | 19·50 | 55·71 |
| Minor ......... | 817 | 285 | 532 | 4 | 204·25 | 133·00 | 65·11 |
| Modified ...... | *Eight Candidates presented themselves—Two passed—Six failed.* | | | | | | |

### SCOTLAND.

| Examinations. | Number of Candidates during the Year. | Number of successful Candidates during the Year. | Number of Rejections during the Year. | Number of Examinations during the Year. | Average Number of Candidates at each Meeting. | Average Number of rejections at each Meeting. | Percentage of Rejections. |
|---|---|---|---|---|---|---|---|
| Major............ | 12 | 7 | 5 | 4 | 3·00 | 1·25 | 41·66 |
| Minor......... ... | 372 | 184 | 188 | 4 | 93·00 | 47·00 | 50·54 |
| Modified ...... | *One Candidate presented himself and passed.* | | | | | | |

# THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1893.

Additions during the year:—

| | | |
|---|---|---|
| Number of persons who have passed the— | | |
| Modified Examination .......................... | | 3 |
| Minor " .......................... | | 469 |
| Major " ...................... | 69* | |
| Number of persons restored to the Register on payment of a fine .......................... | | 22 |
| Number of persons registered on payment of the registration fee, having been in business before August 1, 1868 ............ | | 3 |
| | | 497 |

Erasures during the year:—

| | |
|---|---|
| Deaths ................................................ | 216 |
| Erased at the request of registered persons themselves ........................................ | 3 |
| Increase of numbers on Register ................. | 278 |
| | 497 |

---

* These having already been included in the number who passed the Minor, do not increase the numbers on the Register.

| | | |
|---|---|---|
| Number of Pharmaceutical Chemists on the Register, December 31st, 1893 | 2,236 | |
| " Chemists and Druggists ... .. ... ... ... ... | 12,562 | |
| | | 14,798 |

| | |
|---|---|
| Killick, Herbert James | London. |
| Manners, Samuel | Montrose. |
| Miller, Arthur | Bassenthwaite. |
| Mirrilees, Arthur Houldsworth | Lasswade. |
| Mitchell, Willie | Halifax. |
| Moore, Francis Ayrton | London. |
| Morgan, Alfred Houlston | Rhayader. |
| Parsons, Arthur H. L. | Merthyr. |
| Payne, Herbert | Kensington. |
| Payne, Roger | Saffron Walden. |
| Prior, James Siddall | Manchester. |
| Roberts, William Evans | Portmadoc. |
| Robertson, Wilfred George | Birmingham. |
| Sequeira, Septimus Willie | London. |
| Smith, Charles Henry | London. |
| Smith, Montagu George | London. |
| Swindale, Jabez | Blackhill. |
| Thompson, Raymond Henry | London. |
| Turner, William | Birmingham. |
| Walker, Alfred Ernest | Coventry. |
| Ward, George Stafford | Gloucester. |
| White, Henry Fox | Clifton. |
| Wolstenholme, Austin Whiley | York. |
| Wright, Robert Edwin | Redditch. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

### REPORT OF THE FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended sundry accounts for payment, also the purchase of £100 Consols on the Benevolent Fund account. The financial statement of the North British Branch was examined and passed.

The **PRESIDENT** (as Chairman of the Committee) moved the adoption of the report and recommendations. There was nothing calling for special notice, either in regard to the receipts or expenditure. With regard to the Benevolent Fund, the payments had been heavy, as usual in January, so that there was only enough left in hand to meet the outgoings for the present month. There had been one donation to the Fund from Mr. S. M. Burroughs, who last year presented it with £100 in American railway stock. This year he sent a cheque for £100 as a thank-offering for the prosperity of the past year, feeling, as he said, every confidence that the Fund was administered in a way to do much good. He only stipulated, for reasons of which the Committee were already aware, that it should not be invested in ground rents. Of course, that stipulation would be attended to, and it was very gratifying to find that some of those who were prosperous were not forgetful of the poorer members of the craft. There was also a donation of £50 from Mr. Isaiah Bourdas to the Orphan Fund, and one from Mr. Pickard, a divisional secretary, of £2 10s. to the same fund. These donations were very gratifying to the Council.

The motion was unanimously agreed to.

### REGISTRAR'S REPORT.

The Registrar's report on the numerical strength of the Society was laid on the table. It is printed at pages 644–5.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to a registered chemist and druggist (aged 66), who was also a subscriber to the Fund for six years. Applicant, who had a grant of £10 in January, 1893, is suffering from progressive paralysis. (Cheltenham).

£5 to a registered chemist and druggist (aged 50) suffering from defective sight and deafness. Has had one previous grant. (Greenwich).

£10 to a pharmaceutical chemist, life member (aged 54), and former local secretary, now in a lunatic asylum. There is a wife and three children. (Lewes).

£10 to the widow (aged 60) of a member and subscriber. Applicant suffers from rheumatism, and is dependent on her daughter. She had a similar grant a year ago. (Sandwich).

£12 to a member and subscriber (aged 78) who, having been in business for thirty-six years, was compelled to give it up in 1893, and has now no means of support. (Liverpool).

Two other applications were not entertained.

The **SECRETARY** submitted a scheme for the guidance of the Committee when considering the reduction of annuities, which was approved.

The **VICE-PRESIDENT** (as Chairman of the Committee) moved the adoption of the report and recommendations. He had no special remark to make with reference to the grants, beyond calling attention to the fact that money was constantly being given away, and therefore it was necessary that the Fund should be as constantly replenished. As this was the time of year when people were paying their subscriptions, it was only fitting that he should appeal to those members who had not yet subscribed to the Fund to do so. He was glad to see that the Orphan Fund had received some support during the past month, and he hoped members would continue to support it in addition to the general Benevolent Fund. He had before him a statement showing how much had been received by the Orphan Fund during 1893, and could not help thinking that had the members generally been better aware of the existence of this Fund, that amount would have been much greater. It had been thought by some that the Orphan Fund would interfere with the general Benevolent Fund, but he did not think such an idea would bear examination. The condition of receiving relief from this Fund was previous connection with the Society and subscription to the older Fund, and therefore it seemed to him that this new departure was in its inception, and would be in its working, a useful appendage to the general Benevolent Fund, and not a weight upon it. It had been suggested that they should not press the claims of this Fund, but rather wait for legacies and large donations to flow in, but that was not his view. He was a strong believer in what was called living charity, the charity which gave during lifetime, and did not wait until death occurred, and the donors had no further use for what they left behind. He hoped that the local secretaries when they collected the subscriptions to the Society would press the claims of the Benevolent Fund as earnestly as ever, and also speak a good word for the Orphan Fund. Such a fund commended itself to every one, more especially to chemists, who, as he had said before, under the present conditions of business could not as a rule make much provision for their families. With regard to the scheme for the reduction of the annuities, the Committee had now agreed on the lines on which it would act; it did not take the form of a strict rule, but would form the basis on which the action of the Committee would depend. The subscribers would probably be pleased to know that there were certain fixed principles by which the Committee was guided in dealing with the Fund, and he might add that this regulation was framed on the same lines on which other large benevolent societies acted.

The resolution was unanimously agreed to.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

*Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average |
|---|---|---|---|---|---|
| December . | Day . . | 467 | 31 | 3 | 19 |
| | Evening . | 151 | 15 | 6 | 10 |
| Year 1893 | Day . . | 5134 | 34 | 1 | 17 |
| | Evening . | 1773 | 25 | 2 | 9 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| December . . | 168 | 92 | 76 | £1 0*s.* 5*d.* |
| Year 1893 . . . | 2313 | 1301 | 1012 | £12 19s. 3½d. |

Donations to the Library had been announced (*Pharm. Journ.*, January 13, p. 572), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

*Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| December . | Day . . | 448 | 46 | 5 | 24 |
| | Evening | 36 | 6 | 1 | 2 |

Donations to the Museum had been announced (*Pharm. Journ.*, January 13, p. 572), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee, on the recommendation of Professor Greenish, had decided to purchase two Brin's gas cylinders for use at evening meetings and lectures.

The PRESIDENT, in moving the adoption of the report and recommendations, said there was nothing beyond the usual routine work referred to. Two of Brin's gas cylinders had been purchased for use at evening meetings and lectures in connection with the lantern, as it was found more economical than employing a specialist on occasions when the lantern was required. A very fine collection of Indian plants had been purchased, collected by a distinguished botanist, which would be very useful, not only in supplying the Museum with specimens not previously there, but in enabling exchanges to be made with other institutions. This was a very useful and important function, and was much appreciated by other public bodies.

The resolution was unanimously agreed to.

### REPORT OF EXAMINATIONS.

| | Candidates. | | |
|---|---|---|---|
| | Examined. | Passed. | Failed. |
| Scotland:— | | | |
| Major . . . . . . | 3 | 1 | 2 |
| Minor . . . . . . | 97 | 40 | 57 |

*First Examination.*

| Examined. | Passed. | Failed. |
|---|---|---|
| 324 | 185 | 139 |

Ten certificates were received in lieu of the Society's First examination.

### REPORT OF GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitors, stating the progress made with cases placed in their hands. Several defendants had paid penalties, or confessed judgment, and in some cases (which have been reported) judgment was obtained; others are still standing for trial.

Several fresh cases of infringement of the Pharmacy Act were reported to the Committee, and it was recommended that proceedings be taken against the offenders, under the direction of the President.

A communication from the Privy Council, with enclosure in reference to the use of specially shaped bottles for poisons, and calling attention to the sale of poisons by photographic dealers, was considered. The Committee recommended that the Privy Council be informed that, in the opinion of the Council, the remedies suggested would not effect the object desired; also, that proceedings would be and are taken against any unregistered person who was reported to the Registrar to be dealing in poisons within the meaning of the Pharmacy Act, 1868.

Another letter from the Privy Council, enclosing a rider from a coroner's jury with reference to the sale of vermin killers containing strychnine at oil shops, was also considered, and it was recommended that the Privy Council be informed that proceedings would be and are instituted against any unregistered person reported to be selling such vermin killers.

The Council, as usual, went into Committee to hear and discuss the legal portion of the above report.

The PRESIDENT, referring to the communications from the Privy Council, said it frequently happened at inquests that riders were appended to the verdict, referring to the sale of poisons, the juries not understanding the state of the law, or the action which the Society was constantly taking. With regard to the sale of photographic chemicals containing poison by unregistered poisons, he should inform Sir C. L. Peel that proceedings were and would be taken when such cases were reported. Only last week there was such a case in Liverpool, and in many other cases penalties had been recovered without going into court. It was necessary, therefore, that dealers in photographic chemicals, if not registered persons, should weed their lists of all statutory poisons, such as cyanide of potassium, corrosive sublimate, etc., if they wished to escape penalties. It was the practice in all cases to take proceedings where vermin killers containing strychnine were reported to be sold by unregistered persons, and it was something novel for the Council to be urged to do its duty in this respect.

The report and recommendations were adopted, and a special resolution was passed authorising the Registrar to take proceedings against the persons named.

## Proceedings of Societies in London.

### SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, January 25, Mr. Aubrey T. Hill in the chair.

A paper on "Molybdenum and its Reactions" was read by Mr. Arthur Lander, who described the methods of preparing the metal, its characters and properties, and those of its more important compounds, especially the phospho-molybdates, etc. Attention was also directed to a reaction which was generally overlooked, but which the author had found very useful as a qualitative test for ferrocyanides; this consisted in the addition of ammonium molybdate to an acidified solution of a ferrocyanide, when a reddish brown precipitate results, the reaction being very delicate. The author found that the composition of this precipitate had been investigated by Wyrubow, who found it to consist of ferrocyanide of molybdenum when a molybdenum salt was used, or a double ferrocyanide of molybdenum and potassium when a molybdate was employed. The paper was illustrated experimentally, and gave rise to a discussion, in which the Chairman, Secretary, Messrs. Bryan, Henry, Taylor, and Potter took part.

Mr. R. H. Jones then gave the following report:—

## Report on Analytical Chemistry.

BY ROBERT H. JONES.

One feature especially noticeable in looking over accounts of processes recently introduced is the fact that, where possible, volumetric and colorimetric processes are taking the place of gravimetric determinations. The colorimetric method of quantitative analysis is hardly satisfactory, as different manipulators are not always similar judges of colours; but volumetric analysis is not only in most cases of far less trouble and much more speedy, but quite as exact. For example, for the determination of lead, titration with ammonium molybdate solution, using a solution of tannin as an indicator, or the volumetric determination of alkaloids by standard acid, are processes which involve no more error than a gravimetric determination, and certainly take far less time.

I have endeavoured to give you an account of a few processes and tests that you will be able yourselves to try in the laboratory, in the belief that you will be more interested in them than in an account of any elaborate processes requiring a great deal of time and costly apparatus to carry them out.

### *The Detection and Determination of Traces of Arsenic.*

Dr. Clark points out (*J. C. S.*, June, 1893, p. 885), as a result of some experiments he had made, that Fleitmann's test is only available for the detection of arsenious compounds. Thus, heating together 0·2 Gm. arseniate of sodium, with 3 Gms. aluminium in solution of sodium hydrate, and passing the resulting gas through nitrate of silver solution, no reduction took place. With arsenites Fleitmann's test cannot be applied quantitatively, although a very delicate and easily applied test for their detection.

By modifying Reinsch's test, Dr. Clark has devised means of detecting and determining small quantities of arsenic, existing either as arseniates or arsenites. His process consists in boiling the material or liquid to be tested, acidified with hydrochloric acid, with a strip of copper foil. If arsenic or antimony be present and the foil become coated, it is removed and washed first with water, then alcohol, and then with water again. It is then introduced into a mixture of dilute hydrogen peroxide and caustic potash, under the action of which the coating is dissolved and the foil is again rendered quite bright, and can be again boiled with the material and acid, and again placed in the peroxide of hydrogen. The alkaline liquid is now boiled, filtered, concentrated and washed into a small distillation flask with strong hydrochloric acid, ferric chloride is added, the flask is connected with a small condenser fitted with a calcium chloride tube, and the arsenic is distilled into water. By adding hydrochloric acid again, and again distilling, the last traces are obtained.

The distillate is tested for arsenic with sulphuretted hydrogen. If not more than one-tenth of a milligramme is present a coloration only occurs; this can be imitated with a solution of known strength. If more than one-tenth of a milligramme is present, a precipitation occurs; the precipitate is collected, washed with water, alcohol, and carbon disulphide (to remove any sulphur), then with alcohol and water again; it is now dissolved in ammonia, evaporated to dryness, and weighed.

Antimony can be detected or determined in the acid solution from which the arsenic has been distilled by sulphuretted hydrogen.

### *Method of determining Barium in the presence of Calcium and Magnesium.*

(F. W. Mar., *J. S. C. I.*, vol. xii., p. 65).

Barium chloride is soluble in pure concentrated hydrochloric acid only to the extent of 1 part in 20,000. If ether be added, the solubility is decreased to 1 part in 120,000. This is taken advantage of as forming a means of determination when calcium and magnesium are present. The chlorides of the metals are dissolved in the least possible quantity of boiling water, then 25 C.c. of pure concentrated acid added, and, after the liquid has cooled, 5 C.c. of ether. If the acid be added slowly, drop by drop, allowing the precipitate to re-dissolve as long as possible, when obtained it is coarsely crystalline and easy to manipulate. After standing it is collected upon a filter (a Gooch asbestos one is recommended), washed with hydrochloric acid containing 10 per cent of ether, dried and weighed.

The method is said to be very accurate, and the author got some very good results in some trial experiments.

### *Albumin in Urine.*

Spiegler has brought forward lately a test by means of which 1 part of albumin in 225,000 is said to have been detected. It is prepared by dissolving 8 grammes of mercuric chloride, 4 grammes of tartaric acid, and 20 grammes of sugar in 200 C.c. of distilled water. The sugar is added only to increase the relative density of the solution, and may be omitted.

The test is applied by the contact method, by pouring the solution down the side of a test tube containing the urine, so as to form two separate layers of liquid. If albumin be present, a ring of haze appears at the junction of the two layers.

Gurrieri (*B. M. J*, 1715, p. 77) has stated that except hydrochloric acid or a chloride be present, considerable quantities of albumin may remain undetected. However, seldom or never is urine free from salt, so that the precaution recommended of adding a small amount of chloride to the original solution is scarcely necessary. The test is almost too delicate for ordinary use, but in some special cases would be valuable.

### *Determination of Organic Nitrogen.*

(A. Petit and L. Monfet, *J. C. P.*, No. 368, p. 343).

This method, which is stated to be especially applicable to urine, consists in converting it into ammonium sulphate with fuming sulphuric acid and mercury, and liberating it from the ammonium sulphate by alkaline hypobromite.

To 10 C.c. of urine 5 C.c. of the acid is added, drop by drop, and, after heating, a globule of mercury; the liquid is then boiled until decolorised. After cooling, 20 C.c. water is added gradually, and strong solution of soda, until the acid is nearly neutralised, the temperature being kept down. The whole is then made up to 50 C.c., and an aliquot portion (10 C.c.) treated with alkaline hypobromite, as in a determination of urea, and the volume of nitrogen read off.

### *Chlorine in Iodine.*

(F. Ulzey and A. Freidrich, *J. S. C. I.*, xii, p. 65).

For the detection and determination of chlorine in iodine, these authors have devised a very easily applied test. 10 to 20 grammes is dissolved in 100 C.c. of carbon disulphide and the solution introduced into a separator. 5·10 C.c. of water is added, and, after being well shaken, drawn off; this aqueous portion contains the chlorine as iodine chloride, and is titrated with standard solution potassium iodide. As long as a turbidity occurs after each addition, some iodine chloride is still present; when no more cloudiness occurs the reading must be taken.

### *Moisture in Iodine.*

(C. Meincke, *J. S. C. I.*, xii., 550).

This is a very simple process for the determination of moisture in iodine. A known weight is introduced into a test tube, and at once covered with four to five times its weight of recently ignited silver powder. After weighing the tube, it is very gently and carefully heated until all the iodine has combined to form silver iodide. The water vaporises and condenses on the upper part of the tube. After all the iodine has entered into combination, stronger heat can be applied until all the water has been expelled, and the tube, after cooling, is again weighed. The loss in weight corresponds to the moisture. The presence of chlorine or bromine does not interfere with the results, but cyanogen would.

### *Heated Cotton Seed Oil in Lard.*

(*J. S. C. I.*, xii., 869.)

Although silver nitrate affords a very satisfactory means of detecting admixture with cotton seed oil, if a chloroform solution of it be heated with the silver nitrate over a water-bath, when the cotton seed oil has been previously boiled the test fails. Crook has brought forward a test for the boiled oil. About ten grains is placed in a half-ounce porcelain crucible. A white disc of filter paper, first moistened with hydrochloric acid and dried, and then again just moistened with a 12 per cent. solution of silver nitrate, is placed in the concave side of a watch glass and inverted over the capsule, which is heated to 240° F., and the heat immediately withdrawn. A light brown to black coloration indicates cotton seed oil. Even less than one per cent. can be detected with certainty.

### *Determination of Fat in Milk.*

(Weiss, *J. C. S.*, No. 369, p. 396).

30 C.c. of milk is mixed with 3 grammes of solution of soda, and 60 C.c. of light petroleum added in three quantities, well shaking after each addition; 20 grammes of alcohol is next added, and the liquid kept constantly agitated, when separation occurs. After standing for twenty-four hours three layers will have formed, the clear upper one being a solution of the fat. A quantity is measured off, evaporated, dried and weighed.

In connection with milk analysis, it has been proposed to make the presence of nitrates in milk evidence of its adulteration with water, but H. D. Richmond (*Analyst*, xviii., p. 271), after reading a paper recommending such a test, made the experiment of giving some cows 1 gramme of nitre a day with their food. Eight hours after their last dose the cows were milked, and the milk on being tested gave a well-marked reaction for nitrates. Even twenty-four hours after nitrates were still detected, so that as cows frequently drink water containing as much nitrates as this, their presence in milk cannot be set down as evidence of its having been diluted.

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A discussion followed, in which the Chairman, Messrs. Bryan, Kitson, and the Secretary joined. The meeting then adjourned.

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## CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on January 25, Mr. Gane, after concluding his paper (see *ante*, p. 635), moved that "this meeting is of opinion the voluntary code, above mentioned, should be adopted."

This motion was briefly seconded by Mr. R. H. Jones, and in the discussion which followed, Mr. Hill said he fully agreed with Mr. Gane's proposed codes, and thought that they constituted a very high ideal, and one which the Association should be proud of having suggested; he thought it quite time that the Pharmaceutical Society should be empowered to remove the names of offenders from the Register, and hoped that the Council would take immediate steps to obtain such powers.

Mr. Carr could not agree with Mr. Gane that a qualified man was culpable in any way if he lent his services to a company or to a large store, provided he discharged his duty as a trusted intermediary between the physician and the public. He compared a medical man who gave his services to the employés of a large business house or company to a chemist who engaged himself to a store, and thought that as it was perfectly legitimate for a doctor to do that, so it was not wrong for a chemist to do the latter. The reason chemists wanted legislation in the matter of store trading was that their profits were reduced, but reduced profits should have nothing to do with their conduct. Doctors had just the same cause to grumble at their fellow-practitioners who opened a dispensary.

Mr. Strother said it was not the true stores that did the harm, but the cutting men, who very often had no money of their own, and only traded with other people's.

Mr. R. H. Jones was of opinion that they could only obtain redress through the "Society," and ought all to support it for that reason. Speaking of "covering," Mr. Jones said they ought all to remember their duty to their brother chemists, and could not perform that duty if they hired their services to a company, formed to evade the law, so injuring the prospects of the chemists in the immediate neighbourhood, who would not condescend to do business on the same lines. If, after the time and trouble expended in obtaining a qualification, it proved of so little value by reason of these offenders, there ought to be some protection from or remedy against them. Mr. Carr's parallel of a doctor to a business firm and a chemist covering a company was a very bad one, and he failed to see any similarity. If a doctor were to let his services out to a number of unqualified men so that they could practice as medical men, he would be committing a great offence, and surely a chemist was equally to blame for doing practically the same thing.

Mr. Chaston thought it was a mistake to make a voluntary and a compulsory code; it should all be compulsory. Mr. Gane had not mentioned "chemists prescribing," which was a grave offence, and ought to be put down. The question of qualified men acting as assistants to stores was greatly over-rated.

Mr. W. E. Plant thought Mr. Gane had approached the subject from a wrong point; he was wrong in speaking of chemists as professional men, and their life as a professional one. They were only tradesmen. In a man's apprentice days he had to work at the trade, but when he went to study for a twelvemonth for his examinations, he obtained some professional knowledge. This was of little use to him when he returned to business, and an employer would prefer a man who had a good trade knowledge to one who only possessed a professional one. Chemists had to work too long in the day to be able to undertake any professional work. Touching upon secret remedies, if they discouraged the sale of these they would all be cutting away their living, as in many businesses these formed a considerable item in the proceeds, and were considered of especial value when a business was sold. Prices needed to be discussed by chemists and some conclusions arrived at to enable them to charge more uniformly.

Mr. J. H. Andrews was glad Mr. Gane had left "prices" out of his opening remarks, for it was very dangerous ground, and chemists must be prepared to be independent and to act individually in the matter. It was, he thought, very essential that a youth should have passed the Preliminary examination before entering upon his apprenticeship.

Mr. Long did not believe in discouraging the sale of secret remedies, by which he meant proprietary articles, which were quite different from some of the quack nostrums advertised in the newspapers. If the age at which an assistant is to be qualified were to be limited to the age of twenty-three, it would entail a considerable amount of hardship on some men, for it was not always convenient, nor was it sometimes possible, for men to enter for their examination so soon. The case cited by Mr. Carr of a medical man giving medicine and advice to the employés of large firms was, in his opinion, very commendable, for it was intended to be a benefit to the poorer classes, whereas the stores and drug companies did not cater for the poor people, or if they did, they did not benefit by it. Of the compulsory clauses suggested, he should give his especial support to the "covering" one.

Mr. Sage gave his support to Mr. Gane's two motions, and thought that advertising by chemists should not be indulged in to so great an extent. This was dealt with in the first clause of the code of ethics approved by the Institute of Chemistry, and was decidedly derogatory to a chemist. He thought that the only way possible to get men to obey any such code would be to get the Pharmaceutical Society to obtain the necessary power, and then when men were qualified they should be granted an annual licence after they had agreed to abide by the rules of the Society. At the present time men agreed to carry out the rules of the Society when they made application to become members. Why should not every qualified man agree, and connect himself with the Society by paying an annual subscription in return for a nominal licence. Mr. Carr seemed to be labouring under a wrong impression, for Mr. Gane did not mean by his "covering" clause to prohibit a man from serving the stores, many of which were carried on in strict obedience to the law, but to prohibit a man from serving a company formed purposely to evade the Pharmacy Act. How would Mr. Gane separate proprietary articles from secret nostrums? Mr. Sage failed to see how it could be done, and thought great difficulty would be involved in the attempt.

Mr. W. Anderson said that diminished profits accounted in great measure for the prevalent dissatisfaction, and because profits were not as good as at one time, they could not improve them by applying to the Society to enforce a code of ethics. If such a code were to become part of the rules of the Society, and they obtained powers to enforce it, the effects would differ tremendously with chemists; one in the East end would find it a hardship perhaps, while one in the West would think it an insult. It would be a great hardship to make all men qualify by the time they were twenty-three, and for pecuniary reasons some men would be unable to manage it in two years.

Mr. Roe thought it would be too severe a penalty to strike a man's name off the Register for some of the minor offences mentioned.

The President said no one needed to attend many of the Association's meetings, or any meetings of pharmacists, before they would discover that somehow things were in a bad way, and something needed altering. There were two courses they could follow, one to do the best to alter things, the other to let them go on in the same rut. There was a strong temptation to put their hands in their pockets and let things slide and work themselves out, but this was not a good way, and they should try to do something, and even if they failed in their attempt it would be a lesson learnt towards helping them to do better next time. It was not any use urging the Pharmaceutical Society to get more powers; it was no good formulating a voluntary code of ethics, and stopping there, they must be prepared to carry it out. They must first assure the Society that it was their wish that something should be done, and this would be best done by passing the resolutions before the meeting. They must not suppose that they could move a resolution and the Society get an Act of Parliament empowering them to deal with the matter immediately, but by registering their opinion and wishes, they would strengthen the power of the Society. If the voluntary code could be adopted temporarily, it would be a stepping stone to a compulsory code, or if it was universally adopted, things would gradually improve, and it being the customary conduct of chemists, there would be no need to enforce it by law. In not engaging unqualified assistants over twenty-three years of age, chemists would be benefiting assistants generally, and men would not be limited, as some members had suggested, to two years in which to do their study; they could be prepared, as many were even now, before they were twenty-one. There were many reasons why qualified men should not lend themselves to companies which were formed to evade the law; the fact that in these establishments the quality of drugs was allowed to run down in consideration of price was demoralising, and tended to run down our semi-professional status. It would be almost a Utopian idea to expect that chemists should entirely give up selling proprietary articles and secret remedies, but it was a thing to be desired.

Mr. J. Anderson Russell, of Glasgow, in a letter expressed his sympathy and good wishes for the movement. He thought quackery should be one of the offences included in any code formulated, and that company pharmacy should be thoroughly discussed before any steps were taken with reference to it. With regard to the penal clauses of a compulsory code, it would be first of all necessary to get the power now vested in the Privy Council transferred to the Society (*vide* Pharmacy Act, 1868, sec. 26).

Mr. Gane, in replying, said he was sorry some of the gentlemen present had such a poor idea of their calling, for unquestionably their duties were partly professional, and differed from the trades of a grocer or a draper. He thought, after the opinions that had been expressed, that it was very necessary to have a code of ethics for the guidance of their conduct. He had suggested the limitation of the qualifying age for the assistants' benefit, for men who could not or would not take the trouble to qualify by that time were the very ones who caused the mischief now by still carrying on their business without being qualified. He had especially refrained from entering upon the question of prices, for it was a subject surrounded with difficulties. Regarding secret remedies, he drew a distinction between them and proprietary articles, but if chemists did encourage the sale of secret remedies they would be unlikely to improve their relations with medical men. Chemists must not grumble because doctors did their own dispensing, as long as they prescribed over the counter. "Covering" was a distinct breach of faith to the public, to medical men, and to their brother chemists. The question of making the subscription to the Society the payment for an annual licence was a suggestion he had received from Mr. Anderson Russell, of Glasgow, to whom, and also to the President of the Association, he was indebted for many valuable suggestions.

The President then put the resolutions to the meeting, and they were both carried by an overwhelming majority.

A musical and social evening in connection with the Association was held at 103, Great Russell Street, on Thursday, February 1, under the direction of Mr. H. H. Robins. The chair was taken by Mr. J. C. Umney, and a very enjoyable evening was spent.

## ROYAL MICROSCOPICAL SOCIETY.

The annual meeting was held on January 17, Mr. A. D. Michael, F.L.S., President, in the chair. After the report of the Council for the past year and the treasurer's statement of accounts had been read and adopted, the President announced that the following were elected as officers and Council for the ensuing year:—President, A. D. Michael, F.L.S.; Vice-Presidents, Professor L. S. Beale, F.R.S., Dr. R. Braithwaite, Frank Crisp, L.S.B., T. H. Powell; Treasurer, W. T. Suffolk; Secretaries, Professor F. Jeffrey Bell, M.A., Rev. Dr. W. H. Dallinger, F.R.S.; ordinary members of Council, A. W. Bennett, M.A., Rev. E. Carr, M.A., E. Dadswell, C. H. Gill, F.C.S., Dr. R. G. Hebb, M.A., G. C. Karop, M.R.C.S., E. M. Nelson, Professor Urban Pritchard, M.D., C. F. Rousselet, Professor Charles Stewart, Pres. L.S., J. J. Vezey, T. C. White, M.R.C.S.

The President then delivered the annual address, taking for his subject the growth and present state of our knowledge of the Acari. The name "Acarus" was probably first used by Aristotle. It means too short to be cut, but Aristotle did not anticipate Cambridge rocking microtomes, and a set of over 120 serial sections now exhibited was cut from a far smaller Acarus than Aristotle could ever have seen. The President then described what an Acarus really is, and in what respects it differs from other Arachnida; a distinction which is erroneously stated in almost all text-books of zoology. The classification of the group practically began with Linnæus. It was shown how difficult it is to identify a Linnean species; and the progress of classification was shortly traced from the single Linnean genus to the 212 genera admitted by Trouessant, one of the latest writers on the subject. The President then referred to the fact that many of the predatory Acari had not any special organs of vision, and yet they were most active creatures, and would catch such agile insects as Thyranuridæ without constructing any web or trap, and did not seem to suffer in the least from their eyeless condition. He had seen small and weak Acari quietly waiting until larger ones had finished feeding before they ventured to attack the leavings, although both were blind. The various forms of acarine parasitism and commensualism were then described, including a parasite of the rabbit which lives in its fur, not to hurt the rabbit, but to feed on other parasites which really do so, and the number of these which it will destroy is amazing. The President then illustrated the principal families of Acari by selecting one or two instances of each which were specially interesting, either from their habits, their anatomy, or otherwise. The Sarcoptidæ, or bird parasites, were represented by a parasite of the cormorant, discovered by the President, in which the male has one leg much larger than the others, and the skeleton of the body is greatly modified to support it; but the enlarged leg and modified skeleton are on the right side of the body in some specimens, and on the left in others. The so-called cheese-mites were referred to in order to describe the hypopus-stage in the life-history of many of them, when the creature, which is originally soft and easily killed by heat or exposure, suddenly becomes hard and able to endure almost all vicissitudes, and also to live for a long period without eating; it is then provided with special organs for adhering to insects, and thus the species are widely distributed, under circumstances where they would otherwise perish. The President then spoke of his recent researches into the association between many Acari (Gamasids) and certain ants in whose nests they live, and of a still stranger and hitherto unrecorded case even more lately observed by him, in which a species of Acarus (Bdella) lives habitually in a spider's web in harmony with the otherwise most ferocious occupant. The speaker then shortly described his recent discovery of the extraordinary way in which female Gamasids are fertilised, a spermatic capsule being conveyed to its destination by the mandible of the male. Finally the descent of the Acari was discussed. The discourse was illustrated by the lantern.

# Provincial Transactions.

## BLACKPOOL CHEMISTS' DINNER.

The fourth annual dinner of the Blackpool chemists took place on Monday evening, January 22, at Mr. Sedgewick's, Central Beach. After the usual loyal and patriotic toasts, "The Town and Trade of Blackpool" was proposed by Mr. Carter, and responded to by Mr. Jackson; "The Chemists' Dinner," by Mr. Chadwick and Mr. Turner respectively; "The Pharmaceutical Society," Mr. Richardson and Mr. Laurie; Mr. O. Jackson proposed "The Visitors," and Mr. J. H. Taylor (St. Anne's) responded.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

A meeting of this Society was held on January 25, Mr. F. Walker, President, in the chair. Dr. J. B. Nevins, a leading Liverpool physician, delivered an interesting lecture on "Reminiscences of Fifty Years of Pharmacy." He showed, in the course of his remarks, that then, as now, there was a fashion in medicine as in other things, and greatly amused his hearers by recounting how the dandies of the day carried a little piece of rhubarb root with them, and imagined they were troubled with all sorts of things simply because some royalty was afflicted. At that time it was customary to prescribe medicines according to their inventor's or discoverer's names, more so than at present. For instance, a doctor always wrote Pulv. Doveri, Spir. Mindererus, Liq. Fowleri, Pulv. Gregorii, etc. Dr. Nevins traced the history of liq. ammon. acet., pulv. rhei co., pulv. antimonialis, and other medicines in an interesting and amusing manner. Having described the calf's bladder enema, which was then in use, Higginson's rubber enema not then being known, the lecturer detailed the reasons and arguments in favour of blood-letting, which greatly prevailed at that time. Doctors did nearly all their own dispensing, and a favourite mode of prescribing then for certain troubles was in the form of an effervescent mixture. This was generally dispensed in small vials, each holding one draught, the doctor charging about one shilling for each bottle. Hydrarg. c. creta, pil. hydrarg., and similar preparations were made by the apprentice instead of being purchased from the wholesale house. Dr. Nevins concluded his lecture by referring to the latest development of medical treatment in the use of animal extracts. The lecture was profusely illustrated with materia medica specimens, old coloured prints, etc. A hearty vote of thanks, proposed by Mr. T. H. Wardleworth, seconded by Mr. R. H. Mitchell, and supported by Messrs. Wokes, Parkinson, Shacklady, Cowley, and the President, was accorded to the lecturer.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

At the meeting held on Thursday, the 25th ult., a paper was read on "Pepsine, Pancreatine, and the Allied Digestive Ferments," by Mr. A. Ivatt, M.A., Lecturer on Pharmacy at Christ and Sidney Colleges. At the conclusion a hearty vote of thanks was passed, on the proposition of Mr. Alderman Deck, to Mr. Ivatt for his very instructive and interesting paper.

## BRIGHTON JUNIOR ASSOCIATION OF PHARMACY.

The fourth annual Junior Pharmacy Ball, which took place at the Royal Pavilion, Brighton, on January 31, was one of the most successful of the series. There was a large gathering, over 160 being present, and dancing was kept up from nine o'clock till after three next morning.

## BRISTOL PHARMACEUTICAL ASSOCIATION.

On January 22 the annual meeting of the members was held at University College, Bristol. The financial statement was made by the treasurer. The following members were elected as Council for the year, viz.: Messrs. Allen, Berry, Keen, Pitchford, Plumley, Schacht, Stroud, Towerzy, Warren, and White. At a subsequent council meeting the following officers were elected:—President, Mr. Berry; Treasurer, Mr. Stroud; Secretary, B. Keen.

## Scottish Transactions.

### EDINBURGH AND DISTRICT CHEMISTS' TRADE ASSOCIATION.

A meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Tuesday, January 30, at 9 p.m., Mr. G. H. Laird in the chair.

The minutes of last meeting were read and approved, and an apology for absence was intimated from Mr. Nesbit, Portobello.

Five new members were elected, and eleven were nominated for election at next meeting.

Mr. C. F. Henry, Secretary, read the report of the Committee on the proposed action anent amendment of the Medicine Stamp Act, which recommended that no action be taken at present, in view of the proceedings being taken by the British Medical Association. It was further recommended that the matter be left in the hands of the Committee.

The report was adopted, and, on the suggestion of the Secretary, a discussion took place on the resolutions recently adopted by the Nottingham and Notts Chemists' Association (*Pharm. Journ.*, [3], xxiv., p. 133). The first resolution was not agreed to, on the ground that the Department must be allowed to carry out their official duties in their own way. The second resolution was agreed to. The third resolution was agreed to, with the modification that all official and officinal preparations should be exempted from stamp duty, and that permission should be given to put upon them the doses and uses. The word officinal to be held as including all preparations made according to formulæ published in standard books.

Mr. Macpherson stated that he was informed by a printer that the Inland Revenue Authorities had indicated their willingness to exempt all preparations made according to the British Pharmacopœia and any pharmacopœia, such as Martindale's 'Extra Pharmacopœia.'

Resolution four was regarded as being included in the modified form of the foregoing resolution, and resolution five, as to the use of the possessive case, was also agreed to.

The Secretary read the report of the Special Committee appointed at last meeting to inquire as to the extent to which soluble blue containing oxalic acid was sold by grocers and others. The Committee reported that this article was very generally sold by such traders in Edinburgh and district. The poisonous blue was sent out in packets or bottles without any poison label upon them. In one case a grocer used five pounds of oxalic acid every month in his retail shop, and sold the blue both wholesale and retail. The Committee stated that such sales were distinctly illegal, and from the loose way in which the poison was sent out there was a danger to the public. They recommended that public attention should be drawn to the subject by letters in the public press, so that grocers and others might have warning that they were breaking the law.

A sample of the soluble blue in liquid form had been analysed and found to consist of—

| | |
|---|---|
| Oxalic acid ......................... | 7·09 grains. |
| Prussian blue ............. | 30·33 grains. |
| Water ......................... | 6 fluid ounces. |

That is, 0·27 per cent. oxalic acid and 1·15 per cent. Prussian blue. This was sent out in an empty ketchup bottle and sold for one penny, bottle and all.

After discussion the Chairman, Secretary, and Mr. Glass were appointed to write to the press, and it was also resolved to send a report of the meeting to the Edinburgh newspapers.

The Secretary then submitted a large number of new labels which had been marked "liable" or "not liable" by Somerset House authorities. From these it appeared that such words as "antispasmodic" or "stimulant" might be put on the label without incurring liability, but if any ailment was mentioned the label thereby became liable. The Secretary said that practically meant that you could put matter on the label that was unintelligible to the general public without liability, but the moment you put upon it anything that the public could understand you had to pay the duty.

The Association then went into committee to consider private business.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, the 1st inst., Mr. W. L. Currie presided, and introduced Dr. T. H. Bryce, who gave a lecture on "The Human Hand." The lecture was very fully illustrated with numerous charts, and an enthusiastic vote of thanks was accorded on the motion of Mr. A. Boyd.

The President, on behalf of his father, made a handsome presentation to the library—the 'Compendium of Medicine of the United States'—for which Mr. Robb expressed the thanks of the Association.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACT.

#### SALE OF POWELL'S BALSAM OF ANISEED BY A GROCER.

At the Bloomsbury Court, on Tuesday, the 6th inst., before his Honour Judge Bacon, the Pharmaceutical Society of Great Britain sued E. Aldersley, grocer, 63, Denmark Hill, S.E., for a penalty of £5, for keeping open shop for the retailing, dispensing, or compounding poison, to wit, a prepartion of morphine contained in a compound known as "Powell's Balsam of Aniseed," contrary to section 15 of the Pharmacy Act, 1868.

Mr. T. R. Grey, instructed by Messrs. Flux, Son and Co., for the plaintiffs, and Mr. Bonsey, instructed by Messrs. Neve and Beck, for the defendant.

Mr. Grey: This, sir, is an action to recover a penalty of £5 for keeping an open shop for the retailing, dispensing, and compounding of poison contrary to the provisions of the Pharmacy Act, 1868. The defendant is a grocer carrying on business at 63, Denmark Hill, and sold on October 10 a bottle of medicine called "Powell's Balsam of Aniseed." That is a proprietary medicine, and it has been analysed and discovered that there is morphine in it, which is a poison within the Act.

The Judge: What was the drug in the last case?

Mr. Grey: There was one case about chlorodyne.

The Judge: That was the case before me. I thought there was a later case, in which somebody has held that there was not enough morphine.

Mr. Grey: That was the case against Delve. The compound in that case was called "Licoricine," and the poison there was the same as in this case—morphine—but no evidence was given as to the quantity in that case in order to raise the point of law. The Divisional Court held that the County Court judge was right, that there was not sufficient evidence, and therefore they would not overrule it.

Mr. Bonsey: There was evidence that there was some poison.

Mr. Grey: The Act is the 31st and 32nd Vic. c. 121.

The Judge: I having decided the chlorodyne case, you must bring this case within the chlorodyne case, that is, that there is an appreciable quantity of morphine in this Powell's balsam of aniseed. I will decide that as I did the chlorodyne case; it is clearly a question of evidence.

Mr. Grey: If that is so I will call my evidence at once.

The Judge: Why do not the grocers of England, or somebody of that sort, get the Act of Parliament defined in some way? To wrangle with each one of these proprietary medicines seems to be a waste of power.

Mr. John Partridge was then called, and deposed to having purchased on October 10 last from Mr. Aldersley, of 63, Denmark Hill, a bottle of Powell's balsam of aniseed for 10½d. This bottle he handed to Dr. Paul.

Dr. Benjamin Horatio Paul was then called.—What are you, Dr. Paul?—An analytical chemist.

You have a large experience as an analyst?—Yes.

On November 15, 1893, did you receive from the last witness a package containing a bottle?—Yes.

What did you do with it when he brought it to you?—I analysed it.

What did you find in it?—Morphine.

What is morphine?—The active principle of opium.

The Judge: It is so defined in the Act.

Mr. Grey: It is a preparation of opium?—Yes.

What amount of morphine did you find?—Four-tenths of a grain to a fluid ounce. This bottle holds rather more than a fluid ounce.

You have, as a matter of fact, obtained part of the morphine in a crystalline form, and if necessary you can produce it?—Yes.

With regard to the dangerous quality of morphine, would it be injurious to the health of a human being in that quantity?—I should say so.

The Judge: Four-tenths of a grain?—Yes.

Mr. Grey: What effect would it have on children?—It would be poisonous.

The Judge: When you say morphine is a preparation of opium, is it pure opium, or what is it mixed with?—It is the active principle of opium, and represents about one-tenth part of the opium in ordinary use as a drug.

Can you say from your own knowledge what would be the effect of a grain of morphine?—I can only speak as to general knowledge that very small doses of opium or morphine are very dangerous, and very often fatal to children.

Cross-examined by Mr. Bonsey.—If I understand you right, Dr. Paul, morphia, or morphine, is one of the many alkaloids of opium?—Yes.

There are, I think, about nineteen or more ascertained, are there not?—There are a great many.

That is not overstating the numbers?—No, I think not.

That bottle contains about a fluid oz.?—Rather more.

You say four-tenths of a grain is contained in the bottle?—Yes.

Therefore there would not be so much as four-tenths of a grain in the fluid ounce?—It contains four-tenths in the fluid ounce; the bottle contained more than a fluid ounce.

Are you perfectly certain that that is accurate?—Quite certin.

Is not aafluid oz. a small quantity to analyse?—No.

Are you acquainted with the test which is to be found in the British Pharmacopœia, the test for analysin gopium?—Yes.

Is not the quantity given there very much larger?—I believe it is.

I put it to you that it is very difficult to ascertain the exact amount of morphine in about three or four grains of opium?—No, I should say not.

In the British Pharmacopœia the test is:—Opium 140 grains, lime 60 grains, chloride of ammonium 40 grains, rectified spirit, ether, and distilled water a sufficiency. There they seem to think it necessary to take 140 grains?

The Judge: It may be more convenient; but is it necessary that you should have that quantity?

Mr. Bonsey: Yes, it is a very difficult thing to take a small quantity.

The Judge: That must depend upon the skill of the analytical chemist.

Mr. Bonsey: It depends upon the process. Did you proceed according to the process of analysis in the British Pharmacopœia?—No.

You did not adopt that?—No. That process is wholly inapplicable to the purpose.

Because the quantity is so small?—No; not only that; that is partially the reason. That process is adapted for a rough examination of the drug opium.

Would you tell me what process you adopted?—The process that I adopted was to extract the balsam—the contents of this bottle—with amylic alcohol, adding a sufficient quantity of ammonia to liberate the alkaloid. The extract contained in the amylic alcohol was evaporated and dried, and the residue neutralised by means of a weak acid, a measured quantity of which represented a known quantity of morphine. The acid liquid required for that purpose was the measure of the alkaloid in the residue. After that had been done the alkaloid was separated and identified.

Did your analysis depend in any way upon the assumption that morphine is 10 per cent. of opium?—Not at all. That had nothing at all to do with it.

Did you separate the alkaloids and opium from the other substances in the bottle first?—No. I would not dream of such a thing.

According to your analysis, whether the opium contained 10 per cent. of morphine or not was immaterial?—Not at all material.

We know that the quantity of morphine in opium varies?—Very much.

From 6 to 16 per cent.?—From nothing to 16 per cent.

But 10 per cent. is the strength adopted by the British Pharmacopœia?—That is the strength prescribed by the British Pharmacopœia.

But it does not follow that when a person is making up a compound otherwise than according to the British Pharmacopœia the opium would be of that strength?—Not at all.

The Judge: He could not have used a very weak quality of opium if the bottle contains as much morphine as Dr. Paul says it does.

Mr. Bonsey: Were you making your analysis for opium or for morphine to start with?—For morphine.

Not for opium at all?—No. The means of determining the amount of opium is not a subject of analysis at all.

The Judge: Is the opium of commerce a powder?—No, it is a sort of gummy mass.

Rubbish gets into it, and it may become adulterated?—Yes, very largely.

Mr. Bonsey: Would it surprise you in any way to hear that other analyses have been made which have discovered under three-tenths of a grain? Are you prepared to swear that your analysis is perfectly accurate, and that it contained more than three-tenths of a grain?—Certainly. I may tell you that this preparation is liable to great variation in the amount of morphine that it contains.

Why do you say that?—Because I have found it so in different bottles.

Then perhaps you have found it sometimes to be under three-tenths of a grain?—I have.

The Judge: Was that when analysing a bottle that had been opened?—No.

They were all unopened bottles, and they varied?—Yes. I first noticed this variation about six months ago, and since that time I have analysed a large number of bottles of Powell's balsam, and I have found a remarkable difference within that period.

Mr. Bonsey: Is not four-tenths of a grain the maximum amount that you have found?—No.

What is the highest that you have found?—Nearly half a grain.

Were the majority of the bottles that you analysed under three-tenths of a grain?—Yes, recently, especially those not marked "poison."

Do not all tinctures or preparations of opium vary very much in that way?—No, tincture of opium is a constant quantity.

Have you not in some of these bottles found 0·24 or 0·25 grain about the quantity?—Yes; some even less than that.

The Judge: What do you say is the lowest; you have given me the maximum?—One-tenth of a grain of morphine to the fluid ounce.

They vary really from one-tenth to nearly five-tenths?—Yes.

Mr. Bonsey: And you say the majority are under three-tenths?—Latterly.

There are two alkaloids, one called codeine and the other thebaine?—Those are among the alkaloids that exist in opium to a very infinitesimal extent.

Would not those be included with the morphine?—Those have been included so far as the titration—the measurement by the acid solution—is concerned, but a subsequent check was applied for the identification of the substance so measured.

Is not the figure that you have given us based upon the acid?—Yes, that is so.

And the acid includes those two items?—It would include those items certainly, but they are so infinitesimal that they would not affect the result materially.

Am I not right in saying that your result as a matter of fact does include those two alkaloids if they exist?—If they exist in any appreciable quantity the result would be affected by them, but inasmuch as they do not, and inasmuch as the alkaloid was afterwards identified as morphine, that would not affect it.

To put it in another way, your process does not separate those two alkaloids from the morphine?—No.

The Judge: What have you in that bottle?—That is the remainder of the morphine crystallised, and identified as morphine?

Mr. Bonsey: What was the colour of the residue after you had applied the alcohol in the first instance?—It was a pale brownish colour.

This balsam contains a number of other ingredients?—Yes.

You only analysed for the one thing?—I analysed for all the contents.

Were there six or eight different things in it?—There was benzoic acid.

Were there six or eight?—Possibly.

Was there anything, in your opinion, in the other ingredients which would counteract in any way the effect of the morphine?—Not at all.

Is not the dose of morphine prescribed by the British Pharmacopœia from one-eighth to one-half a grain?—Yes, for an adult dose.

There is no distinction drawn in the British Pharmacopœia between adults and children?—No, I think not.

Therefore, within the limits there prescribed, you would not call this drug a poison?—Yes, it is a poison in any limit.

Suppose you had a compound of which one of the ingredients is one-eighth of a grain of morphine, would you call that a poison or a medicine?—It would be a poison to the extent of the amount of poison that was in it.

Suppose a medicine was prescribed by a doctor which contained one-eighth of a grain of morphine, which is the smallest amount prescribed by the British Pharmacopœia, would you call that bottle of medicine a poison?—From one point of view it would be a poison, from another it would be a medicine.

Would it not from every reasonable point of view be a medicine?—Yes, it might be a medicine if it was ordered properly.

The doses in the British Pharmacopœia are medicinal doses, are they not?—Yes, medicinal doses of poison.

That is to say, it is a thing which you call a poison administered in such a way that it will not kill?—Administered under control.

The Judge: Under the Act a person who possesses a knowledge of medicine may prescribe, and is not punishable for prescribing a poison. A doctor is allowed to give a dose according to his judgment.

Mr. Bonsey: The doses prescribed by the British Pharmacopœia are medicinal doses of poison in some instances?—Yes.

The Judge: It is a poison prescribed as medicine?—It is not the less a poison.

Mr. Bonsey: I dare say from your view of the Act it is not. Is there not a distinction between a medicine and a poison?

The Judge: It does not follow that strychnine is not a poison because homœopathic doctors prescribe it. If you eat too much plum pudding it may become a poison.

Mr. Bonsey: Within the limits prescribed by the British Pharmacopœia it would not be poisonous in its effect?—It depends upon whom it is given to; for some adults who are suffering from certain diseases the minimum quantity would be a dangerous dose.

Then the one-eighth of a grain of morphine would be dangerous to an adult?—Yes. There are many medical authorities who will tell you that one-eighth of a grain of morphine would be dangerous to some adults.

I find in the British Pharmacopœia there is a prescription form for morphine lozenges; it says each lozenge is to contain one thirty-sixth of a grain of hydrochlorate of morphine, and the dose is 1 up to 6 lozenges. Would you call that lozenge made up according to the British Pharmacopœia poison in its effect?—It may be a poison in its effect; and it is poison in fact.

That would depend upon the number taken?—It is a poison.

I suppose the limits in the British Pharmacopœia are within the lines of safety?—Yes, but they are very rough ones.

Re-examined by Mr. Grey.—Are not the prescriptions in the British Pharmacopœia by medical men?—Yes.

The Judge: Is it not produced by the combination of various learned societies?—Mr. Grey: Yes.

As a guide to medical men?—Yes.

In your cross-examination you said there were nineteen other alkaloids or more. With regard to the eighteen others, in what quantity are they in relation to morphine?—So minute that they are only obtainable from factories where they work opium by the cwt.

It has been put to you that two-fifths of a grain has never before been tested for; is that so?—No.

Tests have been made for much smaller quantities, have they not, especially in poisoning cases?—Very much.

Do I understand you to say that the substance in Powell's balsam varies considerably?—Yes.

If the amount of morphine varies, would that be more dangerous or the reverse to people accustomed to taking it?—Yes, I should say there is great risk incurred by the variation.

Dr. Luff, examined by Mr. Grey.—You are a doctor of medicine, lecturer on medical jurisprudence and toxicology at St. Mary's Hospital, examiner in forensic medicine at the London University, and one of the official analysts to the Home Office?—Yes.

Have you heard Dr. Paul's evidence, especially with regard to the process by which he extracted this morphine?—I have.

Do you agree that it is a proper test for deciding whether there was a poison in that bottle?—It was in every way a proper method of extracting the morphine.

You have heard that he found two-fifths of a grain to the fluid ounce. How would that affect, first of all, an adult in good health?—I must first say that to my mind a poison is a substance that not necessarily kills, but which injuriously affects health. That I take to be a poison.

The Judge: What do you say as to strychnine?—It may either kill or injuriously affect the health.

Or it may do good?—It may.

If you take a fatal dose it will kill you?—Yes.

In smaller doses it may do a little harm?—Yes.

And in a still smaller dose it may do a great deal of good?—Yes; but still it is to my mind a poison.

Mr. Grey: Is that the definition also in a learned work by Mr. Taylor?—I do not remember the actual words, but I know Taylor defines a poison as a substance capable of either injuriously affecting health or of destroying life.

With regard to two-fifths of a grain of morphine, what effect would that have upon a human being?—On an adult in ordinary health such a dose might have a decidedly injurious effect. On an adult suffering from certain diseases it would have a more injurious effect, and might prove fatal in certain cases. Upon young children that dose would very probably have a fatal effect.

Cross-examined by Mr. Bonsey.—The effect of the poison depends on the quantity?—Yes.

Your definition of poison really comes back to that; it is a question of quantity?—It depends also on the individual, and the condition of the individual.

We must take the average individual?—But anybody may take such a drug as we have under consideration.

Is half a grain of morphine a poisonous dose to an adult in ordinary health?—What do you mean by the term "poisonous"? If you mean may it injuriously affect health, I should say certainly.

Would it kill an adult in ordinary health?—In all probability it would not, but it would injuriously affect him.

Half a grain is the limit prescribed in the British Pharmacopœia?—Yes.

The British Pharmacopœia is for the guidance of people who have to make up prescriptions?—It is for the guidance, I take it, of medical men, subject of course to their knowledge of the individual.

Then I take it that the maximum dose would be within the bounds of safety to an ordinary person?—No, not necessarily.

Surely the dose prescribed there would not be deadly to an ordinary person?—I would not like to say that it would not be injurious.

Do you mean to say that the dose prescribed by the British Pharmacopœia would be deadly in effect to an adult in an ordinary state of health? Is the dose in the British Pharmacopœia fatal to an ordinary adult?—In ordinary health, you mean?

Yes?—I would not like to say it would not be.

Are the doses prescribed in the British Pharmacopœia where poisons come in question fatal?—I should say generally they are not fatal to ordinary adults.

I understand that your idea is that everything is a poison in which one of the ingredients is a poison within the Act?—Certainly.

Irrespective of quantity altogether?—Certainly. I say it is a poison if it will injure health.

Irrespective of quantity?—The quantity would not enter into the consideration.

You are acquainted probably with the morphine lozenge?—Yes.

That lozenge contains one thirty-sixth of a grain of morphine, and the dose prescribed is one to six lozenges; you would not say that the dose there prescribed is a fatal dose?—Not necessarily, because they would be given under the direction of a medical man.

You know that on these bottles of Powell's balsam of aniseed that are sold there are directions for use for different ages, and so forth?—I have not read the label.

The Judge: Have you taken any of it?—No.

Mr. Bonsey: Do you mean to say that the contents of this bottle would kill an adult in ordinary health?—No; I think it might injuriously affect an adult in ordinary health, but would not have a fatal effect. Persons in good health do not usually take medicines.

The Judge: You mean unless he had some complication of diseases?—Yes, unless he was suffering from disease that would prevent the morphine from getting out of his system.

Mr. Bonsey: I see there are the directions on the bottle.

The Judge: That can have nothing to do with the case before me. If the doses are not prescribed in any way by a medical man they are not saved from the operation of the Act.

Re-examined by Mr. Grey.—With regard to the quantity of two-fifths of a grain, have you known much smaller doses than that actually prove fatal to infants?—Much smaller doses.

Mr. Grey: Then, sir, I put in the Register, in which it will be found that the defendant's name does not appear.

The Judge: That is admitted, I suppose, Mr. Bonsey?

Mr. Bonsey: Yes, sir.

Mr. Grey: Then that will be our case.

Mr. Henry Davies, examined by Mr. Bonsey.—You are an analytical chemist, practising at Liverpool?—Yes.

Have you analysed an ounce bottle of this balsam?—I have analysed two bottles at different times.

What was the result as to the quantity of morphine?—In one I found ·25 and in the other ·24 of a grain of morphine to the ounce.

Do you agree that the mode of analysis described by Dr. Paul is certain to be accurate?—I think with a very small quantity of morphine, such as is found here, that it would be liable to variations; there might be thebaine and codeine, which might amount to more than one-tenth of the whole, that is to say, instead of ·4 it might be ·37 of a grain of morphine.

I believe you have not analysed the bottle in question?—No.

The Judge: I must decide upon the analysis before me of this bottle. I am not to say that because another bottle is so and so, this bottle does not contain what Dr. Paul said it did.

Mr. Bonsey: It has been said in some cases that because the defendant could not analyse the same bottle he must do the nearest thing he can.

Cross-examined by Mr. Grey.—Do you say that when Dr. Paul says he found four-tenths of a grain in that bottle he was wrong?—I do not know whether Dr. Paul meant to convey the impression that in the method he gave he described all the details, otherwise I should have said that it required further purification.

Are not thebaine and codeine very dangerous?—I do not know what their effect is. I only say that in the statement of the amount of morphine which is contained in a certain quantity of opium they must be measured.

Do you not know that they are very dangerous poisons?—They may possibly be, but I do not think so.

Is there anything else in which you disagree with Dr. Paul except that there possibly may have been a little less than ·4?—Generally speaking, assuming the accuracy of Dr. Paul's analysis, which I have no reason to doubt, that would be the effect.

Mr. Bonsey: I am in some difficulty, your Honour, in consequence of Piper's case, which went to the Divisional Court, but which unfortunately for some reason was not carried to the Court of Appeal. I submit that this case is clearly distinguishable from Piper's case. I know that my learned friend contends, on behalf of his clients, that it is quite sufficient to show that one of the ingredients of this compound is a poison, and that it matters not in the slightest degree what the quantity of that ingredient is. That is the contention that was put forward on behalf of the Pharmaceutical Society in Piper's case. The extreme contention on the other side was that it did not apply to a compound at all of which one of the ingredients was a poison. The court decided against us both. All they decided was that it may apply where one of the ingredients is a poison, but that it is not sufficient merely to show that one of the ingredients is a poison. The pith of the case is to be found in a few sentences in Mr. Justice Collins's judgment, and they show clearly what the case decided.

The learned counsel then proceeded to quote at length from the judgment of Mr. Justice Collins in the case of the Pharmaceutical Society *v.* Piper, already reported in these columns.

The Judge: Surely Mr. Justice Collins could not suppose that you could sell enough poison to kill an infant, and yet not be amenable to the Act.

Mr. Bonsey: I submit that it is the reasonable interpretation if you consider it for a moment, because almost everything would kill an infant of tender years.

The Judge: There is no Act of Parliament against selling oatmeal to make pap for a child.

Mr. Bonsey: No; but if you gave an infant a teaspoonful of port wine you would probably kill it.

The Judge: If a child has gin sold it over the counter of a public-house, I am not sure that it would not be a punishable offence. The Act says if anybody sells or compounds a preparation of opium he is liable.

Mr. Bonsey: That has not been decided by Piper's case. That was exactly the point left open, and it was raised in the case of Delve. We were anxious there to have that very point decided which was left open. In that case the quantity was not defined, and the court said that you must have a defined quantity. In the chlorodyne case there was two grains of morphine to the fluid ounce, and there was ample evidence by the doctors that there was enough in that fluid ounce to kill several people. If the question is whether the substance sold is a poison in itself, then, of course, in the chlorodyne case it was a poison, and there is no use arguing that it was not. The only thing one could argue was that the Act did not apply, and Mr. Justice Lawrance said he doubted whether the Legislature intended it to apply to anything but a poison in its simple state.

The Judge: That case did decide that chlorodyne was not a poison in its simple state.

Mr. Bonsey: Chlorodyne is not a scheduled poison.

The Judge: But it is something which contains a preparation of opium.

Mr. Bonsey: It is the name of a compound which contains a preparation of opium. It was said that it contains poison in such a quantity that the thing sold is poison.

The Judge: How can I, after the evidence of Dr. Luff, say that this thing is not a poison? He said it was, and that it would kill an infant. Surely these quack medicines are more bought for children than for grown people.

Mr. Bonsey: If there is any danger it is more to adult people; children do not go for these things. Why did not the court decide so in Delve's case?

The Judge: There was no such evidence before the court in that case.

Mr. Bonsey: The court said there was not evidence of a sufficient quantity.

The Judge: The County Court judge did not decide it was poison, because there was no evidence that there was enough to kill an adult, and the Court of Appeal refused to upset that because upon questions of fact the judge of first instance is almost master.

Mr. Bonsey: If it is correct to say that, all you have got to do is to show, as my friend contends, that the substance contains, in some quantity, a poison scheduled in the Act, that was found in the case; but the court said no, and the County Court judge said no, there is no evidence of a sufficient quantity before me to show that it is a poison. If my friend's contention is right, and if the question of quantity has nothing to do with it, then the County Court judge was wrong, and the Divisional Court would have held that he was wrong, because there was evidence that there must have been more than a trace, as the analyst said. Therefore, that position cannot now be maintained by my friend's clients. It is not enough for them merely to show, as they have all along contended that it was, that the compound contains as one of the ingredients something that is a poison. In the chlorodyne case I submit the fair interpretation of the judgment is this, that the Act may apply where one of the ingredients is a poison, that it cannot apply in all cases where you show that one of the ingredients is a poison, but it can apply where the thing in its entirety is a poison. In that case there was such strong evidence that if a person had taken the thing sold in its entirety, he would have fallen down dead in a few seconds. Therefore it was of course a poisonous thing. That is a long way from saying that any rule has been laid down to cover all those cases that may arise. If this thing sold is a medicine and not a poison, and that is really my point, no offence has been committed, and the quantities are within the quantities prescribed by the British Pharmacopœia for doses of medicine to be made up in which morphine is one of the ingredients. It would be perfectly absurd to suggest that if a drug or a medicine is within the limits contained in the dose in the British Pharmacopœia that that is a poison. It may be that it is a poison if given to an infant, just as a glass of port wine may be a poison, or a piece of meat may be a poison to a child under certain circumstances. It is perfectly true that the doctor is guided by his experience between the minimum and the maximum, in the prescription which he may make up; nevertheless the maximum in the British Pharmacopœia is within the bounds of safety. A reasonable interpretation must be given to this Act of Parliament as to every other, and, therefore, I say that where you have a thing sold which, as a matter of fact, although it contains a poison, contains no more than might be given in a dose of medicine under the British Pharmacopœia, it is not a poisonous thing in its entirety. I admit it may poison a person in delicate health, or a person who has some particular disease which makes him sensitive to this particular drug. On the other hand, it may do a great deal of good, and, therefore, you cannot lay down a rule for people who may suffer from all sorts and all kinds of diseases.

The Judge: The Act says you shall not sell it at all unless you are properly qualified.

Mr. Bonsey: It is a question whether the thing sold contains a poison. I do submit to your Honour that Piper's case has not decided, and cannot by any strained interpretation be held to have decided, that every compound containing a poison is in itself a poison; and, therefore, it is a question of quantity, and there is not a doctor who has not said that whether the article is a poison does depend on the quantity. It is not a good definition of poison, but the difficulty is to find a good definition. When I come to cross-examine Dr. Luff, he says it does depend upon the quantity administered, and, therefore, it comes back to that. If my argument is wrong, and if Piper's case has decided that you have nothing to do but to show that one of the ingredients is a poison, then I admit that the quantity has nothing to do with it. I submit that it is most material to see what quantity of the particular thing makes it poisonous in the sense that it is fatal in its effect.

The Judge: Do you suggest that a grocer's wife in the country could sell half a grain of morphine because it is a medicine in the Pharmacopœia? Do you suggest that that would be possible?

Mr. Bonsey: In its simple state?

The Judge: Yes.

Mr. Bonsey: I do not think it would. Morphine is scheduled to the Act under the name morphine, and it says you shall not sell morphine unless you are a registered chemist and druggist, and therefore I could not argue—if it was sold in that simple state—that half a grain of morphine would not be within that Act.

The Judge: Suppose you mix it with water.

Mr. Bonsey: That would only be a colourable evasion. You do not sell the article *qua* morphia. In chemistry you may have combinations of different drugs, and the resulting substance is in the nature of neither of the component substances at all, but is an entirely different thing. It does not follow that because you sell a thing or a substance which has one of those ingredients in it that you do sell the substance in its simple state. That is the reason why I say that in selling morphine in a simple state I cannot escape from the Act, and I believe that is what the Act was intended to deal with, the sale of poisons in their simple state.

The Judge: Recollect it says retail, dispense, and compound. What would prevent a person selling opium and water and saying it is not pure opium?

Mr. Bonsey: That, I should say, would be a mere evasion. It must depend on the question of quantity. I cannot see any way out of the Act if that is not so.

The Judge: Possibly there is no way out of the Act for grocers, but you appear to be trying to find one.

Mr. Bonsey: Yes, and possibly there is, and for this reason, if the contention is right, why did not the court decide in Piper's case and in Delve's case that quantity had nothing to do with it? It would meet the case you put to me, it would meet every case, and it would clear away all these difficulties, but the courts have declined to do that. They say that is not the meaning of the Act, but that the thing itself must be regarded. Therefore, as long as that is held to be so we must in all these cases consider whether the thing itself is poisonous or not.

The Judge: I quite agree with you, that is the test. If the bottle of aniseed could not kill anybody, no man could be prosecuted, but if it could kill anybody, it would be poisonous.

Mr. Bonsey: Then we come to this, given certain circumstances of life, anything is poisonous. Things administered to people having certain diseases may have fatal effects, and if that is the interpretation to be put on the Act I do not know what would not kill a person under certain circumstances.

The Judge: The Act only specifies certain articles, the sale of which is prohibited.

Mr. Bonsey: There are a great many things that are poisonous, which find their way into articles of ordinary consumption. There are numerous things that I might mention in which the poisons mentioned in the schedule to this Act do enter. Nicotine is one which would kill anybody.

The Judge: Is nicotine administered to infants?

Mr. Bonsey; No, but it might be.

The Judge: It might be of course, but anyone who did so would find themselves in the Central Criminal Court. Delve's case had nothing to do with it, because there the man who did analyse could not say what the quantity was, and the judge said there was no evidence before him.

Mr. Bonsey: The witness said there was some.

The Judge: He said he did not take the quantity, and therefore there was no evidence on that point before the judge.

Mr. Bonsey: What was said in that case was that it was a compound of which one of the ingredients is morphine, but they did not show that it was in sufficient quantity to constitute that compound a poison. Then, I ask, with great respect, what is a poison? If I am to be told that a poison is a thing that will kill an infant of tender years, or some person in some stage of disease, then I say that is not a fair definition of poison. I say it is not a fair thing for a doctor to get into the box and say there is sufficient in this to kill an infant or a person who has some disease, therefore it is a poison within the Act. As long as this question is left open—if it is to be said in each particular case it is simply a question of fact whether a doctor by his experience, or by referring to some books, is of opinion that it may possibly kill an infant, that then it is within the Act—it is a most unsatisfactory way to leave the matter, and one which must give rise to constant litigation. It is unfortunate that the chlorodyne case did not go to the Court of Appeal; still it was not decided on the question which was raised in Delve's case, in which there was no defined quantity shown. I submit that this case is not so strong as Piper's case.

The Judge: I do not think I need hear you upon it, Mr. Grey. It seems to me that this case is absolutely covered by the case against Piper. That case was argued before me at enormous length I remember now, and it went to the Court of Appeal. It was argued upon two points: the first point was whether it was a poison or not, and all the arguments that were pressed upon me to-day were addressed to me upon the former occasion in the year 1893, and I heard it all and decided it. There it was laid down that chlorodyne—being made with enough poison in it to kill a man if taken all at once—was within the Act which precludes an unregistered person from selling poisons. There all that Mr. Justice Collins decided about the infinitesimal quantity was that he left the question open, saying: "I do not think it is necessary to lay down any rule which would cover every possible case where some infinitesimally small amount of poison enters into a larger compound. Those questions must be dealt with when they arise," as it did arise in Delve's case, which was decided by courts of competent jurisdiction—first by the County Court, and then by the Divisional Court. They decided—We have no evidence in this case of whether it is anything more than an infinitesimal quantity. In this case I have abundance of evidence, uncontradicted, because nobody has been called to say that a bottle of Powell's balsam of aniseed would not kill a man or a child, and if it would kill a child I do not think Mr. Justice Collins ever intended to say that the Act of Parliament was meant to save the lives of grown men and not children. He could not have meant that because it would only kill children it was not within the Act. That is irrational, because the history of this Act is practically that it was passed to prevent these accidental mistakes of giving children too much. Whether they are more in the habit of having these quack medicines administered to them I do not know, but clearly it was to protect people from the negligence of unregistered practitioners. If I am satisfied from the evidence that a bottle of Powell's balsam of aniseed contains enough poison to kill a child, then it is a poison within the meaning of the Act, and I cannot hold anything but that. I think it greatly to be regretted that the other case did not go to the House of Lords, because that might have settled it authoritatively. If I may venture to say so, I should approve of the judges in the Divisional Court not choosing to lay down any hard-and-fast rule. How can they? You have to deal with all ages and all constitutions, and you cannot say that a grain of nicotine, or half a grain of that, three grains of this, or two grains of something else, is within the Act, and that a less quantity is not within the Act. The Act is conclusive. It says you must not dispense, compound, or retail poisons. If that is so, and this is a poison, and it has been compounded by the owner of Powell's balsam of aniseed, and retailed by the grocer, he must be liable to the penalty.

Mr. Grey: I ask your Honour for costs on the higher scale in this case.

The Judge: No. I think the Society should be satisfied with the ordinary scale of costs.

The Registrar: With counsel.

The Judge: Yes.

Mr. Bonsey: Your Honour will give leave to appeal in this case.

The Judge: Undoubtedly.

### SALE OF POTASSIUM CYANIDE BY A DEALER IN PHOTOGRAPHIC APPLIANCES.

At the Liverpool County Court, on Thursday, February 1, before his Honour Judge Shand, the Council of the Pharmaceutical Society brought an action against F. Lloyd, who carries on business at 5, South John Street, as an optician and dealer in photographic materials and appliances, for selling poisons, contrary to the Act of 1868. Mr. T. R. Grey, of 1, Inner Temple, London, instructed by Messrs. Flux, Son, and Co., appeared for the plaintiffs, and Mr. Watkins, solicitor, represented the defendant.

Mr. Grey said the action was brought to recover a penalty of £5 for keeping open a shop for the sale of poisons, contrary to section 15 of the Act of 1868. On October 27 last a purchase was made at the defendant's shop of two ounces of a poison called cyanide of potassium, a poison which was mentioned in the schedule, and one of the most powerful poisons known to chemists, five grains being known to be a fatal dose, so that in two ounces there would be sufficient to poison ninety people. The substance purchased was handed to an analyst, who found it to be cyanide of potassium, and the object of the Act under which they were suing was to prevent the sale of poisons by persons not qualified by skill or experience to deal with such commodities. The Act made it unlawful for any person to sell or keep open a shop for the sale of poisons unless he was registered under the Act. If the name of the person did not appear on the Register, it was to be taken that the person was not registered.

Mr. Watkins said it was not claimed that the defendant was on the Register.

Mr. Grey: The Act further stated that for every such offence the person committing shall be liable to a penalty of £5. The sales of poisons in Part I. of the schedule were to be entered into a book, and particulars stated.

Terence Kelly deposed to having gone into the defendant's shop on October 27 last and purchased two ounces of cyanide of potassium, made up in the packet produced. He gave the packet to Mr. Moon.

Cross-examined.—He did not know that the shop was one for the sale of photographic materials. It was an optician's shop, with pictures in the window.

His Honour: It is "anybody who shall sell or keep open a shop," and can a photographic shop sell these poisons?

Mr. Grey: That is the sole question before your Honour.

Mr. Watkins: It is admitted that this is a photographic shop.

Witness further stated that he would not know a photographic camera if he saw one. There was no notice outside the shop as to the selling of poisons. He went to buy the poison because he was instructed to do so.

Mr. H. Moon, clerk in the office of the Pharmaceutical Society, said he received from the last witness the package, and he gave it to the analyst on January 11. Defendant dealt in photographic materials and slides.

By Mr. Watkins: He had no personal knowledge that cyanide of potassium was used in photography. The Society did not give notice before sending for the article. A letter was sent by the solicitor, claiming the penalty from persons who were not licensed or qualified to sell poisons, and many persons sent the £5 on receiving the letter.

His Honour: What was there to prevent people getting these poisons? The Society is quite right in trying to prevent such a thing.

Mr. Watkins: But these proceedings being made public only frustrate the object the Society has in view.

Mr. Moon, in reply to Mr. Watkins, said he was not aware that it was the custom of photographic people to sell these poisons. It was he, witness, who gave Kelly instructions as to the purchase.

Mr. E. J. Eastes, F.I.C., analytical chemist, deposed to having analysed a portion of the contents of the packet given to him by the last witness, and found it to be cyanide of potassium. It was one of the poisons within the schedule to the Pharmacy Act, and a very dangerous poison indeed. According to Taylor's 'Medical Jurisprudence,' five grains would be a fatal dose.

Cross-examined.—He believed cyanide of potassium was frequently used by photographers.

Mr. Frederick W. A. Lloyd, the defendant, said he was a dealer in photographic apparatus, and an optician. He had been in the business about fourteen years, and had sold cyanide of potassium all that time. It appeared in the stock lists for photographic purposes. In South John Street he had sold it to about ten persons. He only sold it to photographic people. He thought he knew Kelly by appearance, but not by name. He never saw any notice to the effect that the sale of cyanide of potassium was prohibited. It was sold at twopence per ounce.

His Honour said the defendant must convince him that he had not sold a poison within the meaning of the Act.

Mr. Watkins submitted that no notice was given by the Society before sending a lawyer's letter, and no doubt many people paid the penalty on receiving such a letter, but he thought the section of the Act was not intended at the time it was passed to meet such a case as this. It was to prevent persons carrying on a chemist's business, and employing unqualified persons.

His Honour said he did not think Mr. Watkins had anything to say in answer to the case.

Mr. Watkins: Your Honour can exercise a discretion in inflicting a penalty.

His Honour: I do not think I can.

Judgment was given for the plaintiffs for the amount claimed with costs.

### POISONING BY LAUDANUM.

An inquest was held at the Leeds Town Hall on January 31, before the city coroner, on the body of

Caroline Maria Waite, wife of Charles Edwin Waite, press printer, of St. Alban Street, Leeds, who died on the previous day. The evidence showed that on the day of her death her husband found under her pillow a bottle containing laudanum. He found another in her dress pocket, and in reply to his inquiry, she asked for some laudanum, and said she could not do without it.

Mr. Robert North Smith,* assistant to Mr. Joseph Briggs, chemist, Bridge End, Leeds, said deceased had been in the habit of purchasing laudanum from him. On Saturday she sent a servant for six ounces, and it was supplied. He formerly labelled the bottles, but had seen her remove the labels before leaving the shop.

The coroner: This appears to have been going on for some time, and yet you have done nothing to check it. It is one of the worst forms of intoxication a woman can become addicted to.

Witness: She has been so accustomed to it that I did not think it would do her any harm.

What quantity does the Pharmacy Act allow you to sell?

I really do not know.

Do not you know the provisions of the Act; you attend to this shop?

I cannot say I am thoroughly conversant with them.

Do not you know the regulations as to the sale of poisons?

I do not sell poisons, except this laudanum to Mrs. Waite?

It is a very irregular thing. I do not want to make you admit anything which might cause you to be summoned, but we must have the facts. You have supplied Mrs. Waite with this drug, and have made no inquiries whatever.

She has been such an habitual customer that I let her have it. I should not let a new customer have it.

The coroner remarked that he would have to report the facts to the authorities. He read a letter which he had received from the medical man who had been in attendance on deceased. He said death was due to pneumonia, accelerated by laudanum drinking.

The jury returned a verdict in accordance with the medical evidence.—*Yorkshire Post.*

### POISONING BY OPIUM IN TEETHING POWDER.

Dr. S. Craddock, coroner, held an inquest at the Commercial Hotel, Bristol, on January 30, on the body of Stanley Winfred, infant child of Mr. Matthew Maggs, of that town, whose death, at the age of five months, occurred on the previous Sunday.

Dr. Pollard stated that when the child was brought to him on Sunday morning at 9.45 it was in a dying condition. He saw it at 7.30 the same evening, and it died at ten o'clock. It had convulsions. The mother stated to him that she had given the baby one-half of a powder obtained from a local chemist, and she handed him the other half.

Mr. Maggs, father of deceased, gave evidence as to the purchasing of the powder. The chemist's assistant deposed to supplying a powder to Mrs. Maggs.

The coroner having reviewed the case, the jury found "That deceased died from convulsions, accentuated by the administration of a teething powder containing one quarter grain of opium, but which was not given with criminal intent."—*Bristol Mercury.*

### EXCISE PROSECUTION.

In a J.P. Court at Montrose on February 2—Provost Mitchell and Bailie Alexander on the bench—Thomas Burrell, chemist, High Street, Montrose, was charged at the instance of the Commissioners of Inland Revenue with a contravention of the 130th section of the Spirits Act, 1880, in so far as on September 10 he had on his premises three articles—tincture of opium, compound tincture of benzoin, and tincture of quillaia—capable of being used internally as medicine, in the preparation of which methylated spirit had been used. He pleaded guilty.—The justices passed sentence of a fine of one guinea for each of the three charges, or one month's imprisonment. The fine was immediately paid.—*Dundee Courier.*

## Reviews and Notices of Books.

THE LATIN GRAMMAR OF PHARMACY: for the Use of Medical and Pharmaceutical Students. With an Essay on the reading of Latin Prescriptions, and Reference Vocabulary. By JOSEPH INCE, F.C.S., F.L.S., F.G.S. Sixth Edition.*

This extremely useful and deservedly successful work presents itself once more in its now familiar guise. The major portion of the book is evidently regarded by the author as incapable of improvement, the changes, if any, being so slight up to the last section that the pagination throughout is identical with that of the fifth edition (1890), of which, indeed, the sixth is, in great measure, practically a reprint. A great improvement has been effected, however, by an extension of the reference vocabulary, constituting the final section of the book. This now occupies no less than seventy pages, and quite justifies the hope "that the Grammar may serve as a manual of reference and as a compendium of Latin Pharmacy." It is pointed out in the preface that "a carefully devised nomenclature derived from hospital practice and recent contributions to pharmacy has sprung up within the past few years to meet modern requirements," and the inclusion of this renders the Grammar of as great value to graduates in pharmacy as to junior students.

## Correspondence.

### MALAYAN ARROW POISONS.

Sir,—The determination of botanical specimens may admit of being decisive, or it may be only approximate; that is to say, it goes only as far as the material allows. The latter was the case with the determinations of the plants used in the preparation of Perak arrow poisons, made by Dr. Stapf and published in the *Kew Bulletin* for 1891, p. 267.

Mr. Holmes says in his letter published in the *Pharmaceutical Journal* for January 27 last, p. 620, that his "reasons" for Dr. Stockman's statement "that the botanical source of the Malayan arrow poisons . . . . are unknown," are given in the *Pharmaceutical Journal* for November 12, 1892, pp. 388, 389. On turning to the reference, I find copious extracts from the *Kew Bulletin*, but no reasons. On the contrary, I find the statement that "they (the specimens) approach very near to *Strychnos Wallichiana*, Hook. and Thoms." Now the geographical distribution of this species makes the identification improbable.

We do not profess at Kew to be infallible, and Mr. Holmes is quite within his rights in rejecting our identifications. But we expend some pains upon them, and we do not lightly publish our opinions without taking some trouble to arrive at accuracy. They are, therefore, entitled to some respect. I demur altogether to Mr. Holmes' method of coming down to Kew and taking the casual opinion upon our identifications of gentlemen, however distinguished, who happen to be working at other matters in the Herbarium. Mr. Clarke (who does not, by the way, assume the title of Dr.) is good enough to inform me that he considers any opinion given by him under the circumstances as worthless. Dr. King is now in India, but I apprehend that he would say much the same thing.

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* This name does not appear on the Register of Chemists and Druggists for 1894.

* London: Baillière, Tindall and Cox. Pp. i.–vii., 1 to 306. 5s.

Our determinations were only tentative, but they have a certain value as far as they go. However, I have asked Dr. Stapf to examine the specimens again. In the accompanying letter it will be seen that he adheres to his position, and there the matter must for the present rest.

*Royal Gardens, Kew.* W. T. THISELTON DYER.

### LAMPONG AND IPOH AKER.

Sir,—With regard to Mr. Holmes' recent letter in the *Pharmaceutical Journal* (*ante*, p. 620), I may remark that I have not "identified"—as would appear from his statement—the specimens sent by Mr. Wray under the names of "Lampong" and "Ipoh Aker" with *Strychnos Maingayi*, Clarke. As to the first, I queried my determination, which I should not have done if I had felt sure that the "Lampong" specimen was identical with the type of *Strychnos Maingayi*, Clarke. And as to the "Ipoh Aker," all I said was "*Strychnos* sp., closely allied to *S. Maingayi*, and probably only a different state of it." The fact was that I thought the specimens received from Mr. Wray were too imperfect to go beyond a more or less marked suggestion. I have gone over the specimens of "Lampong" and "Ipoh Aker" a second time, and I do not see any reason to give up my opinion—guarded as it is—as stated in the *Kew Bulletin* (1891, p. 267). I know too well the incompleteness of our knowledge of the genus *Strychnos* to be surprised if better specimens of "Lampong" and "Ipoh Aker" should prove that they belong to one or two new species. Mr. Holmes imputes to me also to have referred the "Prual" plant to the genera *Urophyllum* or *Lasianthus*. But I did not say more than "possibly a *Lasianthus* or *Urophyllum*." My statement was only positive inasmuch as I referred the plant to Rubiaceæ. I have examined also the "Prual" specimen a second time, with the result that I adhere more than ever to my determination. In fact, the specimen approximates, so far as it goes, so closely to *Lasianthus pauciflorus*, Wight, from Mergui, that I have very little doubt that it is a *Lasianthus*. What material Professor Radlkofer had for examination I do not know, but I wish to emphasise one point. He examined parts of some root. There is, however, no proof that this root was derived from the same plant which yielded the branch sent by Mr. Wray under the name of "Prual."

*Royal Gardens, Kew.* O. STAPF.

## Answers to Correspondents.

*Leslie G. Austen.*—You will find particulars of the substance, with full references, in the *Pharmaceutical Journal* for September 24, 1892.

"*Aconitine.*"—All subscriptions are due on January 1 in each year. It is impossible here to advise you satisfactorily in the matter you name. Everything depends upon personal aptitude and opportunities that may offer. Perhaps, too, you have not exhausted all the possibilities of pharmacy, which is not of necessity exclusively confined to shop-work.

"*Major.*"—The literal meaning of the term "Ung. Boracis" is undoubtedly borax ointment, and under the circumstances—the strength (1 in 8) being specified—you were justified in interpreting it as such.

## Notices of Meetings next Week.

### MONDAY, FEBRUARY 12.

*Imperial Institute*, at 8 p.m.
"Morocco and Algeria," by Henry Blackburn.
*London Institution*, at 5 p.m.
"Russian Political Exiles," by George Kennan.
*Society of Arts*, at 8 p.m.
"The Detection and Measurement of Inflammable Gas and Vapour in the Air" (third lecture), by Professor Frank Clowes.

### TUESDAY, FEBRUARY 13.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (fifth lecture), by Professor C. Stewart.
*Photographic Society of Great Britain*, at 8 p.m.
Annual General Meeting.

### WEDNESDAY, FEBRUARY 14.

*Pharmaceutical Society*, at 8 p.m.
"An Imperial British Pharmacopœia," by Professor Attfield.
"Laboratory Notes, with Comparative Observations on some British and United States Pharmacopœial Preparations," by E. W. Lucas.
*Junior Pharmacy Ball*, at the Portman Rooms, Baker Street, W.
*Edinburgh Chemists' Assistants' and Apprentices' Association*, at 9.15 p.m.
"Percolation," by Peter Boa.
"Tincture of Iodine," by C. F. Henry.
"Malakin," by C. F. Henry.
*Manchester Pharmaceutical Association*, at 8 p.m.
"Composition of Morphine Hydrate," by Louis Siebold.
"The Part Played by Mn. Dioxide in the Decomposition of Potassium Chlorate," by Louis Siebold.
"Note on Milk Analysis," by Louis Siebold.

### THURSDAY, FEBRUARY 15.

*Royal Institution*, at 6 p.m.
"Mountain Exploration" (second lecture), by W. M. Conway.
*Linnean Society of London*, at 8 p.m.
"On Hygroscopic Movements Connected with Seed Dispersal," by Miss Pertz.
"Contributions to the Natural History of the Flower. Part II.," by J. C. Willis.
*Chemical Society*, at 8 p.m.
Ballot for the Election of Fellows.
"Determination of the Available Mineral Plant Food in Soils," by Bernard Dyer.
"Aerial Oxidation of Turpentine and Essential Oils," by C. T. Kingzett.
*Midland Pharmaceutical Association*, at 8 p.m.
Reading of Papers at the Mason College.
*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
Members' Meeting.
*Liverpool Chemists' Association*, at 8.30 p.m.
"The Origin of Species amongst Plants," by R. C. Cowley.
"The B.P. Oleates," by Edwin Williams.
*Chemists' Assistants' Association*, at 8.30 p.m.
"The Preservation of Infusions," by Edmund White.
*Sheffield Pharmaceutical and Chemical Society*, at 8 p.m.
Musical Evening.
*London Institution*, at 6 p.m.
"On Cholera," by Dr. E. Klein.

### FRIDAY, FEBRUARY 16.

*Royal Institution*, at 9 p.m.
"Bacon's Key to Nature," by Professor Nichol.
*Quekett Microscopical Club*, at 8 p.m.
Annual Meeting. Address by the President (E. M. Nelson).

### SATURDAY, FEBRUARY 17.

*Royal Institution*, at 3 p.m.
"Light" (second lecture), by Lord Rayleigh.
*Pharmaceutical Football Club v.* Metropolitan Police, N Division, at Clapton, at 3 o'clock.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Hill, Keen, Laing, Martindale, Nichol.

# AN IMPERIAL "BRITISH PHARMACOPŒIA."

BY PROFESSOR ATTFIELD, F.R.S.*

The author has prepared the following paper entirely in his private capacity, yet with a due sense of the responsibility involved by his position as the appointed editor of the next pharmacopœia. It is written with a threefold object. First, of acquainting pharmacists and others in Great Britain, Ireland, the Colonies and India, with the nature of some proposed alterations of the pharmacopœia which have recently been considered by the General Medical Council. Secondly, with a desire to encourage pharmacists to continue to work at pharmaceutical researches bearing on the pharmacopœia by showing them (*a*) how their past researches have assisted the editors of former pharmacopœias and the editor of the Addendum of 1890; (*b*) how such researches, condensed by the annual reporter on the pharmacopœia, have been acted on and accepted by the Medical Council; and (*c*) how these and similar researches in the immediate future will maintain that conjunction of medical with pharmaceutical work which is on all sides admitted to be of benefit both to medicine and pharmacy. Thirdly, it is written to invoke the aid of medical, chemical, botanical, and pharmaceutical friends, both at home and abroad, in what must, in any case, be prolonged and arduous editorial labour. The whole paper must be regarded as treating of what is more or less tentative, and subject to the future views and action of the Medical Council and of the Pharmacopœia Committee. This much being remembered by readers, the author will not be accused of writing prematurely, but will, it is to be hoped, be credited with the simple desire to awaken interest in, and facilitate consideration of, so important a subject.

The British Pharmacopœia is produced under the Medical Acts of 1858 and 1862, the duty of providing for its compilation, and of deciding as to the necessity for, and the date of, any fresh edition, being placed by the legislature on the General Council of Medical Education and Registration of the United Kingdom. For such initiation, a medical body is, clearly, the most fit, especially when the actual compilation is carried out by pharmaceutical, in addition to medical, experts.

The current pharmacopœia is a condensation of the prior pharmacopœias of the three countries, namely, the London Pharmacopœia (1618, 1650, 1677, 1721, 1746, 1788, 1809, 1824, 1836, 1851), the Edinburgh Pharmacopœia (1699, 1722, 1736, 1756, 1774, 1792, 1803, 1807, 1809, 1813, 1817, 1839, 1841), and the Dublin Pharmacopœia (1807, 1818, 1826, 1850)—possibly others, some, perhaps, reprints—together with additions made in the resulting conjoint pharmacopœia, or British Pharmacopœia (1864, 1867, 1885, and Addendum of 1890).

Now, my conception of a true British Pharmacopœia has always been what, for convenience of description and discussion, may be termed an *Imperial* British Pharmacopœia—as useful in the remotest corner of the Queen's dominions as in the centre of London; a national medicine book of which, as of the empire, it might be said, but without boasting and as simply expressive of its silent never-ending usefulness, "the sun never sets on its might." In 1886 that conception ripened. The present pharmacopœia had been published in the autumn of 1885, and one year after the editorial duties of myself and colleagues, Professors Redwood and Bentley, had ceased, I was requested by the Pharmacopœia Committee of the Medical Council to advise the Council as to any procedure that might be desirable to secure satisfactory future revisions. The reply to this request, dated November 1, 1886, was printed and circulated amongst the members of the Council, and, it may be added, has been acted on, in its entirety, by the Council. It was two-fold, and related (*a*) to the official recognition of pharmaceutical research; (*b*) to imperial extension. It is necessary to deal with the former of these two subjects before reverting to the latter.

The first (*a*) of the two suggestions whereby the due pharmaceutical efficiency of the next British Pharmacopœia might reasonably be expected to be promoted was that, annually, there should be prepared for and presented to the Pharmacopœia Committee of the Medical Council a printed "Report on the Progress of Pharmacy in its Relation to the Future Revision of the British Pharmacopœia of 1885;" that is to say, a report on any and every original research, or published experiment, or suggestion, relating to any one of the thousand or so articles, or sections, or monographs, of the pharmacopœia (the number is now—1894—1003, if the articles of the Appendix and the Addendum be included), or on the arrangement or classification of the contents of the volume, or on its nomenclature, systems of weights and measures, and so on; the report to include the reporter's own views, and his comments on suggested omissions, additions, or alterations. The writer had the honour of being appointed the Reporter, and his seven annual reports have been accepted and printed by the Medical Council from year to year. The first, for 1886, covered rather more than one year, namely, from the date of publication of the pharmacopœia in September, 1885, to the end of December, 1886. The eighth, for 1893, will be presented at the approaching spring meeting of the Council in May, 1894. The arrangement of the contents of the reports is alphabetical, like that of the pharmacopœia itself, hence future reference will be easy; especially if, as may be hoped, there should be added, in due time, a single general index to all the reports issued during the life of the present edition of the pharmacopœia. Each paragraph of each report has full reference to the volume and page of the weekly journal containing the original research, experiment, or suggestion. In many cases subjects have not been reported at the year's end, but when the papers upon them or the correspondence respecting them have been more or less completed. A stock of these annual reports has been retained at the offices of the Medical Council—sufficient in number for each member of future compiling committees, medical and pharmaceutical, to be supplied with an indexed, interleaved, bound set, but insufficient for any further distribution. A set, so far, is already in the library of the Pharmaceutical Society in London. A similar set, as far as published, is now presented to the library of the Society in Edinburgh. By this "reporting" plan the labours of original workers will more readily be recognised, and the duties of compilers *pro tanto* be facilitated.

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* Read at an Evening Meeting of the Pharmaceutical Society, on Wednesday, February 14.

The encouragement thus given to pharmacists to continue to make original pharmaceutical investigations is obvious. Ever since the pharmacists of the kingdom were organised into a public body, by the foundation, more than fifty years ago, of the Pharmaceutical Society of Great Britain, those members of the craft, whether pupil, assistant, or principal, who possessed the necessary powers of accurate observation, reflection, and description have, in fact, published such investigations; ranging from the humblest "note" to the most advanced "research," the outcome of personal cost and effort, or of conjoint funds and labours of societies, as read at meetings of the students' associations, assistants' associations and principals' associations in London, in Edinburgh, and in the leading provincial towns, or at the annual meetings of the British Pharmaceutical Conference; or as otherwise published. And the first British Pharmacopœia, issued in 1864, did contain more evidence than was afforded by the previous three separate pharmacopœias, of such original work by pharmacists. But it seemed, at the time, that the next revision of that book might still better represent the advancement made in pharmaceutical research since the Pharmaceutical Society had been established, and since the previous Edinburgh Pharmacopœia had been issued; and still better reflect the increased activity of original workers during the then recent years of the Society's life—the thirteen years since the previous Dublin and London Pharmacopœias had been issued. The writer, therefore, in 1864, as one of the professorial staff of the Pharmaceutical Society, delivered two lectures before the Society "On the Relation of the British Pharmacopœia to Pharmacology." His colleague, Professor Redwood, also gave two similar lectures, "On the Chemical and Galenical Processes and Preparations;" and his colleague, Professor Bentley, two "On the Organic Materia Medica of the Pharmacopœia." The six lectures, all delivered by request of the Council of the Society, were reported verbatim, and will be found in the *Pharmaceutical Journal*, 2nd ser., vol. v., pp. 406, 416, 464, 479, 561, 628, and in volume vi., p. 7. In due time the Medical Council ordered a new British Pharmacopœia to be prepared "under the direction of a Committee," of which Sir Richard Quain, who had recently joined the Council, was Honorary Secretary, and "by Professor Redwood, of the Pharmaceutical Society, and Mr. Warington, of Apothecaries' Hall." This second edition of the pharmacopœia was issued in 1867, the preface stating, in reference to the first edition, which had successfully fused the three Pharmacopœias of London, Edinburgh, and Dublin into one, "the important work of amalgamation having been effected, and national differences reconciled, in some cases at the cost of mutual concession, it has been thought desirable, in preparing a new edition, to submit the work to a general revision, with the view of removing any defects that might be discovered, and of supplying ascertained deficiencies." The result was satisfactory. Sir Richard Quain threw himself into the task of general direction with characteristic energy, which has increased in effect as he advanced from the secretaryship to the chairmanship of the Pharmacopœia Committee and, now, to the presidentship of the Council. The labours of original pharmaceutical observers and investigators were appreciated and utilised. The same statement may be made, the writer ventures to hope, as regards the third edition of the pharmacopœia, issued eighteen years afterwards, in 1885, in the production of which, Mr. Warington having died, Professor Redwood's two colleagues—namely, Professor Bentley and myself—were editorially conjoined. No worthy pharmaceutical investigation, great or small, was knowingly omitted from consideration in the compilation of the 1885 Pharmacopœia. That work was, as I stated when defending it in December, 1885, against certain critics whom I regarded, rightly or wrongly, as somewhat unwisely hostile (*Pharmaceutical Journal*, 3rd ser., vol. xvi., pp. 465 to 472), as regards its pharmacy, "the pharmacists' own pharmacopœia," and, further, in reference to the galenical formulæ as a whole, that the bulk "is already largely constructed by pharmacists; it is they who have supplied the chief pharmaceutical materials of the edifice, their own pharmaceutical experts being employed to put those and other materials together."

But the free and full recognition of pharmaceutical research by the Medical Council is still more obvious in the 1890 Addendum to the present pharmacopœia. The labours of pharmacists at original investigation had become very important. It was only necessary, with the ever ready aid of Sir Richard Quain, to draw the attention of the Pharmacopœia Committee of the Medical Council to those labours, for a request to be sent to the Council of the Pharmaceutical Society for pharmaceutical help in the compilation of the Addendum. (See *Pharmaceutical Journal*, 3rd ser., vol. 20, pp. 454 and 1009.) The result is seen on page 7 of the Addendum, where appear not only the names of the members of the Pharmacopœia Committee of the Medical Council, but also those of a Pharmaceutical Pharmacopœia Committee, who were responsible to the former committee for the production of the practical pharmacy of the Addendum. Here stands evidence before all the world, not alone of the union of medicine with pharmacy, for that already existed, but of the liberal recognition of that union by the Medical Council, recognition desired by the leading speakers and workers of the Pharmaceutical Society for fifty years, and a fitting inaugural event for its Jubilee. The writer's pride will be pardoned, even though his modesty be questioned, if he here reproduce two paragraphs from the Report of the Pharmacopœia Committee adopted by the Medical Council on November 29, 1890:—"The Committee recommends that the best thanks of the Medical Council be presented to the Council of the Pharmaceutical Society of Great Britain for the valuable assistance rendered." "The Committee view with satisfaction this conjunction of medical and pharmaceutical work in the production of the present extension of the Pharmacopœia, a combination that cannot but be productive of future, as well as immediate, benefit both to medicine and to pharmacy. To the Annual Reporter on the Pharmacopœia to the Medical Council, Professor Attfield, must be accorded the credit of initiating and organising this desirable union." (*Pharmaceutical Journal*, 3rd ser., vol. xxi., p. 525). That Reporter is, of course, gratified at his success, but what he desires to emphasise just now is that the union was really the result of pharmacists' prosecution of pharmaceutical research.

The forecast of future benefit was soon justified—namely, three years afterwards. For within the past few months, on December 4, 1893, the Medical Council adopted the recommendation to invite the Pharmaceutical Society to help in the compilation, not of a comparatively small Addendum, but of a new edition of the British Pharmacopœia. This very flattering invitation coming direct from the Medical Council, it follows that the Medical Compiling Committee which will, with the help of the medical authorities and their medical experts throughout the kingdom, decide on what additions they would recommend to be made to the present pharmacopœia, and the Pharmaceutical Compiling Committee which will, *inter se* and with other expert aid, decide on the best formulæ, etc., for the additions, will be on that satisfactory footing that apparently leaves little or nothing to be desired in the interests of medical practitioners, pharmacists, and the public. Pharmacists are governed by the pharmacopœia; they will now, as a result of their pharmaceutical research work, and through their pharmaceutical representatives, have a voice in its pharmaceutical construction. Here then is encouragement to pharmacists to continue to work at pharmaceutical investigation, encouragement ample and liberal, and coming from the highest constituted authority.

To revert now to the question of extending the area of usefulness of our great "Book of Medicines."

The opportunity of again considering the idea of possibly extending the usefulness of the pharmacopœia was afforded by a communication which came before the Medical Council at the meeting on May 28, 1892, from the Government of India, in effect recommending the omission, in due time, of the almost useless and very expensive saffron from the pharmacopœia, and the substitution, in India, of an indigenous oil for olive oil in the preparation of ointments, plasters, and liniments. The Surgeon-General with the Government of India thought "that this principle of excluding useless and expensive ingredients might be carried further and extended to the general drug list, as he considered, for example, that oil of lavender in camphor liniment, and oil of cajuput in croton liniment were useless and costly additions."

The second (*b*) of the writer's two suggestions of November 1, 1886, to the Medical Council respecting the procedure necessary for promoting the increased efficiency of the next British Pharmacopœia, namely, that of imperial extension, was, therefore, once more brought before the Pharmacopœia Committee, on May 25, 1893, in the following terms, again raising the question in the words of the letter of 1886:—"The question as to whether or not any changes—and, if any, what changes—can be effected in a future British Pharmacopœia to better adapt it to Colonial requirements, or, in other words, the requirements of all the more distant parts of the British Empire." Towards that object the Council passed the following resolution:—"That the Pharmacopœia Committee be authorised to enter into correspondence, through the Privy Council, with the India Office and the Colonial Office, with a view to ascertaining in what degree, if any, the British Pharmacopœia can be better fitted than at present to meet Indian and Colonial requirements as regards important natural drugs and pharmaceutical preparations." In the following October letters were written to the Privy Council by the President of the Medical Council. These have been published in the *Pharmaceutical Journal*, vol. liii., pp. 470-472. A very large number of copies of the letters were distributed in November last by the India Office and the Colonial Office, for use by the medical and pharmaceutical authorities in India and the Colonies. This action was regarded by the Council as the first step towards the issue of another British Pharmacopœia—whenever that may be, in view of the time that must be occupied by the many and repeated communications with even the most distant parts of the empire. In short, the Council formally ordered the preparation of the work, and did the writer the honour of appointing him editor.

That much, and that much only, has been settled. Whatever is said or done by medical practitioners or by pharmacists, at home or abroad, as the outcome of what is stated in this paper respecting the next edition of the British Pharmacopœia, must be regarded as tentative and subject to the future views and action of the Medical Council, as stated already. So far as action has gone at present we may perhaps interpret the attitude of the Council in this matter towards the Colonies and India, to be, not one of desire to produce an Imperial Pharmacopœia, and of request for aid in carrying out such a desire, but rather of willingness to make the British Pharmacopœia more useful than at present, both broadly and in all details, if it is not already sufficiently useful, whether in India or in any one of our Colonies. The Medical Council has already stated, in the two letters referred to, that all suggestions shall receive the best and fullest consideration. They may be sent to the offices of the Council, addressed to the Registrar, 299, Oxford Street, London, W.

As to the form which proposed Colonial and Indian additions, alterations, or omissions might take, the Medical Council has directed as follows: "Each suggestion should be as detailed as possible, and each list of suggestions as complete as possible." It may be risky to venture on advice to distant friends, but, for example, if the insertion of a new natural raw drug or article of materia medica is desired by medical practitioners, a paragraph respecting it might be drawn up in the general form of similar existing paragraphs in the pharmacopœia, and then might follow facts and reasons in support of the suggestion. Any desired pharmaceutical preparations of the drug might then be mentioned. Formulæ for the preparations of the said drug would be drawn up by persons having adequate pharmaceutical knowledge, and be in a form to fit them for insertion amongst the similar existing official formulæ for extracts, liniments, ointments, pills, tinctures, etc., pharmaceutical facts and reasons for insertion then following. New definite chemical substances might have similar literary treatment. Proposed new preparations of old vegetable or mineral articles of the materia medica might be similarly presented for consideration. Adjustments of strength or potency of existing preparations will not be difficult in a pharmacopœia which is already largely an amalgamation of three pharmacopœias, but there must be reasonable concession when important percentage alterations are suggested, and reasonable respect for the *status quo*. Similar remarks apply to the omission of any existing ingredient of a formula or the inclusion of a new ingredient. The total omission of a drug from the present pharmacopœia will not be suggested without the most careful consideration by the medical authorities making the suggestion. Opinions on matters having broader bearings than the foregoing probably will be welcomed, but will necessarily merge into subjects to be discussed in their general imperial relationships rather than from a local standpoint.

To turn now to the discussion of the character of the next British Pharmacopœia in its home editorial aspects, a discussion which it is intended that this paper shall initiate; all views, it may be stated once more, of course being subject absolutely to the controlling voice of the Medical Council and the Pharmacopœia Committee.

Clearly it would be unwise to alter the nomenclature of the present pharmacopœia in any important respect. In the recently issued Pharmacopœia of the United States, the Latin nomenclature of the previous edition is retained, while there is a half-and-half alteration of the English nomenclature. For instance, *Magnesii Sulphas* and *Tinctura Opii* appear in that old dress which, let us hope, they will long retain. While, however, under the leading title *Tinctura Opii* there appears the leading English title *Tincture of Opium*, which also is a translation, under the leading Latin title *Magnesii Sulphas*, there appears, not the translation of those words, namely, *Sulphate of Magnesium*, but, in a single line in type of Egyptian blackness, *Magnesium Sulphate*, and so on with the whole of the galenical and the chemical nomenclature. Here is a sacrifice of the advantages of translation and of literary elegance to mere "up-to-date" chemistry and its will-o'-the-wisp nomenclature. Scientific chemists claim the right to alter their views of the chemical constitution of matter as often as may be desirable; to substitute one crutch, or rather hat-peg, of hypothesis or theory for another whenever the advancing strides of their science may render such a course expedient; to change notation in accordance with their views wherever the conjoint wisdom of the followers of chemistry erects a guide-post, and to give new consistent names to formulæ. But the pharmacist and the medical practitioner, and the writer as a professed, if anxious, guide of both, should place in the front rank of the qualifications for a name, not supposed constitution, which is here to-day and gone to-morrow, but permanence —a name which shall, if possible, be unambiguous, contain no numeral syllables, be recognised throughout the empire, and possess the very minimum of instability. Chemistry is unfortunately splitting off from pharmacy. Chemists have arisen other than chemists and druggists, and "chemists and druggists" are growing up who are not the former or scientific "chemists," but "pharmacists" alone. Better, perhaps, accept what appears to be the inevitable and be content with the name "pharmacist," but therewith let us take as our motto, "Pharmacy for the Pharmacist." Pharmacists should have their own nomenclature, which, while not inharmonious with the frequently changing nomenclature of chemistry, shall have the prime virtue of all possible permanence. Few British medical practitioners or pharmacists will sympathise with this recent action of the compilers of the otherwise highly-improved Pharmacopœia of the United States. Let us trust that we shall retain in our next British Pharmacopœia both the Latin and English leading chemical names of the present edition as a rule, with perhaps no so-called indeclinable substantives.

The writer's views respecting official synonyms, more especially those which tend to remove difficulties and uncertainties respecting the composition of what may be termed household remedies, have been set forth in the pharmaceutical press, and so far have been strongly supported. The Pharmaceutical Pharmacopœia Committee may be trusted to give a practical outcome to the matter. The subject is wide in itself and in its bearings, but is, perhaps, fairly focussed in the reports for 1887, 1888, 1889, and 1890.

Respecting official weights and measures, pharmacists would much help by discussing the question of the substitution of grains by measure—that is, "fluid-grains" or "grain-measures" for minims. We use ounces (ozs.) and fluid ounces (fl. ozs.); why not grains (grs.) and fluid grains (fl. grs.), the minim gradually, in the course of years, dropping out of use? Viewed in the light of variation in doses, the subject has not apparently much therapeutical importance, and its legal bearings are not insuperable; but its pharmaceutical importance is considerable in relation to the question of accuracy in compounding solutions and in dispensing, and as promoting simplicity of relationship of weights to measures. In the 'Year-Book of Pharmacy,' 1889, p. 498, will be found a series of formulæ for official *liquores*, in which 1 part by weight of active principle is contained in 100 similar parts by measure —for example, 1 ounce of arsenic in 100 fluid ounces of solution, or 1 grain in 100 fluid grains. In the technical language of pharmacy these are true "1 per cent. solutions" because of the implied practice, which never need be abandoned—namely, "solids by weight, liquids by measure." Where the words "one per cent." are not qualified by something expressed, something understood, or an implied practice, then, of course, the words "one" and "per cent." must, by the ordinary laws of language and logic, apply to the same thing or condition, and not to dissimilar things or conditions. A solution containing 1 grain in 100 minims is scarcely an equally technically true one per cent. solution, and certainly not an equally simple technical one per cent. solution. An editor must not himself argue for the abolition of the minim.

But a still more important question relating to official weights and measures is the growing demands on our attention of the metric decimal system. This is now practically the sole system in the United States Pharmacopœia. Our colonists in Canada must largely use that pharmacopœia; and it may be expedient to give them official formulæ on the metric system. We must, of course, assume that the medical practitioners and pharmacists of the old country, at least, would not at present accept a pharmacopœia on the metric system alone. Cannot those monographs of our current pharmacopœia which include weights and measures on the imperial system, be followed in every case by formulæ on the metric system? Sometimes it will only be necessary to repeat the lines containing the quantities, the directions applying to either system; sometimes the directions will admit of adaptation to either system; sometimes the paragraphs of directions in terms of the imperial system will also have to be repeated in terms of the metric system. The book need not be increased materially in size by such an extension of matter, for the "spacing," at least, might be less liberal than at present. It is not at present desirable further to enter on this question, for it should first be discussed in the Colonies and India.

Colonial and Indian *additions* to the pharmacopœia have been mentioned. Considering the activity exhibited in the search for, and in the making public of, new drugs during the past twenty years, additions of many really new drugs cannot be expected. The question of home additions is important for medical consideration, but is one on which pharmacists may be able to supply some information to medical authorities in regard to the frequency or infrequency with which the more firmly established "new remedies" are prescribed. Here attention may be drawn to the following paragraph in the preface of the new Pharmacopœia of the United States:—"In accordance with the positive instructions of the Convention, those of the new synthetic remedies which cannot be produced otherwise than under patented processes, or which are protected by proprietary rights, were not admitted into the pharmacopœia."

It would be outside the scope of this paper to touch on the questions of botanical nomenclature; general mechanical processes; how far the pharmacopœia may be made more or less an undergraduate's book than at present, that is to say, whether or not, for example, explanations of tests should be included, and whether or not most of the descriptive sentences at the commencement of the sections or monographs should be excluded; nor to consider any general rules relating to the limits of demand of purity of articles.

Still less can now be considered the details respecting any one monograph of the pharmacopœia.

The younger workers at original pharmaceutical investigation will not accuse the writer of merging editor in professor, nor the older of merging editor in reporter, if he ventures to beg them to continue to experiment—experiment—experiment. There is dignity as well as definiteness in the words "pharmaceutical research;" and it is on accurate pharmaceutical research, properly so-called, from a simple observation to an elaborate investigation, far more than on strictly chemical, physical, or botanical research, that the position which pharmacists have won for themselves in the production of the pharmaceutical portion of our pharmacopœia can be maintained; it is on published accurate pharmaceutical research, in the main, that the pharmaceutical basis of future Imperial British Pharmacopœias can be constructed satisfactorily.

[*The discussion on this paper is printed on p.* 673.]

# LABORATORY NOTES.

## WITH COMPARATIVE OBSERVATIONS ON SOME BRITISH AND UNITED STATES PHARMACOPŒIAL PREPARATIONS.*

BY E. W. LUCAS,

*Pharmaceutical Chemist.*

I propose to commence my paper by suggesting a few additional tests and descriptions that I think might be usefully included in the next British Pharmacopœia, and then go on to compare the more important articles that have been included in the new U.S. Pharmacopœia with the corresponding ones that have been official in our own for a considerable period.

*Aloes.*—No chemical test is official for distinguishing between the two varieties of aloes. Cold nitric acid produces a fugitive red colour when added to powdered Barbados aloes, while Socotrine aloes, when so treated, gives no coloration until warmed, when it turns reddish brown. Also—it might be added—the surface of hepatic aloes is invariably covered with minute wrinkles, and the odour of either variety becomes much more marked if gently breathed upon.

*Balsam of Tolu* is occasionally mixed with common turpentine, but its presence may be readily demonstrated if, after adding strong sulphuric acid to the suspected sample, sulphur dioxide is given off, accompanied by blackening—whereas pure balsam only turns cherry red.

*Buchu.*—Although it is mentioned that buchu leaves are marked on their margins with oil glands, yet stress might be laid on the fact that one gland is situated on each serrature, and especially one at the apex. *Empleurum serrulatum*, which somewhat resembles *Barosma serratifolia*, has no gland at the actual apex.

*Catechu and Scammony.*—The percentage of ash yielded by these substances is not specified. Catechu is required to be entirely soluble in boiling water. This it rarely, if ever is, a more or less turbid mixture being generally produced. Some impurity is invariably present, and it would be well to limit the ash to 6 per cent., as is now done by the German Pharmacopœia. Scammony is notoriously adulterated, even the prefix "virgin" is not always a guarantee of its purity, and the limit of ash would be an additional safeguard, 3 per cent. being looked upon as the maximum.

*Poppy Capsules.*—When poppy capsules are used for extract and for syrup they are directed to be freed from the seeds. Should not this direction be extended to the decoction? As it stands the capsules are ordered to be bruised, which implies that the seeds are to be used as well. It is, I know, urged by some that a little of the oil is removed from the seeds and remains suspended in the mucilaginous liquid. This may be so to a small extent, but I think it must be a very small one, and it seems doubtful if any special therapeutic value can be accredited to it. Moreover, poppy capsules are so often broken in storage and transit that most of the seeds escape, and frequently the decoction is prepared with anything but the fair percentage that belong to a capsule.

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* Read at an Evening Meeting of the Pharmaceutical Society, on Wednesday, February 14.

*Digitalis.*—Everyone knows the difficulty experienced at times in distinguishing broken specimens of dried leaves. Digitalis, for instance, is common in certain parts of the country, and many pharmacists no doubt have the leaves collected and dried under their own supervision. This is as it should be, but unfortunately it cannot always be done; and then one has to fall back on dried material, obtained as a rule in a more or less broken and crumpled condition. Under such circumstances, a detailed acquaintance with the leaf is desirable, and it might usefully be noted that in foxglove leaves the veins run well down into the petiole, thus distinguishing them at once from numerous possible substitutes, including the not uncommon one of *Inula Conyza.*

*Plasters.*—In several of the official plasters curd soap has been substituted for hard soap, and I have to strongly advocate a return to the latter. According to Dr. Paul, powdered curd soap contains from twice to three times as much water as most other soaps, and whether it is due to this fact or not, certain plasters made with it are not as easy to roll into sticks as they were formerly. Emplastrum plumbi and emplastrum resinæ are notable examples of this alteration for the worse. I also have to suggest the addition of a little rubber to the principal bases, to counteract the tendency to crack when kept spread. A process involving little trouble is to dissolve the rubber in chloroform and anhydrous wool-fat, in a wide-mouthed bottle, fitted with a long upright condenser, applying just sufficient heat to keep the mixture gently boiling: one part of rubber and two parts of wool-fat are good proportions. The semi-fluid mixture should not be added to the other ingredients until nearly cool, when if well stirred, the chloroform is soon dissipated. A little extra care has perhaps to be taken in the manipulation, as if a heat much exceeding 200° F. is used to melt the plaster, the rubber has a slight tendency to come out in lumps. This, however, is no disadvantage, as every practical plaster spreader is much too wise to use a greater heat than that afforded by a water-bath. I have here emp. ferri and emp. picis, to which only half per cent. rubber and one of wool-fat were added, and yet they are at this length of time still sufficiently pliable to admit of being rolled up and sent out in a cylindrical case without cracking, an operation to which few, if any, pharmacopœial plasters would submit to half an hour after solidification had taken place. Rubber is now so extensively employed by large plaster spreaders that no serious objection is likely to be lodged against its introduction, particularly as the quantity would be so small.

*Extracts.*—The solid extracts are mostly ordered to be evaporated to a suitable consistence for forming pills, or else to the consistence of a soft extract. This leaves a good deal to the discretion of the operator. If an extract is to be really of a consistence for pill making it must be hard indeed; as a fact, very few extracts could be made into pills without the aid of some addition, and they are very rarely so prescribed. Would it not be better to order all the solid extracts to be evaporated to a soft consistence, say that of fresh honey, for it is obvious that both requirements cannot be complied with. With regard to those intended for pill making, it has been my own experience that the official ones are better evaporated fairly low down, and whilst still warm sufficient finely sifted althea or sugar of milk stirred in, to bring the whole up to pilular consistence when cold. An ordinary extract requires about 10 per cent. of moisture to be driven off, and replaced with an equivalent quantity of some inert powder to effect this. There are however three—the extracts of colocynth, rhubarb, and cascara—which even if treated as described are a constant source of trouble to the dispenser. These, it is suggested, should be evaporated at a proper temperature to dryness, and either be brought up to weight or kept as "species," the equivalent of which is to be used instead of the soft extract.

*Extracts of Nux Vomica and Opium.*—These are both adjusted to definite strengths, the finished product varying considerably in consistence, which alters still further on prolonged keeping. This renders the standardising abortive, and it is suggested that these two also should be evaporated to complete dryness, and adjusted with sugar of milk.

*Extract. Belæ Liquidum* already contains about 20 per cent. of rectified spirit, but it is insufficient to prevent the tendency to decomposition during very warm weather. In hot climates it is a common practice to add a little chloroform or salicylic acid to preparations whose keeping properties are not of the best, but I doubt if such a procedure is admissible in England, although on some of our summer days the thermometer may register an almost tropical temperature.

*Extract. Cinchonæ Liquidum.*—Our present process for this liquid extract is undoubtedly a vast improvement over the old method of exhaustion with distilled water, but even now the alkaloids are only partially removed, and serious loss, with consequent increase in the cost of production, is the result. After several trials I have found that the best results are obtained by percolating at an elevated temperature. The apparatus employed is simply an ordinary percolator provided with a hot water jacket, and can easily be fitted up in any laboratory. The coarsely powdered drug is moistened and packed in the percolator, the hot menstruum being poured on until the liquid begins to drop, when the orifice is closed and the whole allowed to macerate at a temperature of about 150° F. for twenty-four hours, when percolation is allowed to proceed (still maintaining the temperature) until solution of soda ceases to cause a precipitate with the droppings. The percolate is afterwards evaporated on a water bath and standardised in the usual way. Working on small quantities I have found that each pound of bark requires about four pounds of the B.P. menstruum for exhaustion, although operating on a large scale this quantity could probably be reduced. The comparative value of the two processes will be seen by the following:—Two pounds of powdered red cinchona bark, practically containing five per cent. of total alkaloids, was divided into two equal portions. One half was exhausted by hot percolation, the second by the B.P. process. In the first instance the standardised product was as nearly as possible sixteen ounces, in the second only a little over thirteen ounces, although it had been percolated by the full amount of liquid ordered, followed by an additional four or five pints of water. These facts appear to indicate a temperature of about 150° F. as the most suitable for complete extraction, with a reduction in the volume of menstruum and consequent shortening in the time of evaporation and exposure.

*Liquorice Root (Dried).*—This may be used in either the peeled or unpeeled condition. Would it not be well to insist on its being peeled, as if the cortical portion which contains an acrid principle is included, the sweetness is somewhat impaired?

*Rhamnus Frangula* bark is ordered to be kept for at least one year before being used. Should not this direction be extended to cascara sagrada? It has been stated that extract made from seasoned bark is not only less bitter, but is less liable to disagree with the patient.

*Glycerin of Starch* was, I believe, introduced by Mr. Schacht some thirty years ago under the name of "Plasma." His original formula, which was practically adopted by the 1867 pharmacopœia, produced a fairly stiff translucent jelly, but now that one-third of water is substituted for an equal volume of glycerin, the product is too soft to answer the same purposes the old one was fitted for; moreover it has a great tendency to separate after being kept a short time. If made with glycerin alone the plasma does absorb moisture from the atmosphere, and a little water may be an advantage, but 33 per cent. appears far too much.

*Guaiacum Resin* is occasionally adulterated with pine resin. This sophistication may however be detected, if a terebinthinate odour is exhaled when thrown on burning coals, or if the precipitate caused by the addition of caustic potash solution to the tincture remains undissolved in excess of the alkali.

*Infusions.*—Bruised leaves are ordered to be used in making infusion of buchu, and the rhizome in No. 20 powder for infusion of serpentary. In the case of the first-named a mucilaginous liquid is produced, the viscosity of which at times may be so magnified as to render straining almost an impossibility; while the infusion when so made is much more liable to suffer rapid decomposition. In the case of the second, if serpentary infusion is made with bruised material, the hot water takes up an appreciable amount of starchy matter, the result being that if prescribed with tincture of iodine, as it frequently is, a turbid blue mixture is produced, owing to the fixation of the iodine, which is hardly what the prescriber intends. Under these circumstances it would appear advantageous to omit the directions for bruising either drug when ordered to be infused with boiling water.

*Rhubarb* in powder may be adulterated with turmeric, and it would be useful if a test were inserted for its detection. Perhaps as good a one as any is to add a little saturated solution of boric acid to a weak tincture of the suspected powder, when a brown coloration ensues if turmeric is present.

*Sodium Arseniate* contains more than half its weight of water of crystallisation, part of which may be lost if the salt is exposed, the effloresced salt then containing a varying proportion of water. The anhydrous salt on the other hand is stable and easy to store and weigh, and it would be a distinct gain if it could be substituted for that now official.

*Syrup of Phosphate of Iron* is peculiarly liable to change, and in spite of many attempts no form has yet been devised yielding an unalterable preparation. In the official process sulphate of iron and phosphate of sodium react on each other, forming ferrous phosphate and sulphate of sodium, the resulting free sulphuric acid, which would keep a portion of the iron in solution, being nearly neutralised with bicarbonate of soda. After washing, the precipitate is dissolved in phosphoric acid, and this solution converted into syrup, which is therefore presumed to contain acid ferrous phosphate. But during the washing the original white precipitate has turned blue from the formation of ferroso-ferric phosphate, and this oxidation continues to some extent in the syrup, notwithstanding the protective action of the sugar, thus probably accounting for the change in colour on exposure. Under such circumstances it would appear advantageous to direct a solution to be made directly from iron wire and phosphoric acid, in such proportions that, when mixed with simple syrup, one grain of phosphate should be contained in each fluid drachm. This is by no means a new idea, as it has been recommended by several very eminent pharmacists for a considerable length of time, and no doubt many chemists already manufacture their syrup thus; still it would be better if authority were given for doing this.

*Tinct. Quininæ Ammoniata*, although so useful, is perhaps the nastiest medicine in the whole pharmacopœia, combining as it does a sharp alkalinity with such intense bitterness. I wish to show you a specimen containing the full amount of quinine sulphate and solution of ammonia, partially disguised by the addition of glycerin and compound tincture of chloroform. I cannot claim that its admixture with water is any more elegant than that now official, but I think it would be much more readily taken by the fastidious. A fluid drachm forms only a slightly opalescent mixture with a wineglass of water. The suggested form is:—

| | | |
|---|---|---|
| Quinine Sulphate | grs. | 160 |
| Proof Spirit | oz. | 6 |
| Comp. Tinct. of Chloroform | „ | 2½ |
| Solution of Ammonia | „ | 2½ |
| Glycerin, to produce | „ | 20 |

Mix the quinine with the proof spirit, and add the tincture and ammonia, previously mixed together; shake and make up with glycerin to one pint. In this, as in the official form, there are nearly 8 minims of ammonia solution in each drachm. This appears somewhat large, and the mixture would be rendered much more palatable if the quantity were reduced to an ounce and a half.

*Effervescing Preparations.*—The proportions of the two acids in the effervescing preparations in the addendum require a little adjusting to secure strongly cohering granules. As now prepared, they are very apt to crumble to powder during the sifting, or even before such an advanced stage is reached. In effervescent sulphate of magnesia the citric acid should be increased to 6½ ounces, with a consequent reduction of ½ oz. of the sugar. In effervescent phosphate of soda the amounts of the acids would be better if more nearly equalised, thus:—

| | |
|---|---|
| Powd. tartaric acid | 12 oz. |
| Powd. citric acid | 10½ oz. |

*Mucilages and Injections.*—In the three mucilages, and one of the hypodermic injections distilled water is employed, the exceptions being made with camphor water, and they are all more or less prone to change if kept any length of time, even protection from light being insufficient to obviate this. Perhaps it is impossible altogether to prevent decomposition, but a vehicle might be used, possessed of such preservative power that solutions made with it would keep unimpaired for a reasonable period. Water that has been boiled with the residue left after manufacturing syrup of tolu has one of the strongest claims in this respect, and could with advantage be employed in many pharmaceutical operations. Injections of ergotin and apomorphine hydrochlorate both keep well when made with it; whilst morphine injection not only does not turn brown so rapidly, but is less liable to deposit crystals of alkaloid. Mucilage of tragacanth already keeps fairly well, but the mucilages of starch and acacia are noted for their tendency to spoil. Specimens of these preparations with tolu water a month or more old, which have been kept at varying temperatures, are here, and I think they are all in a very fair state of preservation. There is perhaps one little drawback if mucilage of acacia is made with this water, and that is, the colour is slightly deepened, but it is not too serious to prevent its adoption.

*Pills.*—In our present formulæ for pills it appears as if we are trying to combine two practically incompatible conditions, viz., a soft mass which will mix easily with other ingredients, and a pill mass of sufficient consistence to roll, which when rolled and cut ought to yield pills that will keep their shape. Three masses alone answer these conditions; most of the others are much too soft when first made, and much too hard if kept for any length of time, and the ones that do not come under either category are of such consistence as to adapt themselves with singular exactitude to the shape of the containing vessel. Such pill masses as those of aloes and iron, or aloes and asafœtida, if kept for a short time, become almost as hard as the mortar in which they were compounded, while others, as Plummer's pill, are just as unsatisfactory from never really hardening or drying at all. It would be a decided advantage, and a change that would be welcomed by most dispensers, if the official pills, with certain exceptions, were kept in powdered "species," say four grains to equal five grains of mass, the excipient being left to the discretion of the prescriber or dispenser. The exceptions are the pills of iron, iodide of iron, mercury, and phosphorus, none of which would lend themselves to such alteration if it were desirable. I may perhaps be allowed to suggest the omission in the next edition of the synonym for pil. saponis co., for if one is to judge by recent correspondence that has appeared in our journals, considerable doubt may be engendered in the mind of the dispenser as to what is meant when pil. opii is ordered in a prescription.

*Ointments.*—When ung. cetacei is made without the benzoin it will not keep for more than a week or two under ordinary circumstances. If benzoated it is not entirely satisfactory, for this reason, that there are certain persons who cannot apply benzoic acid to the skin without its causing more or less irritation. This may be due to idiosyncrasy, but nevertheless it is the case, and only on the morning before I wrote this a case came under my notice in which much pain and smarting had been experienced after its application to the eyelids. Here it is proposed to make use of oil of theobroma. The following proportions yield an ointment almost indistinguishable from the official one, and probably much blander in operation, whilst the preservative properties of cocoa butter are almost as marked as those attributed to benzoin:—

| | |
|---|---|
| Spermaceti | 4 |
| White wax | 2 |
| Almond oil | 18 |
| Oil of Theobroma | 6 |

*Filtration Methods.*—Anyone who has had to manufacture simple elixir and such like preparations knows the difficulty there is in obtaining perfectly bright solutions of the essential oil in water. The use of calcium phosphate, as suggested by the U. S. Pharmacopœia, partially gets over the difficulty, but if acid liquids are under operation an inert powder must be substituted. Recourse must then be had to kaolin, as directed by the B.P.C. Formulary. But a new difficulty arises from the extremely fine state of division in which kaolin exists; in suspension it can only be removed by filtering through a layer of itself, and the constant turning back of the filtrate to secure this involves a great deal of time and trouble. To obviate these disadvantages I have to propose the use of a mixture of powdered paper, asbestos, and kaolin, in some such proportions as the following:—

| | |
|---|---|
| Paper powder (obtained by rubbing dried white filter paper through a 20-hole sieve) | 1 oz. |
| Asbestos (sifted) | 1 oz. |
| Kaolin | 10 ozs. |

Mix lightly together, finally sifting. The powder should be shaken up with the turbid liquid for a few minutes and poured on to the previously wetted filter, the filtrate being returned until it passes through bright, which it does in a short time. Using this admixture, the filtering of such refractory liquids as acid. glycerole of pepsin is rendered effectual and expeditious, while turbid solutions of essential oils in distilled water, etc., are very readily dealt with.

## PART II.

I will now make a few comments on the recent edition of the U. S. Pharmacopœia, glancing at some of the more important alterations and additions, and comparing them with our own standard.

*Assay Processes* have been included for three drugs and their preparations, viz., cinchona, nux vomica, and opium. The gravimetric method of determination has been replaced as far as possible by the volumetric method, thus rendering the examination of chemical solutions more simple and expeditious. In most cases, definite weights for solids and measures for liquids in terms of the metric system have been employed. In certain cases, where weighing is decidedly more convenient, or when the product is adjusted to a percentage by weight, which would be rendered uncertain if the ingredients were taken by measure, liquids are ordered to be weighed. In some cases, however, the quantities are directed by volume.

*Glycerin* appears to be more extensively used, entering into the preparation of ten tinctures and nineteen extracts. When solid extracts are required to be preserved in a plastic condition, permission is given to incorporate 10 per cent. of glycerin while still warm, a corresponding amount of moisture being driven off. Wool-fat is now introduced containing not more than 30 per cent. of water, but the anhydrous base is not official. Diluted waters of orange flowers and rose have been added, and they are directed to be made by mixing water saturated with the volatile oil of the fresh flowers with an equal bulk of distilled water. In the B.P. rose water is made by distilling a specified quantity of the petals with water to produce a definite bulk, while orange flower water is only referred to as a commercial product.

*Effervescing Preparations.*—Three of these now find places—granular effervescing citrate of caffeine, and effervescing citrates of lithia and of potash. A new process is adopted for the first, the ingredients in fine powder being made into a paste with alcohol and rubbed through a six-hole sieve. It is then directed to be dried and reduced to a granular powder. The last two are not granulated. Citrate of lithia is simply an effervescing powder made by drying and mixing the ingredients in the usual way, whilst in citrate of potash the citric acid and bicarbonate of potash are rubbed in a hot mortar to promote combination, and the resulting paste dried at a temperature of 280° F., and reduced to powder when perfectly dry.

*Pepsin* has evidently received a good deal of attention, and the description is sufficiently wide to include almost any manufactured article, provided it complies with the strength. It is described as a proteolytic ferment or enzyme obtained from the glandular layer of fresh pigs' stomachs. It may be white, yellowish-white, pale yellow, or yellowish, either in the form of amorphous powder or scales, soluble, or only partly soluble, and either opaque or translucent. It would, as suggested by Mr. Beringer, have been more in accord with pharmacopœial exactness to have described two pepsins, one in powder, the so-called insoluble, the other in powder or scales, the so-called soluble. The digestive standard has been fixed very high, as no less than three thousand times its own weight of freshly coagulated and disintegrated egg albumin is required to be dissolved in six hours when tested by the official process. Compared with this, our own standard for pepsin seems very low, viz., to be capable of digesting only fifty times its own weight in half-an-hour. I have, however, found that many pepsins that will digest very large quantities of albumin if a lengthened period be allowed, will, in point of time, only just comply with the B.P. requirements.

*Cocaine Hydrochlorate* must not lose weight when dried at the temperature of a water-bath for a short time, and is to be specially examined for any trace of cinnamyl-cocaine or other bases derived from coca leaves.

*Elixir of Orange*, which when made according to the 1880 edition somewhat resembled the simple elixir of the B.P.C., is now superseded by an aromatic elixir. The latter contains the oils of lemon, coriander, and anise, in addition to oil of orange, and a slightly different procedure is adopted for its manufacture.

*Extracts of Cimicifuga, Jalap*, and *Cascara* are prepared by evaporating alcoholic solutions of the drug to the proper consistence. The English extract of jalap, it will be remembered, is made by exhausting the powdered tubercules first with spirit and then with water, the resulting products being afterwards mixed together. Extract of cascara approximates to our own preparation very nearly, and if the British liquid extract of cimicifuga were evaporated, it would differ but slightly from the American preparation.

*Citrate of Iron and Quinine* was prepared according to the last Pharmacopœia of the United States by dissolving quinine in solution of ferric citrate. Our own process directs the preparation of ferric hydrate and quinine, which are successively dissolved in citric acid, with subsequent addition of ammonia and formation of ammonium citrate. The first process yields garnet-red scales, which are only very slightly soluble, while the second yields deliquescent golden-green scales. The old form is still retained, but another form by which scales similar to our own preparation may be produced, is included, and is known as the soluble citrate. In this, ferric citrate and quinine are directed to be dissolved in citric acid, and ammonia water added until the liquid acquires a greenish-yellow tint, when it is evaporated and scaled in the usual way. It contains 11·5 per cent. of quinine and 1 per cent. of metallic iron.

*Glycerites of Carbolic and Tannic Acids.*—These are somewhat stronger than the corresponding B.P. preparations, being 1 to 4 by weight, as against 1 to 5.

*Glycerite of Boro-glycerine* resembles glycerin of borax, but it is made by dissolving 31 per cent. of boric acid in glycerin.

*Oleate of Zinc* is now made official, but it is only half the strength of the B.P. preparation.

*Spirit of Glonoin* is slightly weaker than our liquor trinitrinæ, inasmuch as it contains one part by weight of glonoin in 100 parts, compared with one part by weight in 100 fluid parts. The specific gravity is given as ·826 to ·832. It may be presumed from this that the strength of the alcohol used is likely to vary. It would appear better to have ordered the solution to be made with spirit of a definite strength, as is done in the addendum, then the specific gravity could have been actually fixed.

*Tincture of Strophanthus* is prepared by percolation with dilute alcohol. No directions are given for the removal of the oil, which is of so disagreeable a character. This seems regrettable, as it exists to the extent of 30 per cent. or more, and is easily removed by ether, as in our own process, or partially by expression, as directed by the German Pharmacopœia, although no doubt less of the oil is extracted than would be the case if a stronger alcohol were employed.

*Hydrarg. cum Creta.*—Another but not a novel process is adopted for this. The mercury is ordered to be shaken with clarified honey until globules are no longer visible under a lens magnifying four diameters. As the time occupied in shaking should occupy about ten hours in the aggregate, mechanical means are recommended. The mixture is then triturated with the chalk which has been previously rubbed into a thin paste with water the product being finally dried, first between ample folds of bibulous paper, afterwards at the ordinary air temperature. The resulting powder is about 5 per cent. stronger than hyd. c. creta, B.P., and is rather stickier than seems desirable, while the mercury comes out so readily under pressure that, to finally obtain the product in a powder, disintegration by other method than trituration is directed. Having these facts in view, the new process does not seem to possess apparent advantages over the discarded one, while for some purposes serious objections might be urged against it.

*Opium.*—None may be used now that contains less than 9 per cent. of morphine, while in the dried powder not less than 13 per cent. and not more than 15 per cent. must be present. The last edition admitted variations between 12 and 16 per cent., while our own pharmacopœia, for purposes other than the extraction of the alkaloids, directs that the dried powder must contain as nearly as possible 10 per cent. of morphine, and practice has shown that this requirement is hardly to be improved upon. The tincture, wine, and extract of opium have therefore to be standardised when finished, the dried extract being required to contain 18 per cent., and the tincture and wine from 1·3 to 1·5 per cent. of morphine. The extract, therefore, is slightly weaker than the B.P. preparation, and the tincture nearly twice as strong, while the wines more nearly correspond.

*Extract of Nux Vomica* is also evaporated to dryness, and enough sugar of milk added to make the final product contain 15 per cent. of total alkaloids, the same as our own, but the tincture made with it is slightly stronger.

*Cinchona Bark* is required to contain at least 5 per cent. of mixed alkaloids, half of which must be quinine, but none of its preparations are adjusted to any definite strength. In the fluid extract 1 part of bark is made to produce 1 fluid part, which is practically the same as ext. cinch. liq. B.P., but the process is entirely different, exhaustion being carried out first with alcohol and glycerin, afterwards with alcohol and water.

*Paraffins.*—Three varieties are recognised, only one of which at all corresponds to our own, viz., the softer one. The respective melting points are:—

| | U.S.P. | | B.P. |
|---|---|---|---|
| Soft, | 40°—45° C. | Soft, | 35°—40°·5 C. |
| Hard, | 45°—51° „ | Hard, | 43°·3—62°·8 „ |

The softer one has about the consistence of a soft ointment, while the harder variety is about the consistence of a cerate. The third is in a liquid form, and should be colourless, or nearly so, and free from fixed oils and fats of animal or vegetable origin.

*Compound Liquorice Powder.*—Oil of fennel supersedes the ground fruits in this powder. No apparent reason can be seen for this change, and the alteration appears a doubtful advantage.

*Spirit of Nitrous Ether* is now directed to be made by distilling sodium nitrite, alcohol, and sulphuric acid together. The washed and dehydrated product is then dissolved in 22 times its weight of spirit, and is required to yield 11 times its own volume of nitrogen dioxide, corresponding to 4 per cent. of ethyl nitrite. This is a more stringent requisition than that of our own Pharmacopœia, which requires a yield of 7 volumes of the gas when fresh, and 5 volumes after keeping.

*Syrup.*—I have only one other comment to make, and that is on syrup. Two processes are given for its manufacture: the ordinary solution of the sugar by the aid of heat, or by packing the coarsely-powdered sugar very loosely in a percolator or funnel and pouring on water, regulating the flow of the liquid so that it passes out in rapid drops, returning the first portions of the percolate until it runs through bright, and when all the original liquid has passed, following by water added in portions until all the sugar is dissolved. Simple syrup thus prepared has a specific gravity of about 1·317, which is rather weaker than syrupus, B.P. The process is undoubtedly a good one, and will probably receive extended application in the manufacture of this class of preparations.

[*The discussion on this paper is printed on p.* 674].

## CARL WILHELM SCHEELE.

BY WILLIAM B. THOMPSON.

THE more we ponder over the life and history of Scheele, the greater our amazement becomes regarding the man, and the opportunities which a practical pursuit of pharmacy presents to the mind of inquiry, and to the investigator. Observation would seem to point to the fact that a just conception of what pharmacy includes as a science is best impressed upon the mind and understanding by a direct and constant familiarity, the chosen steps of approach being across the threshold, and *ab initio*. This is strikingly impressed in the narrative of Scheele's history. The family necessities compelled the parent to place his boy at an occupation at the age of fourteen. An acquaintance existing between the father and an apothecary of the town, the business of the latter was chosen, and the youth entered upon his apprenticeship. His first impression was that of wonder, curiosity next became aroused, and investigation followed. The products of the three kingdoms of nature were stored away in the receptacles of that shop, and the rest is a matter of familiar history. Knowledge was enriched, the mysteries of science were unfolded, elements were placed at command, and the hidden forces of nature revealed, all at the hands of an apothecary's apprentice in the obscure shop of an inland village. No collegiate walls ever encompassed him, no theoretical instruction was bestowed, yet note what boy and man became. How much more learned and eminent he might have become is not to the present purpose to surmise. What he did was accomplished with the means at command, and can again be done with advantages greatly multiplied; but the niche of fame occupied by Scheele is a place of honour so completely filled by the achievements of the man that no additional lustre can be shed upon his name.—*American Druggist.*

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### "PHARMACY FOR THE PHARMACIST."

IN the highly important communication read by Professor ATTFIELD at the evening meeting on Wednesday, a note was struck, the significance of which cannot be over-estimated in its bearing upon the progress of pharmacy. For the paper practically embodies an authoritative recognition of the principle that in pharmacy, as elsewhere, the highest development is only attained as specialisation of function reaches its extreme limits. It is not only inevitable that pharmacists must face the realities of their position, but also in every way desirable that this be done sooner rather than later. Nor should there be any doubts or scruples on their part to cut themselves adrift from ancient associations and prejudices, if they can thus more firmly establish themselves as independent practitioners.

The pharmacist should be the only authority in his particular sphere of activity; but in order to attain that position he must also be content to confine himself, in his professional capacity, within that sphere. Though rightly enough and necessarily a man of many parts, he must, as a pharmacist, subordinate all his varied scientific and technical knowledge to the practice and advancement of his art. Pharmacy should not be regarded as a branch of chemistry or botany, nor as the "handmaid" of medicine, but as a distinct branch of medicine, and an art to the proper development of which the technical application of chemistry and botany is essential. The pharmacist is not specially a chemist or botanist, any more than he is a mere hanger-on of the medical profession, but he will reap the greatest benefit from his scientific training by applying the results of that training in pharmaceutical practice, rather than by attempting to usurp the functions of professional chemists, botanists, or medical men.

Nor will his status suffer in any degree by such restriction, for the pharmacist who confines himself to his proper business and conducts it in an efficient manner stands on an equal footing with any professional man with whom he may come in contact. As a specialist his position will be unapproachable by anyone who has not undergone a similar training to himself, and all that is requisite to bring about this much to be desired consummation is that he should first clearly define the mutual relations existing between himself and his art, and between pharmacy and all associated subjects, then strive his utmost to advance and persuade others to advance within the prescribed limits.

### THE VARIATION OF SECRET REMEDIES.

IN two recent cases of prosecution under the Pharmacy Act, the evidence given by chemical analysts as to the amount of morphine contained in the preparation to which the cases related, shows that in this important particular there is very considerable variation, the quantities found in a fluid ounce differing from one-tenth of a grain to a quarter and four-tenths of a grain. It appears, therefore, that, in addition to the danger attending the use of medicinal preparations without a knowledge that they contain poisons of such potency as morphine, etc., there is a further danger likely to arise from such preparations being at one time much stronger than at others. This circumstance was lately referred to by the *British Medical Journal* as constituting a strong argument in favour of measures for compelling disclosure of the composition of all proprietary medicines upon their labels. In the case of those containing poisonous or potent ingredients such a disclosure is certainly desirable as a warning against improper use, and if, as our contemporary remarks, the danger of concealed poison is supplemented by a further danger arising from variation in the composition of proprietary medicines, it must be evident that such a regulation is doubly necessary.

### AN IMPERIAL PHARMACOPŒIA.

AT the evening meeting of the Pharmaceutical Society last Wednesday, a paper was read by Professor ATTFIELD on this subject, in which he gave an account of the progress which has been made towards the proposed adaptation of the national pharmacopœia to the requirements of India and the colonies. It appears that this project meets with the approval of the General Medical Council, whose special business it is to produce the work which is to serve as a standard for the preparation of medicines, and that it has also the advantage of being supported by the President of the Council, Sir RICHARD QUAIN. A full report of the paper will be found at page 661, and it is unnecessary that we should, at present, comment further upon it.

### THE DANGERS OF DOCTORS' SHOPS.

An instance of what may occur when drug shops are kept by medical men who leave unqualified assistants in charge occurred recently at Glasgow, when a purchaser was supplied by a lad, sixteen years old, with carbolic acid instead of carbolic lotion. Serious injury was caused by applying this to a man's leg, disabling him for some weeks, and the proprietor of the shop, Dr. C. W. Stewart, Govan Road, was mulcted in damages, with expenses, at the Glasgow Sheriff Court on Saturday last. For the defence, it was urged that the business was in charge of a qualified man, who happened to be temporarily absent when this particular sale took place, but since he does not appear to be registered, his qualification is non-existent from a legal point of view. The Sheriff, in commenting on the case, remarked that great care was required of druggists and their assistants, and they must be held liable for negligence. It was part of their business to take precautions against the stupidity, ignorance, and defective memory of their customers, and in the present case there had been gross negligence.

### UNQUALIFIED DEALERS IN POISONS.

The *Lancet*, referring to the case reported last week (*ante*, p. 658), in which a Liverpool dealer in photographic materials—who was not registered under the Pharmacy Act—was fined for selling cyanide of potassium, observes that it is very undesirable that such powerful poisons should be sold in an indiscriminate manner, even by those who know the nature of the article with which they deal. It is further remarked that "the vigilance of the Pharmaceutical Society in endeavouring to stop the indiscriminate sale of poisons, abundant evidence of which is afforded by several recent cases, will be heartily approved.

### INSECT POWDER PROSECUTION.

At the Court of Session, Edinburgh, on Tuesday, before Lord Wellwood, an action was brought by the Misses Keating, carrying on business in London (under the name of Thomas Keating), as manufacturers of insect powder, to have Alexander MacCallum, chemist, 19, Grassmarket, Edinburgh, interdicted from selling as Keating's insect powder, powder not manufactured by the complainers. At the conclusion of the complainers' case, it was intimated to the court on their behalf that they would consent to the note of suspension and interdict being refused, with expenses. Lord Wellwood said he thought the complainers had adopted a very judicious course, as, even on their own evidence, he would have decided against them. We understand that a number of scientific experts were prepared to appear as witnesses for the defence, and that a probable result of the failure of this action will be the withdrawal of a number of other similar cases.

### JUNIOR PHARMACY BALL.

This annual gathering took place at the Portman Rooms, on Wednesday evening last, and was in every way as successful as former meetings, thanks in great measure to the efforts of Mr. H. Arliss Robinson, the Honorary Secretary. A large and distinguished company was present, amongst others being Mr. and Mrs. Michael Carteighe, and Mr. Richard Bremridge.

# Transactions of the Pharmaceutical Society.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Thursday, the 15th inst., the Librarian and Curator presented the following reports of donations to the Society's Libraries and Museums:—

*To the Library in London.*

**École supérieure de pharmacie de Paris**:

Combinaisons des sulfures de phosphore, d'arsenic et d'antimoine avec les halogens, par M. L. Ouvrard, 1893.

Contribution à l'étude des asclépiadacées, par J. M. Ricardou, 1893.

Recherches sur l'anatomie comparée de l'estomac des ruminants, par J. A. Cordier, 1893.

**Professor Dr. François Gay, Montpellier**:

Étude sur le coton absorbant chirurgical, 1892.

Sur la préparation et les caractères du liniment de Rosen, 1893.

Étude sur la gaze pheniquée, 1892.

Nouvelles observations sur le titrage et la fabrication de la gaze iodoformée, 1893.

Sur le tannate de mercure, 1893.

Essai d'une classification des opérations et formes pharmaceutiques, 1893.

**Mr. D. A. Van Bastelaer, Brussels**:

Études, discours et mémoires rélatifs à la pharmacie, tome 2, 1893.

**Imperial Botanic Garden of St. Petersburg**:

Acta horti petropolitani, tom. 13, fasc. 1, 1893.

**Kaiserliche Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher**:

Katalog der Bibliothek, 4. Lief., 1893.

Nova Acta, 57.–58. Band, 1892–93.

**Dr. Theodoro Peckolt, Rio de Janeiro**:

Historia das plantas medicinaes et uteis do Brazil, 5. fasc., 1893.

**Royal Society of Edinburgh**:

Proceedings, vol. 19, 1891–92.

**University of Edinburgh**:

Supplement to Calendar, 1893–94.

**American Pharmaceutical Association**:

Minutes, reports, papers, and discussions, 1893.

**U.S. Department of Agriculture**:

Division of chemistry, Bulletin, nos. 36–37.

**Dr. E. R. Squibb, Brooklyn, N.Y.**:

Ephemeris of materia medica, etc., vol. 4, no. 2, 1894.

**Mr. T. H. Keer, 9, Bruton Street, London**:

Practical treatise on the history, medical properties, and cultivation of tobacco, by J. Jennings, 1830.

**Professor Attfield, 17, Bloomsbury Square, London**:

Reports for 1886–92, on the British Pharmacopœia.

**Royal College of Physicians of London**:

List of fellows, etc., 1894.

*To the Library in Edinburgh.*

**Alumni Association of the Philadelphia College of Pharmacy**:

Report for 1892–93.

**Mr. J. R. Young, 17, North Bridge, Edinburgh**:

Journal of the Society of Chemical Industry, 1893.

**Pharmaceutical Society of Australasia**:

Annual report, 1893.

Australasian Journal of Pharmacy, 1893.

**Pharmaceutical Society of New South Wales**:

Pharmaceutical Journal of Australasia, Jan. to May, July and August, 1893.

**Mr. D. McGlashan, Edinburgh**:

Pharmaceutical Journal, October 15, 1892, to December 30, 1893.

**Dr. M. Greshoff, 's Gravenhage:**
Monographia de plantis venenatis et sopientibus quæ ad pisces capiendos adhiberi solent.
**Dr. E. R. Squibb, Brooklyn, N. Y.:**
Ephemeris of materia medica, vol. 4, no. 2.
**Professor Attfield, 17, Bloomsbury Square, London:**
Reports for 1886–92, on the British Pharmacopœia.

*To the Museum in London.*

**Messrs. Hodgkinson, Treacher, and Clark, London:**
Large specimen of Chinese rhubarb.
**Mr. W. Elborne, London:**
Specimen of iridescent steam coal.
Specimen of a new kind of jaborandi.
**Messrs. Hearon, Squire, and Francis:**
Fine specimens of Persian opium in sticks.
**Mr. H. Burrows:**
Specimen of Mazawattee tea.
**Professor H. Greenish:**
Specimens of spurious cola nuts and of spurious jalap.
**Messrs. Schimmel and Co., Leipsic:**
Album of photographs of their factories.
**Messrs. W. J. Bragg and Co., Liverpool:**
Large specimens of a new kind of jaborandi and of vanillin.
**Messrs. Harker, Stagg, and Morgan, London:**
Specimen of a new kind of jaborandi.

## EVENING MEETING IN LONDON.

*Wednesday, Feb. 14, 1894.*

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR

The third evening meeting of the session was held on Wednesday evening, the chair being taken by the President, at 8 o'clock.

The PRESIDENT called on Professor Attfield to read his paper on

"AN IMPERIAL BRITISH PHARMACOPŒIA."

This paper is printed on p. 661, and gave rise to the following discussion:—

The PRESIDENT said the paper was of a very suggestive character, but could not be seriously discussed on that occasion. Probably many present would not agree with everything which had been stated, but he suggested that opinions were invited by the Professor on the question whether or not it was desirable that some attempt should be made to add to the existing British Pharmacopœia something which would make it, if not the sole work, at any rate the most important from the pharmaceutical point of view in use in all parts of the British Empire. Of course, in Canada it would have a formidable rival in the United States Pharmacopœia; the Canadians were very loyal to the British Empire, as well as good pharmacists, but they were very advanced in their views, and due allowance must be made for that fact. He should rule any discussion of details out of order, but would invite opinions from pharmacists—not only those present, but all over the world—as to the advisability of asking the Old Country to spend some of its time and money, and to make use of the official editor, than whom none could be better qualified to produce an Imperial Pharmacopœia. In such work a great deal of tact and discretion would be required, and Professor Attfield, in addition to his scientific reputation, was well known to possess those qualities when dealing with complicated questions.

Mr. GILES said he took an interest in this matter from the fact that in years long gone by, when the relations of pharmacists to the pharmacopœia were very unsatisfactory and galling to him, he took a deep interest in that question, and was somewhat combative about it. He recognised with great satisfaction the altered condition of things now obtaining, and confessed that, in earlier days, he must have been somewhat hasty in some of his expressions, and that pharmacists had not then done all they should to entitle them to take the position they desired. Since then great progress had been made, the establishment of the Research Laboratory being one of the most important facts which had undoubtedly given the Society an influential position in the eyes of both the Medical Council and the public. The idea of an Imperial Pharmacopœia was at first rather startling, but it looked to him like a healthy development, and he was hopeful that it might result in something practical. Some years ago there was talk of a universal pharmacopœia, to which he did not take very kindly, as that idea was premature, say by about a thousand years, but this idea seemed more reasonable, and would be a great advantage in many ways. No doubt the American Pharmacopœia would be a competitor in Canada, simply because of the constant interchange of prescriptions between the two countries.

Mr. MARTIN desired first to acknowledge on behalf of all pharmacists the debt which they all owed to Professor Attfield for the part he had taken in bringing about the recognition of pharmacists in connection with the national pharmacopœia. He congratulated Professor Attfield and the Society on the loyalty he had shown during so long a period to pharmacy, and hoped he would see the full fruition of his desires in an Imperial British Pharmacopœia which would be accepted throughout the Queen's dominions. He would suggest that pharmacists might help a little more than they had done in one particular way; he understood it was intended to include in the pharmacopœia all substances which were really in use in the practice of medicine, and that inquiries were to be addressed to hospitals and medical bodies on this point. Now he would suggest that if representative pharmacists throughout the kingdom were to examine their prescription books and tabulate the drugs prescribed, it would be of enormous value in coming to a decision as to what should be excluded from or included in the pharmacopœia. He was very glad to see that the editor was alive to the soundness of the view taken in the United States with regard to substances controlled by patent or proprietary rights, and had no doubt that pharmacists generally would concur in that view. He hoped the younger men amongst them would take note of the emphasis laid on pharmaceutical research, and if they had not time or opportunity for undertaking researches in chemistry or physics, which were perhaps more fascinating, would be encouraged to devote some attention to pharmaceutical research, which was within their reach and was of great importance in the interests of humanity.

Mr. JOS. INCE said he should have liked to say something with reference to the question of nomenclature, and especially the introduction of so-called "indeclinable nouns" into the pharmacopœia, but after the President's ruling he could only refer to it in a general way. He would simply point out that it was not fair to physicians and surgeons, who had to write prescriptions, and in so doing had to say so much *of* something—*i.e.*, to put it in the genitive—to present them with these so-called indeclinable nouns. Of course they were not indeclinable really, but it was unfair to throw back the practitioner on the grammatical knowledge he had acquired many years ago at school, when the pharmacopœia ought to be his guide and assistant.

Mr. EKIN said times were changing very rapidly, and considering the excellence of manufacture which had now been attained, it seemed hardly necessary to devote so much space to directions for ensuring the purity of chemicals, and it might be occupied with other things which were now omitted. If the pharmacopœia were to have a wider scope, it seemed to him it should be much simplified. Of course a number of things must always be omitted, but this was not of so much importance when there were such excellent "extra" pharmacopœias as those of Squire and Martindale. The formulas for many of the tinctures were now obsolete, and they might be replaced by other articles in general use which were now omitted.

Mr. Umney said they were very fortunate in having a man like Professor Attfield to take the initiative in this matter. He had been connected with that institution more than a third of a century, and for the last twelve or fourteen years he had also been in touch with the Medical Council, so that he was in a better position than any other man to put forward this matter, and was also possessed of that tact which was so requisite. He was glad to see that certain signs had emanated from India, though he did not quite agree with the ideas put forward as to the omission of certain matters from the pharmacopœia. It was quite outside the province of the pharmacist to decide whether saffron was useless or not; that was for medical men to say. There were distinguished men who held that it had considerable value, and before it could be omitted from compound tinctures in which it now found a place it must be decided to be worthless; if it were, all would agree that the sooner it was expunged the better, but the question of expense should not enter into consideration. The same with regard to oil of lavender, though it was not necessary that it should be distilled in Britain to ensure its purity; it grew in the Riviera, and oil of equal purity and at much less cost could be obtained from that source. As to the metric system, he should like to see it introduced, but there were difficulties in the way, especially when so distinguished a man as Sir William Harcourt said the time was not yet ripe for it. By some circuitous route or other it would have to be worked into the pharmacopœia, or it certainly would not be up to date; perhaps the two formulæ might be put side by side. He agreed very strongly with what Professor Attfield said about official synonyms. It was not creditable to make preparations from obsolete pharmacopœias, a great majority of which were only retained from considerations of £ s. d. Spirit of nitre of specific gravity ·850 was made by the old London Pharmacopœia, and sal volatile from the same source, not because it was more efficient, but because it contained less alcohol, and was therefore cheaper. Mr. Ekin said a good deal less need be put in the pharmacopœia about purity, but the tests should certainly not be relaxed in any way. He thought there would be little difficulty in realising the imperial idea; but he thought the most practical course would be to publish the ordinary pharmacopœia brought up to the highest degree of perfection with an appendix for Canada, Australia, India, etc. He frequently came in contact in business with Australian and New Zealand chemists, and he found that there was very little outside the British Pharmacopœia asked for. In fact, if they were asked to produce an appendix he thought that they would find great difficulty in doing it. Since the concession had been granted of shipping alcoholic preparations in bond, business was carried on with the colonies almost the same as with the north of England, and their pharmacy seemed to run very much on English lines.

Mr. Martindale said he visited Canada last autumn, and on making inquiries was agreeably surprised to find that the pharmacists there were very loyal to the British Pharmacopœia, though they suffered a great deal from the invasion of United States preparations.

Mr. Hills said the idea of an Imperial Pharmacopœia had a certain charm, and if found practicable, as he hoped it would be, it would be useful in promoting a feeling of solidarity throughout the Empire; anything which did that, whether the visit of an Australian cricket team or anything else, was to be encouraged. He would join with previous speakers in congratulating Professor Attfield on the work he had already done in connection with the pharmacopœia and the recognition of pharmacists in connection with it, and he should like to add his personal testimony as to the great interest which Sir Richard Quain had taken in the matter, and how delighted he was to see that it was possible to associate pharmacists with the compilation of the pharmacopœia.

Professor Attfield, after acknowledging with gratitude the kind things which had been said about his own work in connection with the pharmacopœia, said that any tact or business qualifications of a non-professional character which he might have displayed were owing mainly to the advice and assistance he received more than forty years ago from Mr. W. F. Smith, of Walworth, whom he was delighted to see present on that occasion. With regard to Canada, both the British or Imperial and the United States Pharmacopœia must be used, but there could be no competition in the sense of the latter being the one officially recognised. The only fear he had of competition arose from the fact that some time ago the Canadians, finding the British Pharmacopœia did not give them all they wanted, talked about getting one of their own. But he believed any such idea was now given up, and he lately heard on very good authority that they would accept the Imperial Pharmacopœia as a way out of the difficulty. He thoroughly endorsed Mr. Martin's suggestion that pharmacists would do a great service if they would examine their prescription books and prepare statistics as to the drugs prescribed, carefully avoiding any expression of opinion on their therapeutical value. Medical men would be much obliged for such information. They would all agree with Mr. Ekin that it would be a good thing to simplify the pharmacopœia if it could be done, but there came in the difficulty as to the difference of medical opinion. It was a curious fact that in some parts of the country articles were never used which elsewhere were commonly employed, and whilst anything was used by a really substantial body of persons, it would be undesirable to omit it. It was there where statistics would be so valuable. The omission of saffron was a medical question, but it was brought before the Medical Council by medical men; so long as it was ordered, of course pharmacists must supply it. The metric system, he was glad to say, had the sympathy of the Medical Council, as was shown by the increasing recognition accorded to it in successive pharmacopœias, and a further step in the same direction would only be an expansion of the existing practice.

The President, in proposing a vote of thanks to Professor Attfield, said he would remind him that while some persons were too much inclined to run in a groove, others were too enthusiastic. Pharmacists as a rule were men of advanced views, and so were many medical men, and he hoped therefore that while conserving that which was necessary for the safety of the public and the protection of medical men, he would not be blind to the importance of making the pharmacopœia a reflection not only of the pharmacy of the country, but also of the science from which it sprung.

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The next paper was by Mr. Lucas, entitled

### Laboratory Notes.

It is printed on p. 665, and gave rise to the following discussion.

The President said it was very pleasant to have another paper emanating from the historical laboratory of John Bell and Co. He was sure the author would be glad to hear any criticisms upon it.

Mr. Martin suggested that there was so much in this paper that it would be well to adjourn the discussion.

The President said that could not very well be done, as a lecture had been arranged for the next meeting.

Mr. Millard thought the paper was of so much importance that it was worth having an evening specially devoted to it, especially as it had a very important bearing on the question of the forthcoming pharmacopœia, on the improvement of pharmacopœia processes, and on several points connected with the United States Pharmacopœia. He should like to have heard these latter points discussed, as the latter seemed to have followed the English lead rather strictly without any improvement in the matter of standardisation, except in the case of cinchona and the extract of nux vomica, with regard to which there appeared to be no distinction between brucine and strychnine.

Mr. Umney suggested that some of the points referred to were slightly out of date—for instance, the suggestion that turmeric was always found in rhubarb. He believed the idea came from Royle's 'Materia Medica,' and he should like to ask Mr. Lucas whether he ever found it, or knew anyone who had found it. Again, he referred to a statement by Dr. Paul that animal or curd soap contained two or three times as much water as any other soap. Considering that the water in soap, as a rule, was from 20 to 30 per cent., and three times thirty was ninety, he thought that was rather a strong statement. With regard to citro-tartrate of soda, the present form had been accurately adjusted, so that when the salt was dissolved it was just faintly acid, the original form having been faintly alkaline. The public did not like alkaline drinks, and it was therefore altered; but he understood Mr. Lucas proposed to increase the citric acid from 6 ozs. to 6½ ozs., which was rather a large increase, and to his mind would be objectionable. With regard to the adulteration of scammony, again, the use of natural scammony had almost gone out, not 1 lb. being used now where 100 lbs. were used, say thirty years ago, owing to the introduction of the resin, or what was known as McAndrew's scammony. "Adulteration" was hardly the proper term to apply to such small quantities of starch as were sometimes found. Scammony was a natural substance, and some specimens did not come up to the standard, which was 75 per cent. of resin. Originally it was 80 per cent., and there were constant disputes with analysts and others with regard to it, and therefore it was reduced to 75; but many specimens only contained 60 per cent. or less. Still they were not adulterations; they were simply inferior specimens, such as were met with in the cases of rhubarb and senna. The amount of starch found was so small that it would be ludicrous to suppose that it was put in for the purpose of adulteration.

Mr. Martindale said he did not quite understand what was said with regard to the spirit of glonoin, but understood that in the United States Pharmacopœia it was a 1 per cent. solution by weight of all the substances, and in this respect was exceptional to the others, which were merely 1 per cent. by volume, such as the liquores sodii arsenatis and potassii arsenitis.

Mr. T. Greenish said he could state positively that scammony found on the London market had been largely adulterated with starch. He investigated the matter many years ago, and read a paper upon it at the Conference in London. In some cases at least the mixture could not have been accidental.

The President said he thought the purport of Mr. Umney's observation was that the resinous scammony had practically superseded the natural article.

Mr. Christy asked if the indiarubber suggested to be used in plasters was what the Americans called chewing gum.

Mr. Holmes said he could corroborate Mr. Lucas's statement that scammony did contain starch as an adulterant. It was not mixed in this country, but it certainly was adulterated abroad.

Mr. Lucas, in reply, said the drugs which came to England might be very pure or they might not, but he had had opportunities of seeing how they were sometimes sent out abroad, and he had certainly seen rhubarb containing turmeric. With regard to the dried curd soap, he quoted from a statement of Dr. Paul in tho 'British Journal of Dermatology' for March, 1890. As to the effervescent preparations in the addendum, he believed they were first worked out in the laboratory in Oxford Street, and the slight modification suggested had been found desirable. Natural scammony was still used in some places in considerable quantities, though perhaps not everywhere, and it by no means always contained 75 per cent. of resin, and starch was frequently present to a considerable extent. In fact he believed that such additions of extraneous matter was by no means uncommon. He had seen the Chinese adding earth to catechu to make it weigh heavy before pouring it into the moulds. Spirit of glonoin was an exception to the general rule of solids by weight and liquids by measure. The indiarubber he referred to was sent to him as Para rubber.

The President having proposed a vote of thanks to Mr. Lucas, it was carried unanimously.

The President then drew attention to an album which had been presented to the Society by Messrs. Schimmel and Co., of Leipsic, containing photographs of the various portions of their works and the machinery employed, which he had no doubt would be very useful, when placed in the library, to persons who had to design new machinery.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACT.

### SALE OF POWELL'S BALSAM BY A GROCER.

At the Derby County Court, on Tuesday, before his Honour, Judge Kenelm Digby, an action was brought by the Pharmaceutical Society against William Arnison, grocer, of Melbourne, near Derby, to recover a penalty of £5 incurred by the defendant in keeping an open shop for the retailing, dispensing, or compounding of poison, contrary to the Pharmacy Act of 1868.

Mr. T. R. Grey appeared for the plaintiffs, and Mr. Bonsey for the defendant.

Mr. Grey, in opening the case, said that the defendant carried on business at Derby Road, Melbourne, and on October 18 last year he sold a bottle containing a mixture which was called Powell's balsam of aniseed. That mixture contained morphine, which was a poison within the meaning of the Act, and the defendant, not being a chemist or druggist registered under the Act, was liable to a penalty. The Act was the 31st and 32nd Vic., c. 21, and it was an Act to regulate the sale of poisons, and to amend the Pharmacy Act of 1852. He defined the object of the Act—which is to provide for the safety of the public—and sketched the provisions of the measure which bore on this case, stating that, according to the definition in the second section of the Act, poisons are any of the articles which are mentioned in the schedule, and these include opium, and all preparations of opium or poppies.

His Honour: There has been some case about morphine lately, has there not?

Mr. Grey: Yes; I will call your Honour's attention to that a little later. Section 15 of the Act, he went on to say, made every offender liable to a penalty of £5; section

16 reserved the rights of certain persons to exemption; and section 17 dealt with the regulations to be observed in the sale of poisons. Even registered persons, when they sold poisons, had to make entries in a book kept for that purpose; they had to enter the date of the sale, the name and address of the purchaser, and the name and quantity of the article, so that the poison might be traced, if occasion arose. Bottles which contained poison must have that fact stated on labels, and altogether it would be noticed that throughout the Act the provisions were absolute. It took no account of the quantity or proportion of poisons; therefore if anyone sold any of the poisons in the schedule in their simple state, he would be liable, however small the quantity sold. He knew that his learned friend would not argue against that.

His Honour: If the poison is pure?

Mr. Grey replied that if any of the poisons mentioned in the schedule were sold mixed with other ingredients, the sale was illegal, however small the quantity sold might be—that was, of course, providing that an analyst could prove to his Honour's satisfaction that there was poison in the mixture. In this case he could not only prove that, but he could go further; because Dr. Paul, an eminent analyst, would tell his Honour that not only did he find morphine in this bottle which the defendant sold, but that he ascertained the quantity which it contained, and it was one-tenth of a grain of morphine. It was hardly necessary to tell his Honour that morphine was one of the most dangerous poisons, and that children were peculiarly susceptible to the smallest dose. For that reason it was necessary that the sale of anything containing it should be regulated, so that it should not be sold by others than those who understand and have practical knowledge of poisons. The prohibition under the Act was not confined to the sale of the scheduled poisons in their simple state, but it extended to the sale of any compounds or preparations of them containing the scheduled poison as one of the ingredients. In proof of this contention he cited the case of the Pharmaceutical Society against Piper (1893, 1 Q. B., 686). The conditions in that case were these: a firm of grocers sold a bottle of a proprietary medicine—a bottle of chlorodyne—and evidence was given to show that it contained one grain of morphine, the active principle of opium. It was held that the prohibition under the Act was not confined to the sale of scheduled poisons in their simple state, but that it extended to the sale of compounds or preparations of such poisons containing the scheduled poison as one of its ingredients. And it was further argued that proprietary medicines did not come under the exemptions in section 16. Both these contentions held good with regard to Powell's balsam of aniseed. With regard to the defence raised in the Piper case, which had reference to quantity, he referred his Honour to an observation of Mr. Justice Lawrance, who said that of course every case could be so put as to appear ridiculous: in the case which had been put of a medicine containing only an infinitesimal quantity of poison, it was obvious that no harm would be done by labelling it poison, and it would tend to protect the public.

His Honour: Do you go to this length, that supposing the quantity of poison is so small that the aggregate compound cannot be called poison, do you say that that would come under the Act?

Mr. Grey: There is no case on that, and it is difficult to decide the point, but I do go the length of holding it.

His Honour: Although the thing as compounded is no poison at all?

Mr. Grey: That depends on how you define poison.

Mr. Bonsey: That is the whole point of the matter. That is what is between us. It has never been decided.

Mr. Grey said that in the case to which he had alluded it was held by the judges that the article in question was a poison within the meaning of the Act. It was a preparation of opium, and if taken all at once might have killed an adult. The definition of capability to kill an adult was the definition which Mr. Bonsey gave, but there was no such definition at all. With regard to the definition of poison, Lord Coleridge had said it was "that which when administered was injurious to health and life," in the case of Cramp (5 Q. B., 307) and Mr. Justice Field went on to say, "If the thing administered is a known, recognised poison, I think an offence may be committed if the quantity administered is so small as to be incapable of doing harm." He simply called attention to that in order to show that the definition set up by Mr. Bonsey was not a proper one. They had nothing to do with the definition of poison in a criminal sense; but, on the grounds he had stated, he submitted that an offence was committed in a case like this, however small the quantity of poison was contained in the compound.

His Honour: You go the length of saying that a compound containing any quantity—however small—of pure poison, is a poison?

Mr. Grey: Yes; there might be in the bottle a little quantity, but the vendor was selling a compound containing a poison of which he was supposed to be ignorant, and of which he really was ignorant.

His Honour: He must not touch it at all.

Mr. Grey: He must not touch it, because the Act restricts him. In the Piper case Mr. Justice Collins seemed to have taken the view that the Act applied to the sale of a compound which was made up in part of a scheduled poison, and it seemed proper to entertain that now. He also referred to the case of the Pharmaceutical Society *v.* Delve, as bearing on the question of quantity. In that case no evidence of quantity was given at all. The analyst simply went into the box and said, "I found morphine."

His Honour: Not a trace of morphine—it was more than a trace. The analyst said he was not instructed to take the quantity.

Mr. Grey: And the county court judge was not satisfied with his evidence. He said there was not sufficient evidence of an appreciable quantity of morphine. Mr. Justice Charles said, with regard to that case, "I cannot differ from the conclusion at which the county court judge has arrived. It was proved that the medicine contained a small quantity of morphine; but the analyst was not instructed to ascertain the quantity." He mentioned a very small quantity, which, he said, might be in the medicine, and the county court judge was not satisfied.

His Honour: That makes it a question of fact.

Mr. Grey: It shows that the county court judge must be satisfied with the evidence of the analyst—that there must be morphine.

His Honour: It shows more than that. It shows that the judge must be satisfied that there is a substantial quantity.

Mr. Bonsey: That is my point.

Mr. Grey said that there was another case tried only last week, or the week before, on this very subject. He did not say it was exactly the same case, because there was four-tenths of a grain of morphine, while here there was only one-tenth. In that case judgment was given for the plaintiffs, with leave to the defendant to appeal. He mentioned that case because one of the defences was that if the quantity of morphine contained in these bottles was the same as, or smaller than, the dose contained in the British Pharmacopœia, no offence was committed. That defence was raised in the county court of

Bloomsbury: but the British Pharmacopœia had nothing to do with the Act. If a person, unregistered under this Act, mixed up compounds from the British Pharmacopœia, then he was just as liable. The preface to that work said: "The doses of all the more important medicines are now for the first time appended to the other information concerning them, the quantities stated under this head being intended to represent average doses, in ordinary cases, for adults. These doses are indicated in compliance with a generally expressed wish. They are not authoritatively enjoined by the Council, and the practitioner must rely on his own judgment, and act on his own responsibility, in graduating the doses of any therapeutic agents which he may wish to administer to his patients." It was merely a guide to the practitioner as to proper doses. There was one other passage in the case to which he desired to call attention. Mr. Justice Collins remarked that in his opinion there could be nothing more dangerous than to allow a medicine which was called a proprietary medicine to be sold by any person who knew nothing about it, though it might contain poison to any amount, and he added that if Mr. Bonsey's contention were correct, such a preparation could then be sold by any person, however incompetent, and not only sold, but compounded.

Mr. Grey then proceeded to call evidence.

### EVIDENCE FOR THE PLAINTIFFS.

Arthur Foulds said that on October 18 he went to the defendant's shop at Melbourne, Derby. The name over the door was Arnison, and on the side door was a brass plate, "Registrar of births and deaths." He went into the shop and bought several things, including a bottle of Powell's balsam of aniseed. He subsequently handed the bottle to Mr. Moon, after marking it for purposes of identification.

Harry Moon, clerk in the office of the Registrar to the Pharmaceutical Society, proved receiving the bottle from the last witness. He retained it in his possession until January 4, when he handed it to Dr. Paul for analysis.

Dr. B. H. Paul, consulting and analytical chemist, and Fellow of the Institute of Chemistry, said, in reply to Mr. Grey, that he had had great experience as an analyst. On January 4 of this year he received a bottle from the last witness, and it was the one now produced in court. There was a dark brown liquid in the bottle. The quantity altogether was a little less than a fluid ounce. He had very carefully analysed the contents of that bottle, and he found that it contained the alkaloids of opium, which are the active principles of opium. They amounted to ·23 grain actually. He separated from them a quantity of morphine in a pure state, amounting to one-tenth of a grain, and morphine was the chief medicinal principle of opium—the one present in the largest quantity, and was a dangerous poison.

Mr. Grey: Do the fatal quantities vary very much or not?

Witness: Very considerably. There is considerable variation in the effect of it on different individuals, according to condition and age. In the case of children very minute quantities have proved fatal—extremely minute quantities. There was a case last week in which an inquest was held on a child which had been poisoned by a quarter of a grain of opium. That would represent 0·025 grain of morphine, or to put it exactly, one-fortieth of a grain.

His Honour: How am I to take that?

Mr. Grey: It is admissible as his opinion.

Mr. Bonsey: If he was not there he cannot tell us about it. (To witness): Were you there?

Dr. Paul: No, I was not.

His Honour: The only admissible thing is that it is his opinion. You can cross-examine as to how he gets his opinion if you like.

Mr. Bonsey: But he is fortifying his opinion by reference to a case which occurred last week, and at which he was not present.

His Honour: I don't think I can allow that evidence.

Dr. Paul, continuing his evidence, said he had known several cases in which small doses had proved fatal. It was a matter of common knowledge. He had read Dr. Taylor's well-known work on poisons, and in that he had found cases recorded of very minute doses of morphine being fatal to infants. One of the smallest doses was the one-twelfth part of a grain—he was speaking from memory. But it was certain that extremely small quantities of morphine or opium were known to be very detrimental to children. He had tested for and discovered much smaller quantities of morphine than he had obtained in this case. He had analysed several bottles of this very compound.

Mr. Bonsey objected to this evidence.

Mr. Grey said he had called it simply to show that sometimes there was more than one-tenth of a grain in a bottle.

Mr. Bonsey contended that the evidence was not admissible.

His Honour said he presumed the evidence was simply to show that larger and smaller quantities of morphine might possibly be discovered in bottles of this mixture. All that concerned them, however, was whether this particular bottle before them was a poison within the meaning of the Act.

Mr. Grey said then he would not press for the admission of the evidence.

His Honour: So far it has gone to show that what was found in this particular bottle was a substantial and appreciable quantity.

Cross-examined by Mr. Bonsey.—Dr. Paul said that in his opinion the effect of the contents of this bottle on an infant might be very detrimental. Even a portion of the contents might be. It would depend upon how it was administered.

Mr. Bonsey: Isn't that rather a question for a doctor than for a chemist? It seems to me that the greater part of your evidence is that which a doctor ought to give, rather than a chemist or an analyst.

Dr. Paul: I don't know that it is so.

Mr. Bonsey: I mean to say as to the effect of opium on individuals, and as to fatal doses. It is not strictly speaking within your province as an analytical chemist to give evidence on that point.

Dr. Paul: It is a matter which a chemist is able to understand and to know of as much as a doctor.

Mr. Bonsey: Has a chemist the same experience as a doctor as to the effect of different drugs on human beings?

Dr. Paul: He may have.

Mr. Bonsey: Does he as an ordinary rule?

Dr. Paul: No doubt he does.

His Honour: The Legislature seems to think so.

Mr. Bonsey: You are not consulted as a medical man.

Dr. Paul: No.

Mr. Bonsey: I think you told me the other day (we have met before) that this was a medical question, and not an analytical question.

Dr. Paul: That is so, more especially.

Mr. Bonsey: You say that Dr. Taylor in his book speaks of one-twelfth part of a grain as being injurious to infants. What age was the infant?

Dr. Paul: I don't remember.

Mr. Bonsey: A day old?

Dr. Paul: I don't remember.

Mr. Bonsey: It may have been?

Dr. Paul: I really don't remember.

Mr. Bonsey: The infant may have been a day or two old?

Dr. Paul: It may have been so.

Mr. Bonsey: Dr. Taylor's book is a high authority, I suppose?

Dr. Paul: It has been considered so.

Mr. Bonsey: Is it considered so now?

Dr. Paul: I think it is still considered a good authority.

Mr. Bonsey: The best?

Dr. Paul: I won't say the best, but a good authority.

Mr. Bonsey: You say that the effect of that bottle upon an infant would be detrimental. Did you mean if it were taken all at once?

Dr. Paul: No; some part of it might be.

Mr. Bonsey: Do you say that the doses prescribed on the bottle are improper?

Dr. Paul: I don't know that they are improper; but on that point I think medical opinion would be more valuable than mine.

His Honour: The doses are, for a child four years of age, sixteen drops; for a child eight years old, twenty drops; for a child twelve years old, forty drops, and so on.

Mr. Bonsey: When you speak of the effect of it being detrimental to an infant, do you mean by taking a whole bottle or half a bottle?

Dr. Paul: I mean to say, as far as my opinion is of any value, that those quantities stated on the bottle, administered without proper medical knowledge, might be, and probably would be, detrimental to the persons taking them, especially to children.

Mr. Bonsey: But is not that a question more proper for a doctor than yourself?

Dr. Paul: I have said so. I have stated my opinion as far as my opinion is of any value.

Mr. Bonsey: Of course, much would depend upon the state of the infant at the time it was administered.

Dr. Paul: It is a question of suitability of administration altogether.

His Honour: You say that some portion of this bottle might be injurious to an infant?

Dr. Paul: Certainly.

Mr. Bonsey: And it might be very beneficial?

Dr. Paul: It might, by accident.

Mr. Bonsey: No, pardon me. Is not morphine a useful medicine for adults and children?

Dr. Paul: Properly administered.

Mr. Bonsey: Therefore it might do a great deal of good, instead of being detrimental.

Dr. Paul: As I said before, by accident.

Mr. Bonsey: What do you mean?

Dr. Paul: It might happen to do so, but it requires always to be properly administered.

Mr. Bonsey: You do not mean to say that morphine is not a proper and useful drug to be administered to adults and children?

Dr. Paul: In certain cases, but not indiscriminately.

His Honour: Nobody suggests that. What he says is that it might be.

Re-examined by Mr. Grey.—Was there anything in the other drugs in the mixture which would have any effect on the morphine that you found?

Dr. Paul: Nothing that would modify its action.

Mr. Grey: It is not, as I understand, a chemical compound at all?

Dr. Paul: No. It is merely a compound.

Mr. Grey: It is a mixture—a preparation of opium mixed with other things.

Dr. Paul: Yes, that is it.

Mr. Grey: It is part of a chemist's duty, is it not, to understand all about poisons? It is part of his examination?

Dr. Paul: Certainly it is.

Dr. A. P. Luff, M.D., B.Sc., F.I.C., lecturer in St. Mary's Hospital, analyst to the Home Office, Examiner in Forensic Medicine at the University of London, was the next witness. He said, in reply to Mr. Grey, that he had considered Dr. Paul's analysis of this mixture.

Mr. Grey: What is your opinion of the effect of one-tenth of a grain of morphine as contained in that bottle? Tell his Honour your opinion, bearing in mind the different conditions under which it might be administered.

Dr. Luff: I think that morphine in any dose should only be administered to an individual, subject to a knowledge of the condition of that individual, by a medical man. Morphine is a drug whose action depends very much on the idiosyncrasy of the individual. Much smaller quantities than one-tenth of a grain might be injurious, and with infants might be fatal.

His Honour: Injurious even to adults?

Dr. Luff: Yes.

Mr. Grey: Would the smaller doses affect adults who were suffering from certain diseases?

Dr. Luff: Yes, certainly.

Mr. Grey: And as to young children and infants, are they not peculiarly liable to the action of this drug?

Dr. Luff: They are peculiarly susceptible to morphine.

Mr. Grey: And have there been instances in which quantities less than one-tenth of a grain were fatal?

Dr. Luff: Yes. One-twelfth of a grain of morphine is the smallest quantity recorded as having been fatal. Much smaller quantities of opium have been known to kill infants.

Mr. Grey: That, of course, depends again on whether the child is suffering from disease?

Dr. Luff: It very much depends.

Mr. Grey: With respect to the contents of this bottle, if taken by a child, what effect would it have—supposing the child to be in ordinary health?

Dr. Luff: It would certainly be injurious to such a child, and to an infant it would very probably be fatal.

His Honour: Do you mean the whole bottle taken at once?

Dr. Luff: I was answering the question in that way. It would certainly be injurious, and to an infant probably fatal.

Mr. Grey: What effect would a smaller dose than the bottle have?

Dr. Luff: To children in bad health smaller doses would probably be injurious.

Mr. Grey: Is morphine a good drug to be administered to children?

Dr. Luff: My experience of it—and what I teach students at my hospital—is that it is a drug which should not be given to infants at all; because even in very minute quantities it is very apt to be dangerous.

Mr. Grey: Is it very often used in compounds called soothing syrups and cordials; things to quiet children and keep them asleep?

Dr. Luff: Yes, I know of many cases in which morphine has been so administered.

Cross-examined by Mr. Bonsey.—Are you speaking of very young children, because we sometimes include in that term children who are twelve or thirteen years of age. What do you mean by children?

Dr. Luff: I should not advise its being given to children under six or seven years of age.

Mr. Bonsey: But it is often given by medical men?

Dr. Luff: It is given.

Mr. Bonsey: And by thoroughly competent medical men?

Dr. Luff: It is given. I do not know that I can answer the latter part of the question.

Mr. Bonsey: Is it not a common remedy for children in certain diseases?

Dr. Luff: I should not describe it as a common remedy.

Mr. Bonsey: It is a frequent remedy?

Dr. Luff: As far as my knowledge goes it is not.

Mr. Bonsey: Is it used at all?

Dr. Luff: Yes.

Mr. Bonsey: For cough medicines?

Dr. Luff: Not that I know of.

Mr. Bonsey: You do know. I am not asking whether it is right or wrong, but do give us the benefit of your knowledge.

Dr. Luff: I do not see the prescriptions of other medical men, and therefore I cannot say.

Mr. Bonsey: But you are acquainted with the medical books from which medical men get the greater part of their knowledge. Do not those medical books justify medical men in giving a dose of morphine to children under six?

Dr. Luff: I cannot recollect any book which leads to that conclusion, but probably it may be a right conclusion.

Mr. Bonsey: Do you know any book which says it shall not be?

Dr. Luff: Oh, yes, I know such a book.

Mr. Bonsey: And is it not a fact that it is very greatly used by medical men?

Dr. Luff: I said probably.

Mr. Bonsey: I think you said that you would not yourself administer morphine, and that it ought not to be administered except under medical advice?

Dr. Luff: That is my opinion.

Mr. Bonsey: And therefore, according to your opinion, chemists ought not to sell it?

Dr. Luff: There is a good deal of difference between selling a drug and administering it?

Mr. Bonsey: Would you object to a chemist selling this balsam?

Dr. Luff: No.

Mr. Bonsey: That would be all right?

Dr. Luff: I should not object to it.

Mr. Bonsey: A chemist does not know the component parts of this secret preparation?

Dr. Luff: I do not know.

Mr. Bonsey: Do you go so far as to say that morphine ought never to be administered except under medical men's advice?

Dr. Luff: I do say so.

Mr. Bonsey: Then you would object to the compound being sold by a qualified chemist.

Dr. Luff: No, I should not.

Mr. Bonsey: You don't object to anybody selling it?

Dr. Luff: I do not say that.

Mr. Bonsey: You do not pretend to say that taking that bottle to begin with would be fatal to an adult?

Dr. Luff: I am not prepared to say that. To an adult suffering from Bright's disease, or from disease of the respiratory organs, it might be fatal.

Mr. Bonsey: What is the recorded fatal dose to an adult in ordinary health?

Dr. Luff: Eight-tenths of a grain to an adult in health.

Mr. Bonsey: I see in Guy and Ferrier it says that probably less than a grain in one dose would kill an adult—say about a grain.

Dr. Luff: Guy and Ferrier is an old work.

Mr. Bonsey: Well, you do not go back upon it. The dose in the British Pharmacopœia is from one-eighth to one-half of a grain, is it not?

Dr. Luff: It is.

Mr. Bonsey: That is a medicinal dose?

Dr. Luff: Given by a medical man.

Mr. Bonsey: I mean that the doses in the British Pharmacopœia are not supposed to be poisonous doses?

Dr. Luff: They may be.

Mr. Bonsey: They are not generally?

Dr. Luff: I have known them to be.

Mr. Bonsey: I have not asked you that. Do you mean to say that the doses prescribed in the British Pharmacopœia are not within the limits of safety?

Dr. Luff: The majority of them are, but not all of them.

Mr. Bonsey: I was asking you a question with regard to morphine.

Dr. Luff: If you ask me whether it is absolutely safe, I say it is not.

Mr. Bonsey: You disagree from the British Pharmacopœia?

Dr. Luff: I say that morphine does act deleteriously to persons suffering from certain diseases.

Mr. Bonsey: I am speaking generally of healthy people.

Dr. Luff: My experience is that these things are not given to healthy people.

Mr. Bonsey: Well, they are given as remedies to people in ill-health?

Dr. Luff: Yes.

Mr. Bonsey: And a dose of one-eighth to half a grain is within the limits of safety, speaking generally?

Dr. Luff: I cannot say that is so.

Mr. Bonsey: What is the object of the book?

Dr. Luff: It is to give a rough idea to the medical man what he may administer, but it must be administered subject to his own knowledge of the cases with which he is dealing.

Mr. Bonsey: Morphine is a drug which is almost general in cough lozenges, is it not?

Dr. Luff: Not in my experience.

Mr. Bonsey: Is there not such a thing as a morphine lozenge?

Dr. Luff: Yes.

Mr. Bonsey: Widely used?

Dr. Luff: I have no information.

Mr. Bonsey: It is in the British Pharmacopœia?

Dr. Luff: Yes.

Mr. Bonsey: And each lozenge contains one thirty-sixth of a grain of morphine, and from one to six lozenges is the dose prescribed?

Dr. Luff: Yes, that is so.

Mr. Bonsey: When you speak of it being injurious, do you define a poison as a thing injurious in any degree?

Dr. Luff: I should define a poison as a substance which, either by its direct chemical action or otherwise, is injurious to health or fatal to life.

Mr. Bonsey: But poisons are administered to a great extent medicinally, with most beneficial results?

Dr. Luff: Yes, when properly administered.

Mr. Bonsey: When you say properly administered I suppose you mean that it depends greatly upon the quantity administered?

Dr. Luff: It depends necessarily on the quantity.

Mr. Bonsey: Therefore, when you speak of a child or an infant taking this whole bottle with possible fatal results, it is because the quantity is too great.

Dr. Luff: I do not necessarily refer to the bottle being taken all at once. Successive doses might result fatally.

Mr. Bonsey: That would also apply to a doctor's prescription.

Dr. Luff: Except that doctors' prescriptions must be taken at intervals.

Mr. Bonsey: But if the doctor's injunctions were disobeyed, it might produce the same results?

Dr. Luff: It might.

Mr. Bonsey: It depends on the times at which it is taken?

Dr. Luff: And the quantity ordered.

In re-examination by Mr. Grey, Dr. Luff said he would not say it was necessarily as dangerous to take these things at improper intervals as to take the lot at once. But if taken regularly there would be accumulated effects. There were several preparations in the British Pharmacopœia which contain doses which would be fatal to children, or even to adults, if they were given without a due knowledge of the disease a person was suffering from.

His Honour: Is it not perfectly obvious that doses in the British Pharmacopœia might be fatal, if given at a wrong time? The points here are, what is a poison, and is this morphine a poison in the ordinary sense in the form in which it is given.

Mr. Grey put in the register of the Pharmaceutical Society to show that the name of the defendant did not appear in the list of qualified chemists, and the case for the plaintiffs was closed.

### EVIDENCE FOR THE DEFENCE.

Dr. A. Drewitt, a qualified medical practitioner, M.R.C.S., L.S.A., was then called by Mr. Bonsey. He said that he regarded morphine as a drug useful in various diseases, both for grown up people and for children up to a certain age. He had known Powell's balsam of aniseed as a medicine for many years; when he was practising in the country he knew that it was extensively used for coughs and colds. He had noticed the doses prescribed on the bottle, and in his opinion they were perfectly safe doses to administer to an adult, except possibly in some few cases of advanced kidney disease or great age. He should say also that they were fairly safe for children. Although he had known the mixture to be largely used, he had never heard of any fatal result.

Mr. Grey: You do not say that it has not caused death?

Dr. Drewitt: I only say that I have not heard of it.

Mr. Grey: But you have heard of other patent medicines containing morphine to the same extent causing death time after time?

Dr. Drewitt: I do not know to the same extent. I have heard of proprietary medicines causing death, but it would not be the same quantity, I think.

Mr. Grey: I understand you to say that if taken in the prescribed doses the mixture would be fairly safe. How do you know that?

Dr. Drewitt: My opinion is that it would be.

Mr. Grey: But how did you form your opinion?

Dr. Drewitt: On the ordinary doses of opium which are given generally in practice. I only heard of the strength of the contents of the bottle just before I was called to give evidence. If the mixture varied in strength it might modify my opinion.

His Honour: That is obvious. But there is no evidence of variation before us, it is all about this particular bottle.

Mr. Grey: Is it in your opinion a proper remedy for anyone suffering from diseases of the respiratory organs?

Dr. Drewitt: I do not believe that in ordinary cases there would be any danger; the exceptions would be the elderly people I have referred to before. I know that children are peculiarly sensible to the operation of morphine.

Mr. Grey: In the smallest dose?

Dr. Drewitt: Infants are. I have read that one-twelfth of a grain of morphine has proved fatal to an infant.

Mr. Grey: You have heard Dr. Luff's evidence. Do you agree with it?

Dr. Drewitt: I agree generally with Dr. Luff's evidence, but I think he went a little far as to the danger of the doses. I do not think an ounce of this balsam of aniseed, with its one-tenth of a grain of morphine, could be dangerous to an adult—I do not think it would be fatal.

Mr. Grey: How about an infant? Do you mean to say it would not be fatal to an infant, using the word in a general sense?

Dr. Drewitt: It would be very dangerous.

Re-examined by Mr. Bonsey, the witness said that the recorded case of about half a grain was the smallest fatal dose that was known to the ordinary adult—eight-tenths of a grain he meant.

Dr. J. E. Sands, L.R.C.P. and L.R.C.S. Ed., L.F.P.S. Glas., called by Mr. Bonsey, said that he had been informed of the contents of this bottle. He had heard of the medicine, but was not acquainted with it at all. He had observed the doses on the bottle, and having regard to the quantity of morphine in the bottle, he considered them well within the limit of safety. The smallest dose of the mixture was sixteen drops, and that would contain one three-hundredth part of a grain of morphia, a quantity which would be hardly appreciable. If the mixture was taken as directed on the label, he should say that it was safe in a general way.

Replying to Mr. Grey, the witness said he had not made a special study of poisons. His opinion of this mixture was simply based on what he had heard. He had never advised the medicine himself, and he would not do so if he could prescribe otherwise. He did not know what was in it, except this one-tenth of a grain of morphine.

### ADDRESS OF COUNSEL FOR THE DEFENCE.

Mr. Bonsey then addressed the court for the defence, contending that the plaintiffs had not made out a case within the meaning of the Act. The question involved was really one of very great importance, and one in which there was a very great deal more than appeared at first glance. As it stood at present, the position he took up was this: that Piper's case merely decided, looking at it fairly, that a compound, in which one of the ingredients is a poison, is within the meaning of the Act. The contention between the Pharmaceutical Society and the people they were suing had all along been this. The Society had always insisted, and did still insist, that it was sufficient to show that one of the ingredients of a compound was a poison irrespective of its quantity. That point of quantity was the very point which the Piper case did not settle. On the other hand, the contention had been, in the first place, that the Act did not apply to any case except the poisons in their simple state, and, in the second place, that—if the Act did apply to a compound in which one of the ingredients was a poison—the compound itself must be a poison in the ordinary acceptation of the term.

His Honour: Your proposition is, that the compound itself must be a poison in the ordinary acceptation of the term?

Mr. Bonsey replied that it was so. He submitted that the Court of Appeal was wrong in the Piper case in saying that the Act applied to an ingredient of a compound, and both the judges there said that they had great doubts as to whether they were right in putting that interpretation upon the Act. But in Piper's case, as his Honour would have observed, the quantity of poison was one grain in half-an-ounce, while here there was only one-tenth of a grain in one ounce. The evidence in Piper's case was so strong on the point of quantity that the point raised in this case was left open. The main point argued was that the Act applied to an ingredient, and that ingredient was shown to be present in sufficient quantity—the facts were so strong that the question of law could not be argued.

His Honour: Here you say that the whole point is not the presence of poison?

Mr. Bonsey: It is perfectly clear, from the observations of Mr. Justice Collins. His lordship said: "I do not feel perfectly sure that the conclusion I have arrived at is the correct one. In this particular case I think that the article in question—chlorodyne—is a poison within the meaning of the Act. It contains, among other ingredients, more than one poison, viz., opium and chloroform, both of which are included in the second part of the schedule; and it was sold in a bottle containing sufficient morphine—which is the active principle of opium—to kill an adult (that, I think, is the important point) if the whole of the contents of a bottle were taken at once."

His Honour: That shows he had two things in his mind; first, the thing is poison because it contains a poison; secondly, because if taken it would kill an adult.

Mr. Bonsey, continuing, said that Mr. Justice Collins said "the thing sold was in itself—in its entirety—a poisonous thing—that is to say, a small quantity of it would kill the person taking it." And he added, "Although I am of this opinion with regard to this particular article, chlorodyne, I do not think it necessary to lay down any rule which would cover every possible case where some infinitesimally small amount of poison enters into a larger compound. That question can be dealt with when it arises."

His Honour: Mr. Justice Collins' opinion is that it is a poison because it contains poison.

Mr. Bonsey said if that proposition were once established, the question of whether there was more or less of a scheduled poison would not arise; but the judges said it was not necessary for them to lay down any principle for universal application, or any principle which would apply beyond that particular case. He thought it was fair to say, therefore, looking at the whole of the judges' remarks, that the question in this case was entirely left open. What was decided was this. A compound comes within the Act if it contains poison as an ingredient in a sufficient quantity to make it poisonous. Chlorodyne was a poisonous thing, but, because of that, it is not necessary to lay down a rule. If that had not been so, he could not understand the Delve case, where the point was raised, and they had hoped that it was raised for the express purpose of getting a decision on the very point which had been left open in the other case. The quantity in the Delve case was not given, but there was some evidence that it contained morphine. There was more than a trace. The evidence was, "There was not a trace, there was more. I was not instructed to take the quantity." If Mr. Grey's contention was right, that the Act applied, even when it was shown that there was some of one of the scheduled poisons in the compound, then he said that the decision in that case was not right.

His Honour said it struck him as being a very good authority as far as it went. The proposition was that any appreciable quantity of morphine in a composition would make the whole thing a poison. At that moment he did not understand Mr. Justice Charles' opinion as it was reported. He made it a question of fact. What the judge decided was that the evidence did not show that the quantity was sufficient to justify a verdict for the plaintiffs, that was to say, he supposed the quantity was not enough to make the whole composition injurious.

Mr. Bonsey said it was his desire to point out one or two reasons why that was a reasonable interpretation to place upon the Act. As a matter of fact he submitted that the Act was really intended to apply, as Mr. Justice Lawrance said, only to poisons pure and simple. The argument that it included ingredients could only be supported by inference arising on clause 17, which was the only part of the Act where the word ingredient was used. What the other side wanted to weave into clause 17 was this: That it should be unlawful to sell any poison or any compound of which an ingredient was poison. But such an interpretation, he held, would not be a reasonable one, for this reason. It was said that the Act was to protect the public, and that the object of that action was to protect the public; it was argued that if those drugs were to be sold they should only be sold by properly qualified chemists; that if they were so sold, the public were protected, but if they were sold by people other than qualified chemists, the public were endangered. That was a fallacious view to take of the whole matter. In point of fact, the public were no more protected when those things were sold by a chemist than if they were sold by a grocer, for this simple reason, that the chemist had no more knowledge of the contents of those medicines than the grocer had. The chemist did not go through the form of analysing the drugs which went into his shop for sale any more than the grocer did. If he (Mr. Bonsey) went to a chemist's shop and bought a bottle of this mixture the law would not touch the case at all. The chemist would hand it to him over the counter, and he would take it in the manner prescribed on the bottle. The same thing happened if he went to a grocer. Therefore he was not protected in the least degree, whether the compound were sold by a chemist or by a grocer. As a matter of fact, the object of all this litigation, which had been lately going on, was not to protect the public at all, but a curious state of things had arisen. For a great many years after the Pharmacy Act was passed it was never sought to apply it to preparations of this kind, and he believed that the Pharmaceutical Society acted under the advice of the Privy Council in abstaining from taking proceedings; but there had been an enormous increase in the manufacture and sale of these proprietary medicines, and the sale was extending to other things besides. Therefore the Pharmaceutical Society was seeking to protect the chemists, which it was perfectly entitled to do. It was clear, however, that it was not the public who were being protected. If the Legislature intended that the public should be protected, the way would have been to stop the manufacture of secret nostrums or preparations, then the protection would have been there; but the Legislature did not say that, on the contrary, it sanctioned the preparation of those secret drugs, and derived a very considerable revenue from them, because the man who manufactured them was obliged to pay for a Government stamp. Therefore attempts were made to bring within the Act things which the Legislature never contemplated should come under its operation at all. They could easily understand why the Act should apply to a poison in its simple form, because a chemist knew that if a person asked for a poison he had liberty to exercise his discretion under the law, and difficulties could be put in the way of persons who desired to buy poison in a simple state. But whilst the Legislature had given power for this to be done it had never gone the length of saying "you shall not manufacture secret preparations." Therefore the construction which was sought to be put on the Act, that it could apply to anything except an article which was poisonous in the ordinary and reasonable acceptation of the term, was an improper construction. It was said that the preparation in that case was a poison He asked upon what ground the assertion was based. It was said that it was a poison because it contained one-tenth of a grain of morphine, and that, therefore, this fluid ounce was a poison. He would ask anybody who laid down that proposition first to be good enough to define what poison was, because he had never yet heard a definition which was satisfactory.

His Honour: You have got to do that.

Mr. Bonsey said if he attempted he would be met by the objection that it was defined in the schedule of the Act, and by the statement "we do not want to go beyond that definition," but his answer was that it must be shown that the substance itself was poisonous in its entirety. When they came to consider what was poison, from that point of view, the only question was a question of quantity, and that was not an altogether satisfactory question to settle.

His Honour: What I have to do in this case is to get from the evidence what this compound really is. I shall have to make up my mind on that point. Suppose I come to the conclusion that it is a preparation which, although ordinarily harmless to an adult, may, under certain circumstances, kill him—that if he were to swallow the whole bottle full it might kill him—then it would not be harmless, but in fact, a thing which cannot be taken under certain circumstances without danger to health, and under other circumstances without considerable danger to life. I have not come to that conclusion yet, but that is what I have to consider.

Mr. Bonsey: If that is to be the definition given to poison, then it applies to almost everything in daily consumption.

His Honour: Port wine, for instance.

Mr. Bonsey: And brandy, and whisky, and plum pudding.

His Honour: Hardly that.

Mr. Bonsey replied that it was all a question of quantity. If it were a simple question of what might be the effect upon an individual, or upon a very young infant, or upon an adult suffering from some disease like Bright's disease, then a great number of things would be included besides simple morphine.

His Honour: You say it would enlarge the word poison beyond all reason.

Mr. Bonsey: I say that it would, to define poison in that way. If they were to take such a definition, it would extend the meaning of the word until it was entirely unreasonable, and it would come to this, that it would be only a question of the quantity in which they administered a thing to make it a poison. It was certainly so, because there were many things which, given in excessive quantities, might be poisonous. But they had failed in this case to show that any fatal result had arisen from the use of this particular medicine. Powell's balsam of aniseed had now been in use for very many years, and the plaintiff did not suggest in any way that the use of this compound in an ordinary way, just as food might be used, had caused any fatality to arise. Therefore they came back to the old argument of definition. If they applied the definition which his Honour had been good enough to suggest, it would include many things, like some mineral waters. There were some mineral waters which were recommended because they contained properties which were poisonous—arsenic and other poisons—and if it was to be said that the mere fact of giving some of these mineral waters to children might cause their death was sufficient to bring these waters under the Act, where would the thing stop. It was, as he had said, an entirely unreasonable definition to set up. He submitted that the only way of dealing with this case was to deal with it apart from its technical sense. The plaintiffs said that there were certain cases recorded in the books where certain doses of morphine had proved fatal, but one knew perfectly well that in the books extreme cases were given. It was impossible to have any decided definition of poison if they were to accept the theory that in certain circumstances and in certain diseases to administer certain things was dangerous.

His Honour said, supposing he adopted Dr. Luff's statement, that if the whole bottle were taken at once by a child in ordinary health it would certainly be injurious and might be fatal, Mr. Bonsey, he supposed, would say that that did not satisfy the point.

Mr. Bonsey said it was not satisfactory, because such a statement would apply equally to a medicine prescribed by a doctor. Therefore it was the same thing over again. They must look at the intention and object of the Act—the protection of the public. He submitted that this was where the difficulty arose, and as he had said, the only definition of poison intended by the Act was that which was given in all the English dictionaries—a thing which when taken was injurious or fatal to life. Again, therefore, it came back to the question of quantity. He submitted that where they had a thing from which no fatal or injurious effect had been known to result, where they had a dose prescribed, at any rate perfectly safe and reasonable, there was good reason why they should say that the Act did not apply. He would refer his Honour to the British Pharmacopœia—a book compiled by the Medical Council under an Act of Parliament for the guidance of medical men and chemists, and there they had a limit stated from one-eighth to one-half a grain of morphine as a dose. In that case they had a maximum less than the smallest quantity given in the British Pharmacopœia, and it was rather a straining of the point to say that, even in the ordinary sense of the term, and from a medical man's point of view, one-tenth of a grain of morphine should be considered a poison. Poisons were often administered medicinally, and were not poisonous. Morphine was a poison which came within that description. It might be said, as it had been said, that it depended on the person to whom it was administered, but after all it came back, in every case, to the question of quantity. Summarising his case, he said that in the first place the law as it stood had left the point open. Then, if they looked at the object of the Act they would see that it was the safety of the public: in his view the public were not protected, and would not be protected if the plaintiffs secured a verdict in that case, because it would not make any difference at all whether a chemist or a grocer sold the preparation. If they were driven to the consideration whether the thing itself was a poison in its entirety, the difficulty arose of getting a proper definition of poison. The preparation in question was not a thing which was taken in its entirety under ordinary circumstances, and it could not be pretended that it would be fatal if taken as prescribed.

His Honour: I suppose you say that the thing taken under ordinary circumstances is not poison?

Mr. Bonsey: I say it is not, in the ordinary sense of the term, a poison. When we talk of poisons we mean things that kill.

His Honour: A thing, the natural result of which would be fatal.

Mr. Bonsey: Yes. If it is merely to be said that the thing is injurious, how can you give a reasonable definition. You may administer morphine, and it may, in some instances, have beneficial effects, and if it is given to a child it may be injurious, though it may not be fatal. It might be, Mr. Bonsey went on to say, injurious if a child was suffering from a certain disease, but in another disease it might be beneficial. It was necessary to go further than had been gone in that case, and to say that where a child was suffering from a disease for which it was a remedy or not, the effect would be to kill or injure the child. They had not done that. The maximum quantity to be given, it could not be pretended, would kill an adult, though it might under extreme circumstances. Supposing they found a man at the point of death from Bright's disease. The mixture might kill him, but so might other things. That argument would apply to a great many things which were not poisons. It was not fair to say that because this compound would kill such a man therefore it was a poison. That was not the kind of interpretation which it was intended the Act should bear. The proper view to take was what effect would it have on ordinary people.

His Honour: Would you exclude infants?

Mr. Bonsey replied that he would exclude a child of a day or two old. The danger to the public was more with regard to adults than children, because these mixtures were only administered to children by nurses or parents, and accidents were therefore not so likely to arise in their case. That matter was one of very considerable importance to many people, because if the word poison was to have such a wide definition, and if the Act were to have such a wide application, it would apply to innumerable medicines which were useful for common ailments. Many people went to shops and bought things of that description, and if the attempt to bring all those things within the operation of the Act succeeded, the public would be affected most detrimentally, because it would be impossible for them to get those common remedies. The great difficulty in the way of the plaintiffs was that they must prove that particular preparation to be a poison within the meaning of the Act, and if they did not do that he was entitled to judgment.

### ADDRESS OF COUNSEL FOR THE PLAINTIFFS.

Mr. Grey, in reply, said that in this case they were bound entirely by the Act of Parliament. The object of the Act had been laid down by Mr. Justice Mellor (L. R. 4 Q. B., 313). It was to absolutely restrict the sale of poisons, or to limit it to certain people who were accustomed to use poisons, and it was proper that they only should compound and sell them; and even when these people compounded and sold them they had to do so under certain restrictions. With regard to the definition of poison, he challenged Mr. Bonsey to bring any dictionary which gave his definition. He had said that the substance must be fatal.

Mr. Bonsey: Injurious, I said.

His Honour: He did not go so far as to say that it must be of necessity fatal.

Mr. Grey said that Lord Coleridge had found the proper definition—"that which, when administered, is injurious to health or life;" and Mr. Justice Field had added, that "if it is a recognised poison, the quantity does not matter." If they acted upon that definition of poison he was well within it.

His Honour: That is what we have to go on. But in the Delve case the evidence distinctly showed that poison was one of the ingredients, and the judges held that it was not in sufficient quantity to justify a verdict for the plaintiffs.

Mr. Grey: The analyst found morphine, but did not ascertain the quantity, and the county court judge said that he was not satisfied with the evidence.

His Honour: What was said was that the judge did not think there was a sufficient quantity.

Mr. Grey: There was no quantity in that case. Here there is quantity.

His Honour: According to that it was an immaterial finding.

Mr. Grey: I do not say that the Delve case is not against me in a way, but it is not against me in this case.

His Honour: It is not conclusive against you; it is only an authority against you on the point that inasmuch as there is morphine here, and as that morphine is a poison, therefore you are entitled to recover your penalty. But it goes back on the question whether the whole proportion taken altogether falls within the definition of poison or not.

Mr. Grey: I say it does not go so far as that.

His Honour: I do not see the halting place.

Mr. Grey referred again to the decision of Mr. Justice Collins, and went on to say that whatever view his Honour took of the case of Delve, this was an entirely different case, because here they had evidence by Dr. Paul, who was a special analyst, and occupied most of his time in analysing, and had found not that there was an infinitesimal quantity of poison, but that there was one-tenth of a grain, which was an appreciable amount. And the evidence before his Honour was not only that morphine was a dangerous poison to an adult, but that it probably would be fatal in some cases. Witnesses on behalf of both the plaintiffs and the defendant had given evidence to that effect.

His Honour: There is not much difference between the evidence of the witnesses on each side.

Mr. Grey said that according to his friend's argument he did not care what happened to infants, but it was not clear where he drew the line. The Act could not have meant anybody to define the difference. If a poison was fatal to an infant it could not be said that it was not poison because it was not fatal to a boy of sixteen. Directly they got to that point it was impossible for poison to be defined at all. The Act laid down a specific definition, and these poisons were not to be dealt with at all except by people who were acquainted with them: nobody who was unacquainted with them was to touch them. If they once begun to hold that unregistered and ignorant people might sell poison containing one-tenth of a grain of morphine because they had no evidence that it had killed an adult or a child, as the case might be, then they would be straining the law altogether. They wanted it laid down what the law really was.

His Honour: It seems to me at present that you will have to carry it to a court of appeal ultimately.

Mr. Grey said he was afraid it would be so. The first case was the chlorodyne case, in which proceedings were instituted by the Treasury, and the Society had been called upon to carry out these actions to see that proprietary medicines were not sold except by qualified people who knew that they contained poisons.

Mr. Bonsey: Chemists do not know that.

Mr. Grey replied that they did. A chemist in his examination had to be able to analyse and detect poisons, and as Mr. Justice Lawrance had pointed out, he had to be able to analyse preparations, and if there was a poison they ought to come under the regulations of the Act as set out in section 17. A man who was not a chemist could not do that. He pointed out to his Honour the danger of an indiscriminate sale of these remedies. People went and bought them, and took them, and did not know what was in them, and they took more than the dose set down, and often serious effects followed. Therefore, if his Honour held that day that a person could sell a substance containing one-tenth of a grain of morphine, it would allow ignorant people to buy poisons wholesale in large quantities, and to measure them out as they thought in one-tenth grains in each bottle, which would come just within the Act. But very few people could do this; very few knew how to analyse and weigh and measure such things, but everybody would do it, and bottles would be sold retail containing these poisons supposed to be one-tenth of a grain, but in reality no one would know what was there until the analysis was made, and thus might find that fatal results would follow. The danger with regard to such things would be enormous. There would be no stopping the sale of poisons at all. If a person could buy one bottle, there was no reason why he could not buy two, or three, and thus get enough poison for anything.

His Honour: That is an argument in favour of the Act being extended to anything which contains any poison at all.

Mr. Grey said that if it were held any person could sell proprietary medicines containing one-tenth of a grain of morphine, it could be sold without a label, and nobody would know what it was. He submitted on the facts, and on the evidence as given both by the plaintiffs and the defendant, he was entitled to a verdict.

### REMARKS BY THE JUDGE.

His Honour said that this was a most important case, and he thought it would be much better for him to give his judgment in writing. It was sought to find really whether the law could be made to lay down a strict definition of the points raised, and he felt that he ought not to come to a decision until he had thoroughly considered the evidence and the law. It was essential that matters of fact and of law should be kept entirely separate. He would, therefore, reserve his judgment.

Mr. Bonsey intimated that whichever way the verdict went it was probable that the case would be taken to appeal, if his Honour would grant a case.

His Honour said at once that he would give leave to appeal on whichever side his judgment might go.

### INLAND REVENUE PROSECUTION.

At Heywood, on Wednesday last, John Birch, chemist, York Street, was summoned for selling extract of malt and cod liver oil, a preparation to be used and applied as medicine, and alleged to be liable to stamp duty.—Mr. Squires, from the legal department of Somerset House, conducted the prosecution. The defence was that the preparation was a food, and in consequence was not liable to stamp duty. The hearing of the case occupied a considerable time, but in the result the Bench held that the preparation was liable to duty, and they inflicted a small fine.—*Morning Advertiser.*

### ACCIDENT WITH CHLORATE OF POTASH LOZENGES

A lad named Phillips, living at Carrom Road, Clapham, and employed at Messrs. Farmiloe's establishment at Westminster, has been the victim of an accident probably unique of its kind. In his pocket he had some chlorate of potash lozenges and some safety matches. The lozenges touched the safety matches and caused a slight explosion. At the same time the lad's clothing caught fire, and he was rather severely burned. Dr. Leftwich, by whom he was attended, declares him to be now out of danger.—*Daily News.*

### EXCISE PROSECUTION.

At the Sunderland Borough Police Court, on February 9, before Mr. Ralph Simey (Chairman), Mr. T. Steel, Mr. W. Sanderson, and Mr. A. T. Crow, Ernest A. Hay, chemist and druggist, 13, Hylton Road, was summoned at the instance of the Inland Revenue Department for an infraction of the Spirits Act, 1880, by selling liniment of iodine prepared with methylated spirit, and capable of being used internally as a medicine.

Mr. J. T. Squire (London) appeared for the prosecution, and Mr. C. R. Walker defended.

Mr. Squire said that on November 18 last two Inland Revenue officers were in Sunderland, and, among others, visited defendant's shop in Hylton Road, and asked him to produce his liniment of iodine. He produced a small bottle containing about four or five ounces, marked "Liniment of iodine meth." It was taken possession of and examined by the analysts at Somerset House, London, when it was found to have been prepared with methylated spirit. The defendant said at the time that it was prepared two years ago, and that he had sold only an ounce, as it was intended for external use. He was perfectly candid about it, and said he was not aware that he had broken the law. An analyst would tell the Bench that the liniment of iodine was a preparation five times the strength of tincture of iodine, and there was the addition of glycerin, but that would not prevent the preparation from being used internally as a medicine.

Mr. Walker admitted that the preparation contained methylated spirit, but said his point was that it was not a medicine capable of being used internally. The statute was a penal one, and must be construed strictly. He submitted that no case had been really made out, because it was not an offence to use methylated spirit in any article which was not capable of being used as a medicine internally; this would have a dangerous effect if taken. He also submitted that if the offence were proved the defendant was not aware that it was an offence to use methylated spirit in the preparation of the iodine.

The Bench intimated that it was not necessary to hear further evidence, and then retired to consider the matter. On returning to court, Mr. Simey said the defendant had committed a breach of the Act of Parliament, but under the circumstances they were not disposed to deal harshly with him, and he would be fined 20s. and the costs of the court.—*Sunderland Daily Echo.*

## Notices of Meetings next Week.

MONDAY, FEBRUARY 19.

*Imperial Institute*, at 8 p.m.
"Some Features of Home and Colonial Bird Life," by Dr. Bowdler Sharpe.

*Society of Arts*, at 8 p.m.
"The Detection and Measurement of Inflammable Gas and Vapour in the Air" (fourth lecture), by Professor Frank Clowes.

TUESDAY, FEBRUARY 20.

*Sheffield Microscopical Society*, at 8 p.m.
Lecture by Dr. A. J. Hall.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (sixth lecture), by Professor C. Stewart.

*Society of Arts*, at 8 p.m.
"Belgian Industry and the Antwerp Exhibition, 1894," by Edouard Sève.

WEDNESDAY, FEBRUARY 21.

*Royal Microscopical Society*, at 8 p.m.
"Fucitrogus Rhoydymeniæ, a gall-producing Copepod," by Professor G. S. Brady.

*Edinburgh Pharmacy Athletic Club*, at 8 p.m.
Smoking Concert at Café Royal, West Register Street.

*Western Chemists' Association (of London)*, at 9 p.m.
"Federation of Local Pharmaceutical Associations." Adjourned discussion, at the Westbourne Restaurant, Craven Road.

*Society of Arts*, at 8 p.m.
"Electric Signalling without Wires," by W. H. Preece.

*Pharmaceutical Football Club*, at 6.45 p.m.
Annual Dinner at the Holborn Restaurant.

THURSDAY, FEBRUARY 22.

*Royal Institution*, at 3 p.m.
"Mountain Exploration" (third lecture), by W. M. Conway.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Animal Extracts as Therapeutic Agents," by F. C. Larkin.

*Chemists' Assistants' Association*, at 8.30 p.m.
"Poisonous and Infected Foods," by Dr. A. P. Luff.

FRIDAY, FEBRUARY 23.

*Royal Institution*, at 9 p.m.
"Transformation of Electric Currents," by Professor S. P. Thompson.

SATURDAY, FEBRUARY 24.

*Royal Institution*, at 3 p.m.
"Light" (third lecture), by Lord Rayleigh.

*Pharmaceutical Football Club* v. Circle Wanderers at Shepherd's Bush at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Carter, Dinwiddie, Grose, Kinninmont, Mitchell, Mumbray, Sage.

## ARSENIC IN GLYCERIN.

BY DR. B. H. PAUL AND A. J. COWNLEY.

The presence of arsenic in glycerin has been on several occasions a source of alarm, and the probability that the method of manufacture adopted in the production of glycerin may in some instance give rise to impregnation with more or less arsenic is sufficient to give importance to the subject. Quite recently it has been stated by Mr. Fairley, the public analyst for Leeds, that he has found appreciable amounts of arsenic in the glycerin of commerce. We have, therefore, obtained several samples of glycerin and examined them for arsenic, with the results stated in the accompanying table:—

| Sample No. | Result of Test applied to the glycerin (1 C.c.) direct. | Result of Test applied after destroying sulphur compounds by Iodine. | Fraction of a milligramme of metallic arsenic in 1 C.c. of glycerin. |
|---|---|---|---|
| 1. | Stain in 10 mins. | Stain as before | |
| 2. | „ 16 hours. | „ „ | ·01 |
| 3. | „ 16 „ | No stain in 16 hrs. | — |
| 4. | No stain in 16 hours. | —— | — |
| 5. | Slight stain in 16 hours. | No stain in 16 hrs. | — |
| 6. | Slight stain in 1½ hours. | Slight stain in 16 hours. | ·001 |
| 7. | Slight stain in 1½ hours. | Slight stain in 16 hours. | ·001 |
| 8. | Stain in 30 mins. | Stain as before. | ·01 |

The samples examined were less numerous than we intended, owing to some promised supplies not having been received, but those above referred to represent the produce of several makers, and it will be seen that, with the exception of No. 1, the amount of arsenic was never sufficient to be a cause of apprehension, while in three of the eight samples there was no indication of the presence of arsenic. The sample No. 1 was of a character not likely to be met with in ordinary retail trade, being, in fact, the crude material used in the manufacture of nitroglycerin. The largest quantity found in the samples Nos. 2 and 8 amounted to only one grain of metallic arsenic in fourteen pounds of glycerin.

It appears, therefore, that with the exercise of due care in applying the test above described, there is really no difficulty in obtaining glycerin practically free from dangerous contamination with arsenic. But it is desirable that this point should be determined by applying the test in all cases.

The ordinary form of Marsh's test is inapplicable for the detection of minute quantities of arsenic, and with all but one of the samples examined we failed to obtain satisfactory indications of the presence of arsenic in the glycerin, which was subsequently found to contain it.

The method of testing employed for this purpose was a modification of that introduced by Gutzeit, which consists in allowing the gas slowly evolved from sulphuric acid and zinc, in contact with the liquid supposed to contain arsenic, to act upon filter paper moistened with a saturated solution of argentic nitrate and placed over the mouth of the test tube in which the reaction takes place. If arsenic is present, arsenietted hydrogen is formed, and a yellow stain is produced upon the filter paper. For application to glycerin this test has been modified by Vulpius, Flückiger, and Siebold. Hydrochloric acid is substituted in place of sulphuric, and mercuric chloride is used instead of argentic nitrate. A mixture of two cubic centimetres of the glycerin to be tested with 5 C.c. of hydrochloric acid (1 to 7) and 1 gramme of pure zinc is placed in a long test tube, the mouth of which is covered with a disc of filter paper previously moistened with one or two drops of mercuric chloride solution and then dried. If arsenic be present in any considerable amount a yellow stain is produced upon the filter paper after a few minutes, and it subsequently becomes darker. When the amount of arsenic is very minute it is necessary to allow the action to continue for a longer time. Fifteen minutes is considered by Mr. Siebold sufficient for practical purposes, and if no stain is produced in that time the glycerin may be regarded as free from arsenic. But though extremely small quantities, such as $\frac{1}{100}$ or $\frac{1}{1000}$th of a milligramme of arsenic, are indicated by this test, we think it is preferable to allow a longer time to elapse in testing.

If the samples examined can be taken as similar to the glycerin generally met with, it would appear that in regard to the amount of arsenic there has been a great improvement since 1890, when Mr. Siebold's paper was published. He then found 1 part in 6000 or 4000, and even more, whereas the arsenic in samples Nos. 2 and 8 amounts to only one part in one hundred thousand, and that in the samples Nos. 6 and 7 to only one part in a million.

The circumstance that zinc frequently contains a trace of sulphur which would be eliminated, by the action of acid, in the state of sulphuretted hydrogen, may exercise a disturbing influence in the application of the test. In such a case the quantity of sulphuretted hydrogen will generally be so small that it does not produce a black spot on the filter paper impregnated with mercuric chloride, but a spot having almost the same colour as that produced by arsenietted hydrogen. In this way a sample of glycerin that is perfectly free from arsenic may appear to be contaminated.

For this reason it is always advisable to repeat the experiment, adding to the mixture before the zinc is put in, some starch mucilage and a small quantity of iodine solution until a blue tinge is produced. In this way the formation of sulphuretted hydrogen is counteracted. Mr. Siebold[*] has, however, pointed out that the use of iodine for this purpose requires caution, for if too much iodine is added for the destruction of sulphur compounds it interferes with the reaction, and may lead to erroneous conclusions.

In every instance it is of course desirable in testing glycerin for arsenic to make a blank experiment, so as to be absolutely certain that neither the hydrochloric acid nor the zinc employed contains any trace of arsenic.

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[*] *Pharm. Journ.*, [3], xx., p. 682.

## THE PRESERVATION OF INFUSIONS.*

BY EDMUND WHITE, B.SC.

The preservation of infusions, in common with other organic fluids, is dependent upon the exclusion of various organisms—chiefly moulds and bacteria. The preservative action of alcohol is due to its inhibitory action on the life processes of any organisms which may gain access: that is to say, alcohol is an antiseptic. The addition of alcohol or other antiseptic is attended with disadvantages so obvious as to need no mention here. It has always seemed to me that there was ample room for the application in pharmacy of the comparatively recent results of biological research. Thus it is a simple matter for the bacteriologist to preserve for all time his culture media, which, under ordinary conditions, rapidly putrefy. It is also a well-established fact that an organic fluid once sterilised will remain unchanged if protected from the access of fresh organisms. The result of some experiments in this direction I now publish.

### *Preservation of Infusions without the Addition of Antiseptics.*

In November, 1892, some infusion of gentian was made. An 8-oz. flask (A), containing 2 ozs. distilled water, was then boiled for ten minutes, and some of the infusion strained into it after turning out the residual water. The neck was instantly plugged with sterilised cotton wool and the flask set aside. The infusion remained good for five weeks, and then some filamentous mould appeared. Immediately this was observed, the contents of the flask were raised to the boiling point and the mould destroyed. The infusion has remained unchanged ever since.

Another flask (B) was filled at the same time, November, 1892. It was thoroughly washed, some fresh infusion of gentian placed in it, the neck being plugged with cotton wool. After bringing the infusion to the boiling point and continuing the ebullition one minute, the flask was set aside, the cotton wool plug being heated in the flame till it singed slightly, in order to completely sterilise it. This infusion has remained absolutely unchanged for fifteen months, and has been examined for bacteria at intervals, with negative results.

Some infusion of ergot was made on January 29 last, the flask (C) being previously sterilised by boiling water in it immediately before pouring in the infusion. The contents are therefore seventeen days old, and have shown no sign of decomposition. A further quantity of infusion of ergot was made on January 29 last, but the infusion was boiled after introduction to the flask (D). This also remains unchanged.

Other flasks (E and F) contain infusion of buchu, the manipulation being the same as for flasks C and D respectively. The results are the same also.

Infusion of calumba made twelve days ago has been sterilised by filtration through a kieselguhr block of the Berkefeld Filter Co., and received directly into a flask (G), which had been just previously sterilised by boiling distilled water in it. The filtering block and its connections were boiled in water just before filtration, the neck of the flask being afterwards plugged with sterilised cotton wool as in the other experiments. Some infusion of calumba was filtered in the same way and at the same time as that in G, into a flask (H) cleaned in the ordinary way only, and not sterilised by boiling water. The result is entirely different. After three days a faint turbidity appeared, which has continually increased, until now the infusion is absolutely putrid. The difference between the two experiments G and H was that flask G was sterilised and H was simply cleaned under the tap.

These experiments show, I think, that the pharmacist may do a great deal towards the abolition of the so-called concentrated infusion. For instance, a quantity of freshly made infusion may be filled into flasks of convenient size, the flasks having been previously sterilised in the manner described, and the necks immediately plugged with cotton wool recently heated to 120°–150° C., say, in an ordinary kitchen oven. It would probably be safer to raise the contents of the flasks to the boiling point before putting them aside, but unless they are required to be kept a long period this will be unnecessary. Any loss of aroma through the cotton wool plug may easily be prevented by placing a rubber cap, such as is used for bacteriological purposes, over the mouth of the flask.

The method by filtration through kieselguhr gives more trouble, but it enables one to present infusion of calumba or quassia in exactly the condition required by the Pharmacopœia, the application of heat being quite unnecessary if the filtration be properly carried out.

In place of preserving the infusion in a series of small flasks, one larger one may be employed, like the one illustrated. It has a well-fitting rubber stopper pierced with two holes, through one of which passes a thistle funnel plugged with sterilised cotton wool, and terminating just inside the stopper. The end is constricted to a narrow orifice to prevent the infusion wetting the wool when the flask is turned up, or a simple valve made from rubber tubing may be attached. The other hole receives a tube bent downwards and six or eight inches long, terminating likewise just inside the stopper. A few ounces of water is first placed in the flask and boiled for ten minutes. The residual water is then turned out and replaced by the fresh infusion. Whether it is necessary to raise the contents to the boiling point after introduction will depend partly on the nature of the infusion, and still more on the care which has been exercised in preparing the flask and infusion. When any of the infusion is required it is simply necessary to turn up the flask and let it run out of the bent delivery tube, air flowing into the flask, to replace the liquid poured out, through the cotton wool plug in the thistle funnel. The entrance of organisms is thus prevented. For extra safety the open end of the delivery tube when not in use may be closed with a piece of rubber tubing and a clip. I have several times filled a flask of this kind with some infusion and poured out a few ounces daily, just as if

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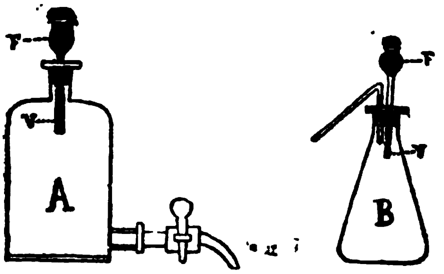
[*] Paper read before the Chemists' Assistants' Association, on Thursday, February 15.

it were required for dispensing purposes. The infusion has always remained good till the end.



VESSELS FOR STORING INFUSIONS.

A. Stock bottle. B. Flask for dispensing purposes; v. rubber valve; F. thistle-funnel, filled with cotton wool.

I have followed a similar plan in the case of infusions—say buchu—where about two gallons is required every week. A bottle provided with a tubulure at the bottom, through which passes a glass tap or tube and clip, and holding a little over two gallons, is thoroughly cleansed and then rinsed several times with freshly boiled and cooled distilled water. The infusion is placed in the bottle and its mouth closed by a good cork, through which a thistle funnel, plugged with cotton wool, passes, in order to admit air as the contents are drawn off. It is by this means easy to keep an infusion from two to four weeks, which would go bad in as many days if stored without these precautions.

The conclusions to which these experiments lead are as follows:—

1. An infusion prepared with boiling water is sterile when perfectly fresh, if care be taken to avoid unnecessary exposure.

2. The infusion so prepared may be kept sterile in a flask in which water has been recently boiled.

3. Raising the contents of the flask to the boiling point after plugging renders their preservation more certain.

4. Cold infusions may be sterilised by filtration through kieselguhr blocks.

### *Preservation of Infusions by the Addition of Antiseptics.*

The addition of antiseptics to ordinary infusions is, of course, inadmissible, but the so-called concentrated infusions usually contain 15 or 20 per cent. of rectified spirit. The two chief objections to this addition are (1) the cost of the alcohol, and (2) the alteration in physical character which is produced by its addition. In several discussions on the preservation of infusions and fluid extracts, chloroform has been mentioned, but generally dismissed as altogether without the pale of discussion. This, I venture to think, is a great mistake. For instance, I produce a concentrated infusion of senega, preserved by the addition of 1 in 400 by volume of chloroform. Fluid extracts may be preserved equally well without the use of alcohol. One fluid drachm contains, therefore, one-seventh of a minim of chloroform, a quantity surely too small for any objection to be raised to its presence. If the infusion contained alcohol as a preservative the same dose would probably be equal to fifteen minims of rectified spirit. The diluted chloroformed infusion would contain 1 in 3200 of chloroform, equal to half drachm of chloroform water in one ounce. This amount of chloroform has a very slight taste even in plain water, and in presence of other flavours becomes practically indistinguishable. Moreover, the addition of 1 in 400 of chloroform produces no precipitate, and no change in the physical appearance of the fluid, such as follows the addition of 15 or 20 per cent. of rectified spirit. The relative cost of chloroform and rectified spirit when used in the proportions I have mentioned is about 1 to 80, if 20 per cent. of rectified spirit be used. In using chloroform the greatest care must be taken to prevent any contamination or incipient decomposition before the addition of the preservative to the finished product. Where admissible, it is a good plan to raise the finished fluid to the boiling point in order to sterilise it, and then add the chloroform as soon as it is cold.

My own experience has proved that chloroform might advantageously replace alcohol as a preservative in many pharmaceutical preparations.

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## DETERMINATION OF THE AMOUNT OF ALKALOID IN IPECACUANHA.

G. C. Keller describes two modifications of the process formerly recommended by him. The drug is first dried, but need not be very finely powdered.

Method A.—The fat is removed from 12 grammes of the drug by percolating with about 100 C.c. of ether, the residue then digested with a mixture of 90 grammes ether and 30 grammes of chloroform, adding after five minutes 10 C.c. of 10 per cent. ammonia solution. After shaking well for half an hour, water (10 C.c.) is added, and the shaking repeated for two or three minutes. 100 C.c. of the clear solution is then decanted off, the ether and chloroform evaporated, the residue twice treated with a small quantity of ether to remove the last traces of chlorophyll, then dried in a water oven, weighed, and titrated.

Method B.—The separation of the fat is omitted, and the drug at once treated with ether, chloroform and ammonia. 100 C.c. of the clear alkaloid solution is then shaken with 1 per cent. hydrochloric acid three times in succession; the acid solution is mixed with ammonia in excess, and shaken twice with 50 C.c. of a mixture of chloroform (3) and ether (2), the alkaloid solution being evaporated, the residue weighed and titrated as in the former case.

The examination of 11 samples gave the following results:—

| | | Weighed. | Titrated. |
|---|---|---|---|
| 1*a*. | Best Rio ipecacuanha ............... | 3·0 | 2·921 |
| 1*b*. | „ „ „ ............... | 3·040 | 2·946 |
| 2. | Powdered Rad. ipec. sine legno... | 2·790 | 2·692 |
| 3. | Rio ipecacuanha ..................... | 2·063 | 2·057 |
| 4. | „ „ ..................... | 2·122 | 2·1082 |
| 5. | „ „ much wood and stalk | 1·930 | 1·816 |
| 6. | Powdered drug ........................ | 2·730 | 2·641 |
| 7. | Rio ipecacuanha ..... ............ | 2·910 | 2·895 |
| 8. | Carthagena „ ..................... | 2·950 | 2·921 |
| 9. | Rio „ ..................... | 2·840 | 2·717 |
| 10. | Carthagena ipecacuanha........... | 2·050 | 2·032 |
| 11. | „ „ ........... | 1·610 | 1·575 |

From these data Keller infers that ipecacuanha of the best quality should not contain less than 2·5 per cent. of alkaloid. He finds that while the cortical portion of the root contains nearly 3 per cent. of alkaloid, the woody portion does not contain much more than 0·5 per cent., and he advocates the separation of the central woody portion of the root in the grinding.—*Schweitz. Wochenschr. f. Pharm.*, 1893, p. 470.

## EXPORTATION OF TINCTURES AND PERFUMED SPIRITS.

A General Order was published by the Inland Revenue Department, on February 10, directing the attention of officers of the Department to the following matters:—

### (1) Exportation of Tinctures.

1. Tinctures made by licensed rectifiers and compounders may be exported on drawback, by weight or by measure, in iron drums, ranging in size from 2 to 10 gallons, and such drums need not be packed in cases. They may also be exported, by weight or by measure, in earthenware jars, ranging in size from 1 to 5 gallons, provided the jars be placed in cases.

2. No case shall contain less than two gallons, and any internal package larger than half a gallon shall contain not less than one gallon, two gallons, etc., or 8 lbs., 16 lbs., etc.

3. Decimal fractions are to be shown in the Schedule of the Notice when the exportation is according to weight. The weight per gallon and the bulk quantity should be shown to two decimal places, and the proof to three decimal places. This rule as regards proof is also to apply to quantities shown by measure.

4. When the weight per gallon as ascertained at the laboratory, taking the average as in the case of strengths, does not exceed the declared weight by more than a tenth of a pound, the declared weight may be passed as correct. When, however, the average excess is greater than one-tenth of a pound, special directions as to the basis of calculation will be issued by the Board.

5. When tinctures are exported by measure, officers are to check the contents of bottles by seeing not fewer than one in twenty emptied into a suitable and stamped Imperial measure provided by the exporter; and, if jars or drums be used, one in every five must be checked.

6. If the exportation be conducted by weight, the quantity in the bottles, jars, or drums must be checked in the same proportions, by measure or by weight, as may be most convenient to the exporter.

7. When the results obtained do not afford practical agreement with the quantities shown by the exporter, additional bottles or other vessels should be checked, and the result noted in the Export Notice, for the consideration of the Board.

### (2) Perfumed Spirits.

1. Paragraph 511 of the Licence and Cautionary Instructions is modified so far as to allow drawback on Toilet Vinegars and Waters, Dentifrices, Hair Washes, Brilliantines, according to the quantity of proof spirits actually present, whether the strength can be ascertained by the hydrometer or not.

2. In cases where the strength of such articles, as checked by the hydrometer, is found to be more than two degrees below the strength declared by the exporter, samples should be forwarded to the laboratory in the usual way, for the true strength to be ascertained by distillation.

## GLYCERIN SUPPOSITORIES.*

### BY L. A. HARDING, B.SC., PH.D.

Chemically speaking, glycerin suppositories consist of soap with glycerin as their active ingredient. Of the many processes in vogue for their manufacture, none offers such an elegant product, handsome in appearance, and so free from objection as that in which stearin is used. By this method it is possible to make a very firm and perfectly transparent product, which will contain ninety-five per cent. of glycerin. I will first give its component formula, and then point out some of the points which it is necessary to observe to insure good results and a creditable product.

| | |
|---|---|
| Stearic acid ............ | 2½ drachms. |
| Sodium carb............ | 1 dram. and 15 grains. |
| Glycerin ............... | 5 ounces. |

Heat the glycerin and stearic acid together, regulating the temperature so as to just melt the stearic acid; when dissolved, stir so as to perfectly mix the mass, then add the carbonate of soda to the mixture, and when dissolved, pour into suitable mould to cool. The product of the above formula should, if left to cool in the evaporating dish, present a perfectly transparent solid, and suppositories made from it should show the same physical characteristics. They will then contain about ninety-five per cent. of glycerin. Should the mass, however, upon cooling, present an opaque appearance, the fault may be looked for in two directions. In the first place, the amount of sodium carbonate may be deficient on account of the stearic acid of commerce. In this case, carbonate of sodium should be added. The necessity of adding carbonate of sodium may be recognised by the fact that they are opaque in colour, and soft to the touch, somewhat of a lardy consistency; the carbonate of sodium should be added, a small quantity at a time, until the desired result is obtained. Should, however, the product be opaque and very firm, glycerin is wanting, and should be added until a perfectly clear product is the result. It must further be observed not to use a high degree of heat, not any higher than is absolutely necessary to dissolve the stearin, as otherwise a white foam will rise to the surface, which it is necessary to remove from the clear underlying solution. While this does not interfere with the product itself, it will increase the cost of the resulting product; just as much as there is foam to be removed, precisely the same amount of product is lost, whence the increased cost of the remainder.—*American Druggist.*

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* Read at the recent meeting of the Minnesota Pharmaceutical Association.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, FEBRUARY 24, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE REGISTRAR'S REPORT.

As the present number of the Journal will be sent to every chemist and druggist on the Register, we have deferred until this week any reference to the data indicating the numerical condition of the trade and its relation to the Society. The opportunity of bringing these facts under the notice of chemists and druggists throughout the kingdom appeared to be very appropriate, since the subject of federation is now receiving attention in various quarters, and some progress is being made towards a more general appreciation of its practical importance.

At the last meeting of the Council the usual report of the Registrar was presented, setting forth the statistics of the several grades of persons registered under the Pharmacy Act, and the changes which took place in the year ending in December last. From that report it appears that during the past year the number of names erased from the Register was 219, chiefly in consequence of deaths, while the number added was 497, so that the number of persons on the Register has been increased by 278, or to a total of 14,798.

Of the 14,798 persons on the Register at the present time, 2,236 are pharmaceutical chemists, showing an increase in that grade of 31, while the increase in the number of chemists and druggists is 247, or nearly eight times as many. Of the total number of registered persons 4,812 are connected with the Pharmaceutical Society—1,638 as pharmaceutical chemist members, 612 as chemist and druggist members, 1,567 as associates in business, and 995 as associates not in business on their own account—the total increase of the strength of the Society in all grades being 16. The number of members of both grades is somewhat less than at the end of 1892, and the increase has been entirely in the grade of associates in business, of whom there are 110 more than last year. Relatively to the total number of registered persons, the strength of the Society is still somewhat less than one-third of the whole. The rate of growth shown in the two previous years has not been maintained, but as compared with the position existing in 1874—when the number of those connected with the Society was not much more than one-fourth the number of registered persons—there has been considerable improvement.

In regard to the state of internal organisation of the trade, the indications afforded by the Register are far from being satisfactory. From the numbers given above it will be seen that the position is practically the same as last year. Of the whole number of registered chemists, only fifteen per cent. are eligible to take part in the executive work of the Pharmaceutical Society, which is officially the representative of the trade, the body empowered to test the qualification of persons seeking registration, and the only medium through which action can be taken for improving the position of chemists and druggists, and to promote or oppose legislation affecting their business. It is even still more remarkable that only one-fourth of the number of registered chemists should have secured to themselves the power of influencing the election of members of the executive body, which is recognised by the Legislature as the official representative of the trade, and is entrusted with the administration of the Pharmacy Act. This deficiency of internal organisation is to a large extent due to the circumstance that very many of the chemists and druggists who were in business on their own account before the passing of the Pharmacy Act in 1868 have abstained from taking advantage of the opportunity then offered for consolidation of the trade. There are at the present time about four thousand who still maintain that position, and not more than about six hundred chemists who were in business before 1868 are now members of the Society. The recent abolition of the entrance fee on joining the Society has removed the obstacle that was alleged to have been the chief reason for this abstention, but the alteration made in the bye-laws for that purpose has not been attended by such an increase in the number of members as might have been expected. With regard to the majority of those members of the trade who were in business before 1868 it still remains necessary for local secretaries to point out the importance of supplementing their registration by association with the Society.

But there is another circumstance which stands in the way of association with the Society to which it is desirable to refer. Deducting from the total number of registered persons the four thousand chemists and druggists, unconnected with the Society, who were in business before 1868, and the 600 who are now members, there remain about 10,000, most of whom have become qualified by examination, and of these only 4,812, or about 48 per cent., are connected with the Society. Deducting from this number the 995 associates who have not the power of voting for members of Council, it will be seen that only some three-fourths of the above number (3,817) are in a position to influence the elections, and again deducting the 1,567 associates in business, it appears that less than one-half (2,250) are eligible as members of Council. This is a condition of considerable importance in connection with the internal organisation of the trade and the practical application of the principle of self-government, as contemplated by the Society's charter. It results from the adoption of a legal standard of pharmaceutical qualification different from that originally established on a voluntary basis by the Society, and the consequent increase in the number of those who, under the present constitution, are eligible only as associates of the Society, even when in business on their own account.

Experience shows that notwithstanding the existing disability connected with the grade of associate, a large number of those who have entered the business since 1868 join the Society on that footing. At the present time there are 2,562 associates and 2,250 members, while many of the registered chemists who have passed the qualifying examination and have not joined the Society are withheld from doing so, because they would not be in a position of equality with members, nor eligible as members of Council. This obstacle has long been recognised by the Council, and in several of the bills recently introduced into Parliament, provision was made for an alteration in the constitution of the Society, by which the existing disabilities of associates would be removed. The opinion has been expressed that it would be desirable to deal with this matter in a special Bill, and the arguments put forward in support of that course carry considerable weight. It does not appear that the position of pharmaceutical chemists would be interfered with by making all legally qualified chemists and druggists eligible as members of Council, and giving them the power of voting, while, at the same time, the change would be a reason for expecting valuable accessions to the Society and increased interest in its work.

## PHOTOGRAPHIC POISONS.

The *Pall Mall Gazette* directs attention to the fact that the rapid spread of photography as a popular pastime has been the means of largely increasing both the demand and the means of obtaining poisons. It is stated that the numerous dealers in photographic stores, all of whom stock chemicals, readily sell drugs of the deadliest nature in any quantity for which they may be asked. Many of these poisonous articles, though exceedingly dangerous to be handled, are not included in the poison schedule of the Pharmacy Act, and among these are mentioned pyrogallic acid, a new form of developer of secret composition, nitric acid, and fluoric acid, etc. It is suggested that all these articles should be added to the schedule.

But it is also stated that, in addition to the articles above named, photographic dealers sell corrosive sublimate, cyanide of potassium, and hydrocyanic acid. This is clearly an infringement of the Pharmacy Act and an illegal act, whether or not precautions are taken to label the articles poison or to ascertain that the persons purchasing them can be trusted. So far as these articles are concerned, there is no need for legislation to prevent their sale in the manner which the writer of the article stigmatises as scandalous. He appears, however, to be under the impression that the requirements of the Pharmacy Act apply only to chemists, and that there is no restriction of the sale of poisons by other persons. That supposition is indeed the only ground for the opinion expressed that the traffic in poisons, as a subject of the greatest public importance, stands in need of remedial legislation. On the contrary, the Pharmacy Act absolutely prohibits the sale of any of the articles enumerated in the schedule, by persons who are not registered under the Act. In any case of infringement of those provisions that is communicated to the Registrar of the Pharmaceutical Society prosecution is instituted. Only three weeks ago a case of the kind was tried at Liverpool, and a penalty inflicted for the sale of cyanide of potassium by a dealer in photographic materials.

As an instance of what are supposed to be the anomalies of the present law relating to poisons, it is stated that, while a chemist would refuse to supply hydrocyanic acid to an unknown person, it can be obtained by the pint from a chemical dealer's shop. But if that is the case, it is no proof of the anomalous nature of the law. It only shows that the law is broken, and the great difficulty is to discover the offenders. Although the Act was passed for the protection of the public against indiscriminate sale of poisons, it appears to be nobody's business to find out and report offences against it. In speaking of another case of the sale of poison the writer in the *Pall Mall Gazette* refers to "noxious patent medicines which contain chloral, morphine and other poisons" as being obtainable from "grocers, oilmen, drapers, and others without even a warning on the bottle as to the constituents of the nostrum." This, again, is a case of illegal practice, and such infringements of the Pharmacy Act are being prosecuted by the Pharmaceutical Society in all cases which are brought under its cognisance. Within the last twelve months upwards of 200 cases have been placed in the hands of the Solicitors. But the evil is very widespread, and it is frequently very difficult or even impossible to obtain the evidence requisite for instituting prosecutions.

## THE NEW PHARMACOPŒIA.

Now that it is definitely announced that instructions have been issued for preliminary arrangements to be made in connection with the publication of a new British Pharmacopœia, it appears desirable that pharmacists should consider in what directions the present work may be modified, so as to meet present requirements. It will probably not be regarded as desirable that pharmacists should suggest addition to, or omission from, the pharmacopœia, though any information they can furnish regarding the comparative extent to which certain articles are used will doubtless be welcomed. Medical practitioners may be expected to retain, and with good reason, the right to decide what drugs, chemicals, and preparations shall be included in the official list.

What pharmacists may do is, after careful investigation, to arrange the best formula for any given preparation. Their opinions will also probably be welcomed as to the simplest and most accurate ways of defining substances and testing them, whilst with regard to weights and measures and certain minor points careful attention is bound to be devoted to any suggestions they may make. Every chemist and druggist, assistant, and apprentice throughout the empire has it in his power to assist in shaping the new official guide, for even the most simple observation may be worthy of record in as great a degree, proportionately, as the most elaborate and finished research. The paper read by Mr. Lucas at the last evening meeting (*ante*, p. 665) affords very good evidence of this, consisting as it does of a record of numerous minor observations made during the progress of everyday work.

Whatever direction the activity of pharmacists may take, it is above all things desirable that they should publish no opinions or suggestions except after mature and careful deliberation, and then only with very complete experimental data to support the arguments adduced. The various pharmaceutical associations interested may profitably discuss the proposed work in every aspect in which it appeals directly to their members, but such discussions should be subsequent to individual consideration by the latter of the various problems involved. It is idle and futile to meet and discuss matters to which the speakers have not previously devoted careful attention at home; and it would be as rash for any body of pharmacists to confer unpreparedly on such, to them, vital matters, as it is for similar bodies to freely criticise a newly published pharmacopœia while the ink is scarcely dry on its pages. Neither criticism nor suggestion is of the slightest value unless founded on some substantial basis of fact, and it is to be hoped that pharmacists will, in this connection, propose nothing that is impolitic or indiscreet.

## THEORY AND PRACTICE IN PHARMACY.

In last week's Journal it was pointed out that in order to preserve their privileges from infringement, pharmacists must be content to confine themselves to their own proper duties, and apply the results of their scientific training in pharmaceutical practice, perfecting the outcome of their labours and fulfilling their duties to the utmost. The necessity of such a statement of the case at the present time is, unfortunately, emphasised by several incidents recorded in the present issue of the Journal. In the first place, a case is reported in which a registered chemist and druggist has been heavily fined for acting as an apothecary (see p. 700), the evidence clearly proving that the defendant, who described himself as a herbalist, acted in a manner that was distinctly unbecoming to the dignity of pharmacists. Then, in the course of a police prosecution under the Arsenic Act, it was stated—without contradiction and, there is reason to think, with some measure of truth—that registered chemists frequently sell arsenical sheep dips without registering the sales as required by law (see p. 701). Finally, a medical correspondent calls attention (see p. 704) to a rare instance of the members of his profession voluntarily and as a body relinquishing the practice of dispensing medicines, in the hope that counter prescribing in the district might also become a thing of the past. This hope, unfortunately, has not been realised. There seems to have been no unreasonable restriction of the pharmacists' business looked for, and, assuming the circumstances to have been as stated, it certainly appears ill-advised, to say the least, to abstain from giving full effect to a reciprocal arrangement, which ought to be implied even if not specified in definite terms. What pharmacists all over the country eagerly long for should not be despised because it is voluntarily offered.

## EVENING MEETING IN EDINBURGH.

An evening meeting of the Pharmaceutical Society will be held at 36, York Place, Edinburgh, on Wednesday next, February 28, at 8.30, when the chair will be taken by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch. The following communications will be read: "The Action of Papain on Egg and Serum Albumin in Acid and Alkaline Solutions," by Dr. Gordon Sharp; "The Crystals deposited in Liquor Strychninæ Hydrochloratis," by William Duncan; "Hints from the United States Pharmacopœia," by C. A. Macpherson; "Notes on some Galenical Preparations of the United States Pharmacopœia," by George Lunan; "The United States and British Pharmacopœial Assay Processes compared, and other Notes," by George Coull. The last three papers will introduce a discussion on the United States Pharmacopœia of 1890.

## PHARMACEUTICAL FOOTBALL CLUB.

The annual dinner of this club was held at the Holborn Restaurant, on Thursday evening last, when the chair was taken by Professor Attfield, who was supported by Mr. Michael Carteighe, President of the Pharmaceutical Society, Mr. Richard Bremridge, the Secretary and Registrar, and several of the Professors and other officers of the Society. As usual there was a well-arranged musical programme, and altogether the meeting proved an unqualified success.

## DEATH OF AN ANNUITANT.

We have to announce the death, on February 14 of James Pearce, aged 70, formerly of Wolverhampton, who was elected an annuitant on the Benevolent Fund in 1891.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, February 8, Mr. T. Tickle, Vice-President, in the chair.

A paper on "Iodine" was read by Mr. C. J. Taylor, who described the ways in which it occurred naturally, and gave the proportions in which it existed in various kinds of sea-weed. The methods formerly and at the present time employed for its extraction from sea-weed, and also the process employed in obtaining it from the South American nitrate beds were also described. The properties of the element and its compounds, especially the inorganic ones, were also discussed. The paper gave rise to a discussion, in which the Chairman, Secretary, Messrs. Hill and Potter took part.

A paper on the "Relation of the Chemist to the Medical Practitioner" was then read by Mr. E. J. Kitson, who discussed the questions of counter prescribing, the unauthorised repetition of prescriptions, prescribing proprietary preparations, etc. It gave rise to an animated discussion, in which the Chairman, Secretary, Messrs. Bryan, Browne, C. J. Taylor, T. Morley Taylor, Henry, Potter, Gaul, Cox, Crouch, Hill, and Lander joined.

A proposal brought forward by Mr. Potter that an evening should be devoted to impromptu speaking on pharmaceutical subjects was put to the meeting and negatived.

The meeting then adjourned.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, February 8, the President, Mr. E. F. Harrison, in the chair, a paper was read by Mr. H. T. Durrant, entitled "Solution." The subject was dealt with in a very comprehensive manner, and was followed by a discussion.

At the meeting held on Thursday, February 15, the chair was taken by the President, Mr. E. F. Harrison, and Mr. Edmund White, B.Sc., read a paper on "The Preservation of Infusions," which will be found at page 686. In the discussion which followed,

The President said Mr. White's paper had not only been an exceedingly interesting one, but would prove of great practical value. Pharmacists, as a rule, objected to concentrated infusions, but there was no getting over the fact that continually making fresh infusions was an inconvenience, which, however, Mr. White's practical suggestions did away with. Did Mr. White find that the temperature obtained when boiling water was poured on the drug, in making infusions—a temperature, of course, somewhat below that of boiling water—was sufficient to destroy all germs? In reference to the use of chloroform for preserving concentrated infusions, he was of opinion that although it might not precipitate matters which ought to be present, as when alcohol is added, the boiling and subsequent evaporation necessary for their preparation must cause the loss of some such matter and destruction of aroma, and they could not be recommended.

Mr. Eynon endorsed the author's opinion as to the value of chloroform as a preservative, and suggested that concentrated infusions should not be made of too great a strength. Infusion of calumba of a strength 1 in 2 was convenient, and one minim of chloroform to the ounce would preserve it; similarly with other infusions. If in any case the taste of chloroform was a disadvantage, gentle warmth would drive it off and so remedy it.

Mr. Dunning asked if Mr. White had tried his processes for the preservation of liquid extracts.

Mr. Bird said the paper supplied a long-felt want, as of all the means proposed for the preservation of infusions, it seemed to be the most successful and absolutely unobjectionable. The apparatus, too, was simple and ingenious, and the operations necessary easily conducted. Had Mr. White noticed any change in the aroma of any of the infusions which had been kept some time?

Messrs. W. A. Jones, Davies, and Roe having also taken part in the discussion,

Mr. White replied to the various questions and points raised. In making the infusion the temperature obtained by pouring boiling water on the drug would in nearly all cases destroy all the germs; a few seldom met with spores, however, would resist that temperature, but if his direction of raising the infusion to boiling point after its introduction into the sterilised flask were followed, there would be no doubt left as to whether or not the infusion was sterilised. He quite deprecated the use of concentrated infusions, but in some cases, as in the large hospitals, it was impossible to do without some of the rarer ones. For their preparation chloroform was to be recommended in preference to rectified spirit, as much on account of cheapness as in other respects. Infusion of calumba could be made for 4*d.* a pint that would cost 1*s.* a pint if made with spirit. Concentrated infusions were made better by continuous repercolation than by boiling and evaporating. If infusions were made weaker than 1 in 8, the same amount of chloroform would have to be used as a preservative, so that when diluted there would be more present. The non-absorbent cotton wool was the best to use for sterilising and keeping germs from the flasks; it could be sterilised by heating to 150° C.

Mr. Gane then proposed, and Mr. Bird seconded, a vote of thanks to Mr. White for his valuable paper, and the vote was carried with acclamation.

# Provincial Transactions.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

On Wednesday, January 31, 1894, a well-attended meeting of the council of the above Association was held at Mason College. Mr. C. Thompson, President, was unanimously appointed to represent the Association on the Executive Committee of the Federation of the local pharmaceutical associations.

A very long discussion then took place on the "company" question, at the conclusion of which the following resolution was carried unanimously:—

"That in view of the unsatisfactory method in which companies are formed for the purpose of carrying on the business of a chemist and druggist, this council is of opinion that steps should be taken to compel members of such companies to be qualified according to law, and further, that any registered chemist and druggist lending his qualification for the purpose of "covering" any unqualified person or persons should be struck off the register."

On Thursday, February 8, the second smoking concert was held at the Colonnade Hotel, and proved to be in every way a great success.

On Thursday, February 15, the usual evening meeting was held at the Mason College, Mr. R. D. Gibbs, Vice-President, in the chair. A paper was read entitled—

### LABORATORY NOTES.

BY JOHN BARCLAY, B.SC.

### 1. *Standards of Purity of Saffron.*

It recently came under my notice that a sample of pure saffron, supplied by a wholesale house to a retailer, had been condemned by a public analyst as containing "added mineral matter;" and since it has subsequently transpired that this condemnation was based on the alleged presence of 7 per cent. of ash (another analysis of one of the "three" samples gave 6·6 per cent.). The question at once arose whether the analyst's condemnation of the sample was due to the adoption of too high a standard by the Pharmacopœia, or to an erroneous interpretation of the official description of the drug. Further, it was noted that the samples of the saffron in question were, when taken by the Food and Drug Inspector, placed in ordinary (not parchment) paper envelopes, and that, in consequence, a considerable portion of the original moisture of the sample would be lost during the time when, previous to analysis, it lay in the analyst's laboratory. It appeared, therefore, that the somewhat high percentage of ash found might be to some extent attributable to this. For a sample of saffron containing 15 per cent. of moisture and 6 per cent. of ash would, if deprived of 5 per cent. of its moisture, contain 6·31; of 10 per cent., 6·66 per cent.; of all moisture, 7·05 per cent. of ash.

The following table gives the results of the examination of a number of samples of saffron made during the last two or three years. In the first column is given the amount of moisture, in the second the percentage of ash, and in the third the percentage of ash which would be yielded by each sample if all the moisture had previously been removed:—

| | Moisture per cent. | Ash per cent. | Ash per cent. on dry saffron. |
|---|---|---|---|
| 33 Samples. | 13·8 | 4·6 | 5·33 |
| | 11·0 | 5·5 | 6·18 |
| | 10·2 | 4·5 | 5·01 |
| | 10·4 | 5·7 | 6·36 |
| | 10·6 | 4·9 | 5·48 |
| | 7·9 | 3·7 | 4·01 |
| | 12·9 | 6·8 | 7·80 |
| | 15·8 | 6·4 | 7·60 |
| | 13·8 | 4·8 | 5·56 |
| | 12·9 | 5·5 | 6·31 |
| | 14·4 | 7·2 | 8·41 |
| | 13·5 | 5·6 | 6·47 |
| | 14·1 | 5·2 | 6·05 |
| | 13·0 | 5·4 | 6·20 |
| | 12·7 | 5·5 | 6·22 |
| | 11·4 | 5·4 | 6·09 |
| | 12·2 | 7·0 | 7·95 |
| | 11·6 | 5·6 | 6·33 |
| | 11·9 | 6·6 | 7·49 |
| | 12·2 | 6·3 | 7·17 |
| | 16·3 | 6·4 | 7·64 |
| | 16·4 | 6·2 | 7·41 |
| | 14·3 | 6·4 | 7·46 |
| | 10·9 | 6·1 | 6·84 |
| | 10·2 | 4·7 | 5·23 |
| | 11·2 | 5·0 | 5·64 |
| | 15·0 | 4·4 | 5·17 |
| | 10·2 | 4·9 | 5·45 |
| | 11·3 | 5·4 | 6·08 |
| | 11·3 | 4·9 | 5·52 |
| | 11·6 | 5·8 | 6·56 |
| | 13·7 | 6·1 | 7·06 |
| | 10·6 | 5·2 | 5·88 |
| | 11·2 | 4·8 | 5·40 |
| Mean of all samples. | 12·37 | 5·54 | 6·32 |

It will be seen that the amounts of moisture and ash present a wide range of variation, being from 7·9 to 16·4 in the case of the former, from 3·7 to 7·2 in that of the latter. We find, however, that the mean of the percentages of ash found in all samples approximates closely to the B.P. standard of 6 per cent. But although this tends to show that the official standard is a just one, it is also very obvious from the wide range of variation shown in the above table that, as was no doubt intended by the compilers of the Pharmacopœia, the expression "about 6 per cent. of ash" must be allowed to have its full significance; if this were done, we should not meet with such an absurdity as the pronunciation as adulterated of a sample of saffron containing 7 per cent. of ash. In fact, I find (*Chemist and Druggist*, August 9, 1890, p. 20) that Hilger has met with genuine saffron yielding 8 per cent. of ash.

Turning to the question of moisture in saffron, it seems somewhat surprising that there is no official standard for this. The 'Pharmacographia' gives it as about 12 per cent., and it will be noticed that this figure is in close agreement with the mean shown in the table. It would be manifestly unwise to lay down too strict a limit with regard to moisture, but a standard of "about 12 per cent." might, I think, be safely adopted if public analysts and others could be trusted to give the expression a sufficiently rational interpretation. Such a course would also probably have the useful effect of inducing growers and importers to keep down the moisture within a reasonable limit. At present the retailer who allows his saffron to get at all dried does so to the public benefit, but himself runs the risk which the consequent increased percentage of ash entails. This being the case it would appear to be better if, in the official statement with regard to the drug, the percentage of ash were given on the dried saffron, instead of, as now, on the drug in various states of moisture. This would, of course, necessitate the raising of the present figure to the extent of, say, 1 per cent., *i.e.*, from 6 to 7. These two points relating to the moisture and ash respectively might be embodied in some such way as the following:—"100 parts of saffron dried at 202° F. to a constant weight should lose not more than about 12 parts, and should yield on incineration with free access of air an amount of ash corresponding to about 7 per cent. of the dried substance."

### 2. *Examination of Commercial Samples of Compound Infusion of Gentian.*

Eight samples were examined, and the results obtained are given in the following table:—

| No. of Sample. | Sp. Gr. | Extractive dried at 100° C. Per cent. | Proof spirit. Per cent. | Appearance. |
|---|---|---|---|---|
| B.P. | | 0·855 | | |
| 1 | 1·013 | 7·2 | 21·11 | Very slightly opal. |
| 2 | 0·9835 | 2·3 | 38·87 | Almost bright. |
| 3 | 0·994 | 4·3 | 31·61 | Bright. |
| 4 | 0·987 | 2·7 | 35·47 | Bright. |
| 5 | 0·9945 | 3·8 | 31·03 | Brilliant dark. |
| 6 | 0·999 | 4·24 | 24·36 | Bright dark. |
| 7 | 1·005 | 5·52 | 23·54 | Slightly opal. |
| 8 | 1·010 | 6·47 | 21·11 | Slightly opal. |

A pint of compound infusion of gentian made according to the directions of the Pharmacopœia was next prepared, and gave ·855 per cent. of extractive matter. It will be seen that a concentrated preparation holding in solution eight times the amount of extractive matter found in the fresh infusion should yield 6·84 per cent. of extractive. Only two of the specimens examined approached this figure; the majority contained very much less. The aroma and taste of the samples also varied considerably; the smell of lemon was apparent in some, in others quite absent; one sample had a distinct odour of citronella, reminding one of an inferior hair oil, while the amount of bitterness also differed considerably in the different samples.

While it may be argued that the excellency of concentrated infusion of gentian cannot be measured by the percentage of extractive matter, the possession of a good aroma and taste, or of a useful proportion of alcohol, alone, but should be judged by all these characters, it is nevertheless undeniable that the use of eight times the B.P. quantities of drugs in making this preparation would result in the presence of considerably more extractive matter than was found in the majority of the samples examined. The weaker preparations may be equal to the stronger ones in point of aroma and elegance in appearance, but the pharmacist of to-day will, I think, prefer therapeutic activity to elegance of appearance. With regard to the quantity of alcohol present, it is to be noted that we are dealing with an aqueous preparation, and it is therefore important that the amount of spirit used should be reduced to a minimum, due regard being paid to the presence of a sufficient proportion for keeping the volatile oils in solution, and for preventing decomposition. It cannot be denied that infusion of gentian is best when freshly prepared, but the time and trouble involved by this is inconvenient to many pharmacists. These should ensure that their concentrated preparation when diluted down represents as nearly as possible the B.P. infusion.

My thanks are due to Mr. F. H. Walton, who conducted the examination of the specimens of infusion of gentian.

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A long discussion followed, in which Messrs. Perry, Alcock, Gibson (Wolverhampton), Southall, Campbell (Queen's Hospital), and others took part, at the conclusion of which a hearty vote of thanks was accorded to Mr. Barclay for his interesting and practical paper.

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Mr. F. H. Alcock, F.I.C., F.C.S., read a short note on some infusions which he had asked nine of his students to prepare and bring him for examination. Infus. calumb. and infus. quassiæ were chosen, and the following table shows amount of extractive matter in milligrammes per fluid ounce of fresh infusion:

| No. of sample. | Inf. Calumb. | Inf. Quassia. |
|---|---|---|
| 1. | 111 | 8 |
| 2. | 74 | 4 |
| 3. | 140 | 12 |
| 4. | 66 | 26 |
| 5. | 156 | 6 |
| 6. | 66 | 10 |
| 7. | 80 | 12 |
| 8. | 68 | 8 |
| 9. | 102 | 24 |

This paper gave rise to an animated discussion, as the variation in strength was so great.

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## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

At the meeting of this Society, held on Wednesday, February 14, the chair was taken by the President, Mr. G. T. W. Newsholme, and, after the usual preliminary business, the following paper was read:—

### PHARMACEUTICAL EDUCATION IN THE PROVINCES.

BY C. O. MORRISON.

Of the numerous questions which have occupied the attention of our age, few, if any, have had more thought bestowed upon them than that of education, and certainly no efforts made on behalf of any object have been so well and speedily repaid as those made on behalf of education. Viewing its effects on national life, we find it exercises a greater interest and healthier tone in national affairs, promoting a desire to maintain and improve the mental and commercial position in the competitive strife of nations, whilst in the individual it converts the inattentive into an observant being, the result of which, whilst generally bestowing an advantage upon the individual, exercises an influence for good upon his surroundings. As Ruskin says, "Education, then, is the leading of human souls to what is best, and making what is best out of them; and these two objects are always attainable together, and by the same means the training which makes men happiest in themselves also makes them most serviceable to others."

The arguments which are applied on behalf of the necessity of education for the nation are applicable with equal force to any particular class, and certainly pharmacists are no exception, whilst it is equally certain that the capability of applying general and special knowledge in the case of the pharmacist brings benefit to himself in supplying the wants of others.

Acknowledging, then, as no doubt most of us here do, the general advantage of education, little need be said by me why pharmacists should be alive to the fact that if the members or coming members of our calling are to maintain their position with the public, their general and special knowledge must advance equally with the improvement of the general knowledge of the public.

No time in life is so suitable as youth for commencing study, and it is the education of the youthful portion of our calling in the provinces I intend to consider.

The early inculcation of habits of study are specially beneficial to the chemist's apprentice. The possession of technical knowledge will often make work—which otherwise would be drudgery—into a kind of pleasure, which well repays any toil involved. Instead of saying at the close of day, "another day's work over," the youth should ask the question, "what have I learned to-day?"

Which of the two classes of youths is likely to maintain the credit of their calling, or, to view it individually, to possess the confidence of the public?

We in Sheffield can give a ready answer to this question, for experience has taught that those most ready to take advantage of the technical education given in our school have been among the foremost in maintaining the honour and credit of pharmacy. Another reason why our apprentices should at an early period have the opportunity of becoming acquainted with technical instruction is that they may, ere it be too late, determine their fitness for the trade. Many a youth enters into our calling who makes a splendid salesman, but never a pharmacist; with the result that he is a disappointment alike to himself and to his friends. Unless he finds employment more suitable to his likings and capabilities, Ruskin's saying applies: "True education has respect, first to the ends which are proposable to the man or attainable by him; and secondly, to the material of which the man is made."

If, then, education is so necessary for the moral and national development of our calling, it devolves upon us as a duty to provide that instruction for those whom we have promised to train as "chemists and druggists," but which it is not always convenient to impart in the daily routine of business. The chemists of Sheffield can lay the flattering unction to their souls that the obligation of the education of those under their care has been fully realised and efforts made to meet it. These efforts, whilst not so successful as we could wish, have not been in vain, for numerous instances could be named of men who are lights in their own sphere, because they have been led into the path of systematic study of scientific subjects by the lectures given at the Sheffield School of Pharmacy.

But the influences for good have not ended with the juniors merely; as a society we have been benefited, and as members we have reaped reward for the toil and anxiety involved. We can often better ourselves by doing good to others, and one result of the bringing up of this child of our society has been the creation of a common centre for our varied temperaments, and without sacrilege I think I can safely address you, sir, as the president of a society of friends.

Experience has taught us that in business we are also benefited; the increased application of our juniors to their business quietly but surely improves the position of their masters, so that whilst primarily taking care for others, we also take care for ourselves.

But there is no doubt that what we have done and are doing entails great responsibility, which to us as a society weighs very heavily.

We feel that for the students we should like to do more, especially in the way of advanced classes, but the burden on the Society's funds is already too great, and indeed we have reached crippling point. How to continue our work is the question that faces us, and I think few here would say give it up. Many are the suggestions put forth to meet the difficulties.

It is sometimes said we should raise our fees so that the school should be self-supporting. If we had a compulsory curriculum (and I wish we had) this could readily be done. Unfortunately, as this is not the case, to raise the fees would simply be another way of closing the school, for few students at higher fees would be as bad as a large number at a low fee, if not worse.

And as long as it is a custom of some members of the trade to take as apprentices the sons of persons whose calculation is only how much will it cost to keep their son until he is twenty-one, instead of how much will it cost to keep and educate him until he is qualified, so long shall we have to maintain a low fee if we desire that they should be educated in the sciences appertaining to our business.

A compulsory curriculum, as in the medical profession, would necessitate this calculation, and the sooner the better. Again, it is strongly recommended, more especially by those in high places, and I believe the president of the Pharmaceutical Society of Great Britain has given expression to the remark, that local educational efforts should be affiliated with local colleges or universities. If this could be done successfully, it certainly would be an easy way out of our difficulties, but in Sheffield we must remember this plan has been tried, and it completely failed. In the first place the fees were too high; but supposing these could be lessened by the local society making a grant from its income, which would be less than the rent and other expenses necessitated by the carrying on of the school at present, the burden for the Society would be lighter, certainly, but would the result be as good?

However low the fees might be, unless the students felt that the lectures met their requirements they would not attend them, and at present I have no confidence that they would satisfy the students.

The science lectures lack the necessary application for pharmaceutical students; and although I am aware that true and higher education demands that a student should be acquainted with the generalities of the sciences before he attempts their application, yet, so long as examinations remain the test of qualification, one cannot help but sympathise with the student who desires to obtain that particular knowledge which will assist him to obtain his qualification. In our school here, whilst giving a good grounding in the sciences of chemistry and botany, it is the custom to take examples and illustrations from articles which are met with in pharmacy, which gives the student the advantage of an early application of his studies, to say nothing of the proof to him of the value of his efforts.

If I remember aright, the result of the last deputation that waited upon Professor Hicks, of Firth College, was that the authorities of that college could not see their way to the giving of lectures that would be peculiarly adapted to pharmaceutical students. Until such lectures are given at Firth College I think it would be an unwise procedure, unless our society were compelled by stress of circumstances to say some education would be better than none, to recommend its students to join the science classes at Firth College.

Another suggestion has been made to meet the difficulties of pharmaceutical education in the provinces, and it is one made by Mr. Preston, who, as is his custom on all matters pharmaceutical, has given much thought to this subject, and it is that the parent Society in London should appoint lecturers for given districts, say, for the sake of example, one to the students of Derby, Leeds, and Sheffield. One advantage of this method, and I think only one, is that it would establish classes where at present none are held; but it has many disadvantages. As attendance at lectures is at present voluntary, it is only at night when students can be present, and I very much doubt if principals would permit their apprentices to attend lectures during their business hours. As matters now stand, Sheffield alone would require this district lecturer three nights per week, and this includes the early closing day, when two classes are held consecutively (a feature of our school which I think speaks well for the students, in that they are prepared to give up the only night's holiday in the week, so that they may attend the classes).

As Saturday is a *dies non* for school purposes, this lecturer would have two nights left to dispose of in other towns, being quite inadequate for the purposes intended; whilst any less appointment of time than at present used in Sheffield would leave the good work only partially performed.

Another disadvantage of this suggestion is the expense it would be to the Pharmaceutical Society. I am not aware what salary would be paid to these lecturers, but as they would require to be educated gentlemen, such as only the Pharmaceutical Society can turn out, it would require to be as much as would maintain the dignity of their position—how much that may be I am not aware—but this I do know, the portion of expense that would be incurred by the Sheffield branch, handed to us direct, would allow us to carry on the school on its present basis only under much improved conditions.

It is not lecturers we lack, it is the funds to make it worth their while to lecture, for we cannot expect even local talent to work always for the love of the cause.

Then the problem of pharmaceutical education, as far as Sheffield is concerned, is one of finance. All of us, I am sure, would deplore the necessity of ceasing to perform what, as a society, we have looked upon as a duty, more especially when we see in its performance such beneficial results, and personally, as one who was led as an apprentice to do a little study every day throughout the efforts made in the earlier days of our school, and can see how much more beneficial it would have been if the advantages of systematic training as now given had been within my reach, I should regret if the time came when we had to speak of the Sheffield School of Pharmacy as an institution of the past.

Then, how do I think the problem can be solved? The only way I can see is by an annual grant from the parent Society until such time as a compulsory curriculum is an accomplished fact.

The Pharmaceutical Council, to its credit, has ever been alive to the educational question, but in my opinion it has not kept itself abreast of the times.

Long before examinations became necessary for entrance into business, the Council possessed a school for the imparting of technical instruction, in fact, it was to the Society what our school is to our society, viz., to show and impart the benefits of instruction. But when examinations were established, the necessity for the continuance of the school in Bloomsbury Square was largely done away.

Some of you may say, and not without some reason, that as the preparation for examinations is largely in the hands of "crammers," a school devoid of such perniciousness is advisable. But I would point out that this cause is but a consequence of the establishing of examinations for qualifications, and the Pharmaceutical Council has done nothing to obviate it except by the carrying on of one school and occasional assistance to local schools.

The sphere of influence of the Bloomsbury School is too small to have much effect on the great bulk of pharmacists. The universities and famous public schools, whilst they have done much for education in this country amongst the classes, did little for the masses; and it was not until schools were built amongst the masses that people became alive to the advantages of education. I think that it is the duty of the Pharmaceutical Council to see that pharmacy has within its reach the opportunities of education for its juniors, so that it will be unnecessary for the student to attempt to "cram" into three months, so as to satisfy his examiners, what he should have learnt in the years of his apprenticeship.

The means by which so desirable an end could be attained would be the discontinuing of the Society's school, and the funds, amounting to over £700 per annum, applied by the Council for the carrying on of their school applied to furtherance of education amongst the juniors. This would mean the disbanding of an institution which has done good service to our calling, but I believe the money expended is capable of doing still further and better service. Instead of being applied to the benefit of a few, many of whom, after all, are only preparing for examination, the many throughout the country would have the invaluable assistance of instruction in their early business years, thereby making unnecessary the too prevalent system of cram.

Some may think that £700 a year distributed throughout the country would be but a flea-bite to the actual requirements, but of this I am not so sure. As matters stand now, we do not require keeping, only assisting, and with a grant of about £25 a year we should be in a prosperous condition. It is the increased rent that a school entails that burdens local societies like our own, and if we could only meet the rental without touching the school fees, the entire fees could then be handed over to the lecturers, who would then be somewhat, if not completely, repaid for their services.

I have taken our school as the example of provincial education. We know what good it has done and is doing, but we cannot carry on for long in our present condition of finances, and we are justified, I think, in claiming the greater good for the greater number.

In the discussion which followed,

Mr. Newsholme said that whilst agreeing with a great deal Mr. Morrison said, he could not go with him in the wish to do away with the school at Bloomsbury Square, believing that that school had done, and was still doing, splendid work in the way of pharmaceutical education, and that with regard to the question of the Pharmaceutical Society being asked for a grant of money, he had no doubt but that an occasional grant could be obtained, as it had been in the past, when good grounds could be shown for the necessity for it.

Mr. Ward thanked the author of the paper for having so ably dealt with a subject that had for many years engaged his attention. He strongly advocated a more liberal support being given to provincial education by the Pharmaceutical Council, and agreed in the main with Mr. Morrison, that the school in Bloomsbury Square would have to be supplanted or considerably modified in order to meet the demands of the provinces. He had long felt at what a great disadvantage they were in having to dip their hands into their pockets from time to time in order to maintain their own school and local association, whilst at the same time supporting the one at headquarters. He thought this had something to do with so many holding aloof from joining their ranks.

Messrs. Ellinor, Haining, Ibbitt, and Austen also spoke, and a vote of thanks was afterwards accorded to Mr. Morrison for his paper.

## LIVERPOOL CHEMISTS' ASSOCIATION.

A general meeting was held at the Royal Institution on February 15. The President, Mr. J. J. Smith, occupied the chair.

Mr. T. H. Wardleworth showed a specimen of Tasi root (*Morrenia brachystephana*), grown largely in the Argentine Republic and in the districts round Buenos Ayres. Root of dull yellow colour, and shrinks much on drying. Alkaloid obtained from it of bitter taste and piquant odour, called morrenine. It is used with great success as a galactogogue.

An interesting paper was then read on "The Origin of Species amongst Plants," by Mr. R. C. Cowley.

Mr. Parkinson commended the author for his interesting lecture, and proposed a vote of thanks, which was unanimously accorded.

The next communication was on—

### THE B.P. OLEATES.

BY EDWIN WILLIAMS.

In this the author pointed out that the official oleates are not worthy of the title, being simply solutions of the metal or oxide in oleic acid. They are of indefinite strength, and most of the samples examined contained palmitate or stearate, derived perhaps from the impure oleic acid, although some samples contained sufficient of these impurities to warrant the assertion that they were derived from the soap they had been precipitated from. Oleate of mercury is the one most in demand. He found it a most unsatisfactory preparation. When the proper amount of oxide has been added and the B.P. directions followed, it often takes seven days, and sometimes longer, to form a solution, which is probably not a true oleate. The oleic acid, which is in excess, very soon begins to take up the oxygen, reducing the mercury first to suboxide, this being shown by the change of colour from light brown to slate colour, and ultimately to the metallic form. The preparation takes long to make, and after it is made it is not what it is represented to be, viz., "an oleate." This instability causes trouble to the dispenser, as it prevents him sending out the article always of the same consistency, appearance, and therapeutic strength. A suggested modification of the B.P. process is to place the mortar containing the weighed oleic acid in a pan of boiling water, and maintaining the heat until the oleic acid is about 100° F., then dusting the oxide of mercury into it, and afterwards stirring until a solution is effected, which takes about fifteen minutes. The oleic acid must not be subjected to a great heat, as that favours the absorption of oxygen, causing the oleate to become rancid and smell disagreeably. Oleate of mercury, 10 per cent., made in this manner was found to keep a month and still retain its characteristics and strength. A stronger solution will keep much better, as the excess of oleic acid is the cause of deterioration, owing to its reducing properties. A true oleate should be made by precipitation and diluted as required, a good, easy, and cheap method being to make a saturated solution of Castille soap in water, allowing it to stand for a day to get rid of some of the sodium palmitate which will deposit, decanting the clear solution, and filtering. The filtrate will be composed principally of sodium oleate with some palmitate, and on adding a solution of a neutral salt of the metal, the oleate is precipitated. The solution of the metal must not be acid, or there will be some free oleo-palmitic acid. In the case of mercury it should be kept boiling briskly for two or three minutes to aggregate the particles. This precipitate, consisting of oleo-palmitate of the metal, can now be strained and adherent water got rid of by evaporation in the water-bath. The oleate may be separated from the palmitate by dissolving out with petroleum benzine or ether, which will dissolve the oleate but not the palmitate. The filtered benzine solution evaporated will yield the oleate in a fair state of purity, and this is what the author would call a real oleate, and not a mixture or a solution of the metal in oleic acid. It could be diluted to any strength the prescriber wished with wool-fat, spermaceti ointment, or even oleic acid.

Messrs. Parkinson, Cowley, Wokes, J. Smith, Buck, and the President agreed with Mr. Williams that the B.P. oleate of mercury was an unsatisfactory preparation, and approved of his suggestion that it should be made when required with the aid of a hot-water bath. It was thought by some that a stronger oleate might be kept and diluted with soft paraffin, but this did not meet with general approval, as a preparation different from that of the B.P. would be thus produced.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

At the meeting held on the 8th inst., Mr. F. Walker, President, in the chair, Mr. Geo. Brinson showed a wholesale price list, dated August, 1873, and drew interesting comparisons between prices then and now.

Mr. J. Jones caused considerable amusement by reading a letter from a native African who had written to a Liverpool firm for quotations.

Miss E. M. Wood was then called upon for her lecture on "Parasitic Plants." The lecturer confined her remarks chiefly to British plants of a parasitic nature, detailing their habitat, mode of growth, etc. The mistletoe was chiefly found on apple trees, and not on the oak, as popularly supposed. It was propagated by birds, whose bills on piercing the fruit were covered with natural bird-lime with the seeds adhering thereto. The birds, endeavouring to rid themselves of this substance, rub their bills on the bark of other trees. The Dodders (*Cuscuta*) have neither leaves nor cotyledons to the seeds, but otherwise conform to the characteristics of the Convolvulaceæ. Once settled in a locality they are difficult to eradicate. The idea that they kill their hosts by strangulation has now been abandoned. Rootlets, penetrating the stem of the host, absorb nourishment, and thus kill the plant. Each species of Dodder affects its own particular plant, as clover, heather, flax, nettle, etc. They are exceedingly scarce round Liverpool. Plants of the natural order Orobanchaceæ are all leafless root-parasites, and, like the *Cuscutæ*, have their individual preferences for certain plants. *Lathræa squamaria* grows on the roots of the hazel. *Monotropa Hyppitys* (Ericaceæ) is sometimes classed as a parasite, but more recently as a saprophyte. Scrophulariaceæ contains several parasites in a greater or less degree, as *Rhinanthus Crista-galli*, *Bartsia Odontites*, *Euphrasia officinalis*, *Melampyrum pratense*, etc. Some authors ignore the idea of these being parasites, but Bentham, Hooker, and Prantl call them more or less parasitic. The ivy is not a true parasite, its adventitious roots being used as support only. In conclusion, Miss Wood remarked that the minute structure of parasites required thorough research. The lecture was illustrated by paintings and dried specimens. A vote of thanks, proposed by Mr. W. Pipe, and seconded by Mr. T. S. Wokes, was awarded. Messrs. Wardleworth, Last, Mitchell, Brinson, and the President joined in the discussion.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

On Thursday, the 8th inst., a lecture was delivered before this Association by Mr. E. H. Douty, M.A., M.B., Senior Demonstrator in Anatomy in the University, on "The Brain."

The lecture was well illustrated with numerous typical specimens and diagrams.

# Scottish Transactions.

## EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The fifth meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36 York Place, Edinburgh, on Wednesday, January 31, at 9 o'clock, Mr. Alex. J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, the following papers were read:—

### POWDERS.

BY J. S. GUTHRIE.

The author gave a description of the various forms in which powdered drugs are administered—namely, pills, tabloids, cachets, capsules, and granular preparations. He suggested the keeping of a sugar of milk tabloid, to which solutions of active drugs, such as aconite, could be added when required. Capsules were better adapted for liquids than powders, and he regarded cachets as the best form for powders. Granular preparations were open to the objection that they were readily affected by moisture.

The next paper was a

### NOTE ON ALOES AND IRON PILLS.

BY W. F. MARTIN.

The author said the quantity of confection of roses ordered in the Pharmacopœia to make this pill mass was too small, and the pills could only be rolled out with difficulty. The pills also soon became very hard and unsatisfactory. He had made some experiments to obviate these objections. An excipient consisting of one part glycerin of tragacanth and three parts confection of roses made an excellent pill in the official proportions. The best pill mass, however, was got by using equal parts of glycerin of tragacanth and confection. The proportions he found most suitable were:—

Take of—

| | |
|---|---|
| Sulphate of iron | 1½ part |
| Barbadoes aloes | 2 parts |
| Compound cinnamon powder | 3 parts |
| Glycerin of tragacanth | 1½ part |
| Confection of roses | 1½ part |

9½ parts of the above are equal to 10½ of the official pill mass. It therefore takes 109 grains instead of 120 to make twenty-four pills. The pills have thus the advantage of being smaller, and they keep better than with any other proportion tried.

The next paper was a note on

### CITRINE OINTMENT AND LINIMENT OF LIME.

BY W. F. MARTIN.

The author had recently dispensed an ointment consisting of equal parts of citrine ointment and liniment of lime. In twenty-four hours the ointment was distinctly darkened in colour. With some ointments the change took place very rapidly. The object was to find out the cause of this blackening. It was thought it might be due to the presence of mercurous salt in the ointment and precipitation of mercurous oxide by the calcium hydrate. The solution of mercury in nitric acid for the ointment was made in strict accordance with the official directions, and on being tested there was no evidence of mercurous salt. With this the ointment was made very carefully as officially directed. The product, when tested, indicated a small proportion of mercurous salt, showing that reduction had taken place. It was found that olive oil did not reduce the mercuric salt, but lard, both in the fresh and rancid state, did so distinctly. The finest lard was employed. Although there is excess of olive oil in the liniment of lime, complete saponification does not seem to take place, and there is still a small quantity of free calcium hydrate present. The blackening of the ointment is therefore due to the precipitation of black mercurous oxide by the free calcium hydrate.

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The next paper was on

### CALOMEL AND POTASSIUM BROMIDE.

BY L. N. THOMPSON.

The paper dealt with the following prescription, which had been written for a child:—

| | |
|---|---|
| ℞ Potass. bromidi | Grs. x. |
| Calomel | Grs. iii. |
| M. Ft. pulv. mitte tales xii. | |

As soon as the ingredients are rubbed together in a mortar, the mixture begins to darken, and if water is added the powder instantly becomes greyish black. It was found that if the potassium bromide was powdered and then dried so as to remove interstitial moisture before being mixed with the calomel, there was no darkening, but the same change took place instantly on the addition of moisture. It was thought that the presence of carbonate or free alkali in the bromide might cause formation of black mercurous oxide, but on testing with phenolphthalein and litmus it was found that the salt was quite neutral. After adding water to a quantity of the mixed powders it was sublimed, and the sublimate contained distinct globules of metallic mercury. The mixed powders were shaken up with water and filtered. On acidifying the filtrate and warming with copper foil metallic mercury was deposited, indicating a soluble salt of mercury. On shaking up with ether and evaporating the ether, mercury was found in the residue, indicating a mercuric salt. On adding solution of strychnine hydrochlorate to the aqueous solution a dense white precipitate separated, indicating the double salt, $HgBr_2 2KBr$, analogous to Meyer's reagent, $HgI_2 2KI$. The darkening is therefore due to the separation of metallic mercury from the calomel, and is explained by the following equation:—

$$2HgCl + 4KBr = (HgBr_2 2KBr) + Hg + 2KCl.$$

The prescription therefore is an example of a dangerous incompatibility, as the mercuric salt formed is a powerful poison. There is no method by which the decomposition can be avoided, and calomel and potassium bromide should never be prescribed together.

The next paper was on

### CALOMEL AND TINCTURE OF IODINE.

BY L. N. THOMPSON.

The following prescription was the subject of inquiry:—

| | |
|---|---|
| ℞. Tinct. iodi | ℥i. |
| Calomel | Grs. xx. |
| M. | |

This curious prescription had been ordered and directed to be painted on a glandular swelling on the neck. What the prescriber desired seemed difficult to understand. On adding the calomel to the tincture of iodine, the latter was nearly decolorised, and the calomel became of a bright red colour. The decomposition was investigated and explained as follows. The calomel and potassium iodide react thus:—

$$2HgCl + 4KI = HgI_2 2KI + Hg + KCl.$$

The free mercury was seen to separate and change to green iodide, and ultimately red iodide. One fluid ounce of tincture contains eleven grains potassium iodide, and this reaction therefore uses up 7·8 grains of the calomel, leaving 12·2 grains to react with the free iodine, thus:—

$$2HgCl + I_2 = HgCl_2 + HgI_2.$$

One fluid ounce of tincture contains eleven grains of iodine. 12·2 grains calomel contain 10·4 grains of mercury. One half is 5·2, and requires 6·6 grains iodine to form $HgI_2$, leaving 4·4 grains of iodine still free.

In the first reaction, 3·3 grains of mercury are set free. This requires 4·2 grains of iodine produce to form $HgI_2$, leaving 0·2 grains iodine still free. When the reaction was completed the free iodine was determined volumetrically, with the result that one fluid ounce contained 0·24 grain, thus confirming the above explanation. The bottle then contained a solution of mercuric chloride and mercuric iodide, with a little free iodine and a precipitate of mercuric iodide. It had been found that on standing a further decoloration ensued, and probably the following equation explained how this came about:—

$$HgCl_2 + I_2 = HgICl + ICl.$$

On adding iodine to solution of mercuric chloride a yellow precipitate formed, and gradually changed into a crystalline red precipitate. There was no evidence of free chlorine, and the above equation showing the formation of iodochloride of mercury, known to occur in yellow rhombic crystals, which change to tetragonal red crystals, and monochloride of iodine, may explain the further decoloration, but this was not proved. He had been assisted and guided by Mr. Hill in carrying out the experimental work for this paper and the previous one.

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The reading of the papers was followed by an interesting discussion, taken part in by Messrs. Cowie, Dey, Guthrie, Hill, Lyon, McBain, Mackenzie, Martin, Simpson, Swanson, Thompson, and White, and on the motion of the Chairman a vote of thanks was awarded to the authors.

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## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, February 15, Mr. W. L. Currie presiding, the following paper was read:—

### DISPENSING NOTES AND QUERIES.

BY ALEXANDER BOYD.

Any suggestion that may increase our knowledge of dispensing must be welcome. Just as the composing of the prescription must be the result of the whole education and experience of the physician, so must the dispensing of the prescription be the result of the whole education and experience of the pharmacist. Let us all hope that a time is coming when the public will value more than it does the skill and qualification of the dispenser, and when it will attach more importance to them than it does at present when considering the cost of having a prescription dispensed. With a view of exciting a discussion on a few points of interest in connection with this subject, I have brought forward the following notes and queries, which I hope may help as an introduction.

The first is a point in pharmaceutical law. What procedure should be adopted when dispensing a prescription containing a poison within part 1 or part 2 of the schedule of poisons? The Statute says that none of the regulations anent labelling and registration shall be enforced when any of these forms are ingredients in a physician's prescription, except that the name and address of the seller shall be upon the label attached to the bottle or vessel containing the mixture, or whatever it may be. But it goes on to say that such prescription shall be copied into a book, kept for that purpose, called the prescription book, with the name of the party for whom the medicine is intended. This makes it compulsory to copy (which is registering) a prescription which contains a scheduled poison. Now suppose such a prescription to be repeated again, will it be necessary to copy it again, or retain a note that it has been re-dispensed? Is the clause wide enough to cover repetitions? or are they outside its limits? If it is necessary to register repetitions, will the necessity apply only to those containing poisons included in part 1 of the schedule? or will it apply to those containing poisons in part 2 as well? I should like to hear the opinion of this meeting on this point.

The next subject I wish to bring before your notice is solution of dialysed iron. The B.P. says that this solution should give no precipitate with either solution of ferrocyanide of potassium or solution of nitrate of silver. I have examined many specimens of this solution, but I have never come across any one yet that does not give a precipitate with either of these reagents. Dialysed iron is sometimes prescribed with liquor arsenicalis, and when these two are mixed a precipitate occurs. I have tried the acid solution of arsenic with solution of dialysed iron, and find that no precipitate occurs. The precipitate must be caused by the potassium carbonate in the liquor arsenicalis. Should we use the acid solution of arsenic when liquor arsenicalis is prescribed along with solution of dialysed iron?

The next point I wish to bring before your notice is creasote pills. A great many excipients have been recommended for making these pills. Light magnesia is now discarded, I think, for this purpose by every intelligent pharmacist. Creasote pills made with magnesia do not contain creasote in a pure unaltered form. Chemical combination takes place between the magnesia and the creasote, and the result is an insoluble mass not consistent with the intentions of the prescriber. Mr. Martindale's formula is the one which meets the case best. He recommends pure animal soap in fine powder, 120 grains, and creasote, 2 drachms, to be put into a one ounce wide mouth stoppered bottle and digested in a water-bath till they combine. A simpler way than this is to put the soap and creasote into a mortar which has been first well warmed with boiling water, and rubbing together till they combine. Creasote is a valuable therapeutic agent, but it is very apt to cause sickness and nausea when given for a time. The pill is the best form for its administration, and if to be given for a length of time should be keratin coated. This prevents the nausea and sickness to a great extent. Should we do this without the order of the physician? We may at least suggest it to him.

I now wish to ask a query as to the most suitable basis for some kinds of urethral bougies. Cocoa-butter is an excellent basis for most kinds. But for some combinations, especially in warm weather, this is too soft. Wax is not a desirable addition. If white wax is added, or stearin, the very purest should be used, as these are often adulterated with hard paraffin, which has a very high melting point. Whatever basis is used its melting point should be adjusted to blood heat, that is, just under 100° F.

I will conclude these short notes by alluding to two mixtures which I lately dispensed. One contained magnesia and chloride of ammonium. In this case the magnesia decomposed the chloride of ammonium, giving rise to free ammonia in the mixture.

The other contained tincture of perchloride of iron, citrate of potassium, and sulphate of magnesium. This produced a beautiful green solution, in which a white precipitate was slowly formed. On collecting this precipitate after washing I found it charred when heated with sulphuric acid.

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In the discussion which followed,

Mr. J. A. Russell, referring to the solubility of potassium chlorate (1 in 16 of water, according to Squire), said he had tried both powder and crystals, but could not get such a solution at ordinary temperatures. The crystals were the more soluble, but he thought the varying temperature of apartments would make the chlorate crystallise out of a saturated solution. He found a difference in making Blaud's pills with ferri sulph. newly powdered and that which had been kept powdered for some time. Water of crystallisation would be lost from the powdered salt, and in some salts it would make considerable difference in the strength of the dose.

Mr. Thomas Dunlop found that the brown coloration produced by sodium salicylate and sp. ammon. aromat. in mixtures was due to ammon. carbonate, and developed more quickly with the natural salicylate than with the physiologically pure. One grain of sodium hyposulphite in a six ounce mixture kept it quite clear. Mr. R. Brodie referred to a gargle frequently prescribed, containing potassium chlorate and strong hydrochloric acid. As explained by Mr. A. McKeller, the acid was dropped on the chlorate in a powdered state, and allowed to stand in the bottle until fumes of chlorine gas filled it before adding water. A solution of chlorine was intended to be made, the chlorate being changed into chloride, which dissolved readily in the water. Mr. McKeller also referred to hydrogen peroxide with sodium carbonate as being prescribed in cases of diphtheria. The mixture effervesced violently, and it was hazardous to cork it up. Several other items in "domestic medicines" were made to furnish amusement as well as instruction.

Opinions of members were afterwards taken on any of the points raised by previous speakers. Regarding the point at law referred to by Mr. Boyd, it was thought that a note of repetitions made in a prescription book covered all the conditions; but something must be allowed to the discretion of the chemist. The President said it was his custom to re-copy such prescriptions, so that the physician could be told at once when and how often repetitions had been got. Regarding the solubility of salts, it was inferred that "Squire" would use distilled water and a standard temperature, while in prescriptions crystals were properly to be used. Several members had experienced trouble with sodium salicylate, and variously put it down to impurities in the salt, or the formation of ammonium salicylate; but Mr. Dunlop stated that ammonium salicylate gave a clearer solution than sodium, the degree of colour varying from clear to pale straw colour, according to the higher combining weight of the ammonium, sodium, or potassium base.

The President regarded the night's proceedings as very profitable and worth following up, and advised the members to keep a note-book on their desks for the purpose of jotting down anything of interest that might occur in business. He had found "The Art of Dispensing" a useful book.

Mr. Russell stated that the "Excise" were on the alert, and it had come to his knowledge that proceedings were being instituted against a proprietor for selling a penny box of Hamilton's pills. Notice had been received asking the said proprietor why he should not be prosecuted. Members were very pronounced in denouncing this action on the part of the Excise, and considered their action could not be sustained in a court of law.

This completed the business, and the meeting closed.

### EDINBURGH CHEMISTS' BALL.

The Edinburgh Chemists' Ball was held on Thursday, February 8, in the Freemasons' Hall, George Street. There were about eighty couples present, and everything passed off most successfully. At supper, Mr. J. Laidlaw Ewing, chairman of the North British Branch Executive, proposed the toast, "Success to the Edinburgh Chemists' Ball," and paid a high compliment to Mr. J. T. Coats, the Convener, to whose energy and ability they were indebted for the successful evening's enjoyment. Messrs. Coats and Melvin proved very efficient masters of ceremonies. The music was supplied by Dunn and Davidson's Band.

### DUMFRIES AND MAXWELLTOWN CHEMISTS' ASSISTANTS' DINNER.

On Thursday evening, February 8, the Dumfries and Maxwelltown chemists' assistants held their first annual dinner at the Royal Restaurant. The chair was occupied by Mr. W. G. Johnstone, of Messrs. Ewing and Co., and Mr. J. Lockerbie acted as croupier. After an excellent dinner had been disposed of an appropriate toast-list was gone through, and during the evening an enjoyable musical programme tended much to increase the pleasure of the company.

## Parliamentary and Law Proceedings.

### HERBALISTS AND THE APOTHECARIES' ACT.

A case of considerable public importance was heard on February 14 at the Keighley County Court, before his Honour Judge Gates, Q.C., and a jury, wherein the Medical Defence Union, acting on behalf of the Society of Apothecaries, brought two actions to recover penalties of £20 each from Mr. Henry Newton, herbalist, 20 South Street, Keighley, a well-known member of the Keighley Town Council. Dr. Showell Rogers, Birmingham, represented the society, and Mr. Walter Beverley, barrister, was for the defence. The main facts were admitted. They were that in June and July last the defendant attended at Utley the infant daughter of a tram-car driver named Holmes. He was called in on June 28, and found the child, aged two years, lying on the sofa. He examined her as an ordinary medical man would do, feeling her pulse, looking at her chest and tongue, and asking whether or not she had had the measles. He ordered her to be put into a cold pack, and directed that some medicine should be called for. On a second visit he pronounced the case to be scarlet fever, but did not order the child to be put to bed. Next day he took some gargle mixture and painted the child's throat. On the Monday following he pronounced the child much better, and said that she might be dressed; and it was alleged that he added—though on this point there was later in the case a complete denial given by the defendant—that she might be taken out of doors, "though no one was to be told about it." This advice was not acted upon, and as the child began to grow worse a message was sent to the defendant, who, his assistant said, was suffering from a slight attack of scarlet fever, and could not come. The assistant was sent in his place, and after seeing the child he said there was nothing serious the matter with her. The parents, growing anxious, called in Dr. Moffat, and word was sent to the defendant that he need not come any more. He subsequently sent in a bill for £1 5s. 5d., which, besides medicines, included charges for eight visits at 2s. each. When the child's father called to pay he found he had not sufficient money, and a receipt was given on his paying £1 3s. 6d. Dr. Rogers pointed out that the action was brought under the Apothecaries' Act of 1815, the object of which was to prevent unqualified persons from practising as apothecaries, inasmuch as "much mischief and inconvenience had arisen from great numbers of persons," wholly ignorant and utterly incompetent, "practising in that capacity, to the injury both of the public and of professional men, who had secured their degrees by the expenditure of a great deal of money in preparatory education and training." The definition of an apothecary had been very well laid down by Mr. Justice Cresswell in the Assize action, the Apothecaries' Company *v.* Lotinga, tried in 1843, in the words:—"I apprehend that an apothecary is a person who professes to judge of internal diseases by its symptoms, and applies himself to cure that disease by medicines." Another case brought by the Society against a defendant named Nottingham in 1876, before Baron Bramwell, was also cited in support of this action. It was clear that a man calling himself an herbalist was not at liberty to act as a medical practitioner any more than a person, by merely assuming the name, would be allowed to officiate as either a clergyman, a barrister, or an architect. There was also a more recent decision confirming the argument, in the action brought in 1890 by the Apothecaries' Society against an herbalist named Welch.

Evidence having been given in support of the society's case, Mr. Beverley, for the defence, said his client had for nearly thirty years conducted his business as an herbalist in Keighley, and had that business plainly indicated on his shop, and he was a registered chemist and druggist. The authority under which the defendant practised was an Act passed in 1542 for the benefit of the poorer classes of the community, and to protect them from the extravagant charges of surgeons and others, who up to that time had had a sort of monopoly. By this Act it was permitted to persons having knowledge of herbs, roots, and waters, to use and minister herbs, &c., for outward ailments, and to give drinks for stone, strangury, or ague. That old Act of Parliament was still operative, and the Act of 1815 was never intended to include herbalists at all. Although an herbalist, in the practice of his business, had done acts amounting to practising as an apothecary, still if the acts were within the province of an herbalist, and confined to herbal preparations, he was not liable. Mr. Beverley went on to point out that the apothecary had larger powers as to both range of drugs and ailments, but he contended that at the time of the Act of 1815 his province was simply that of a compounder of medicines, and that the enlargement of his functions had grown up in subsequent years, so that although the dictum of Justice Cresswell might be right in 1843, it did not apply to a state of things obtaining when the Act of 1815 was passed; and therefore it was not fair to the defendant to fine him for doing what he would have then been within his province in doing. And even if, in continuing his attendance upon the case after scarlet fever had manifested itself, action against him could not properly be brought under the Apothecaries' Act.

Henry Newton, the defendant, said he had been in business at Keighley twenty-six years. He had attended the case, but he gave a complete denial to the suggestion that he had suggested that the child might be taken out after the scarlet fever had manifested itself. He had notified the existence of the disease to the local authority.—Questioned by Dr. Rogers, he said that the form he had filled up was in a kind of book supplied by the local authority to other than medical men. Defendant sometimes signed as "eclectic practitioner." He was registered as a chemist and druggist, but had passed no examination. He was in practice as a chemist and druggist before 1868, and therefore claimed to practise. He had no certificate as an apothecary, but he considered that as an herbalist he could visit under the Act of Henry VIII.

Replying on the whole case, Dr. Rogers pointed out that the Act quoted had nothing to do with internal complaints. As to what an apothecary was, in 1885 Lord Justice Cotton, in the case Davis *v.* Makuna, laid it down that though the Apothecaries' Act did not define the nature of an apothecary's employment, the dispensing and mixing of medicines, giving medical advice, and attending the sick as medical adviser must be construed as acting in that capacity. No Act of Parliament from the time of Solon had ever allowed an herbalist to visit people at their houses as an ordinary medical practitioner. An herbalist must sell herbs, or medicines made from them, and that was all he could do. The defendant was not a proper doctor, and therefore not a safe man to entrust with the lives of little children or older persons. He was an improper, illegal practitioner, taking the feathers of a peacock, and trying to practice as a legally qualified person.

His Honour, in summing up, said he thought the jury would be perfectly safe in following a most eminent judge like Mr. Justice Cresswell. Experience confirmed the opinion that an apothecary was a person professing to judge of internal disease by symptoms, and applying himself to cure it by medicines. The issue might be very important to the defendant, but it was also very important to the interests of society, and especially to a great number of poor people, who could not protect themselves. If there should be sloppy and loose administration of the law, it would be hard upon these persons. If the jury believed the evidence they ought to find for the plaintiffs.

After a short retirement, the jury found accordingly, and his Honour gave judgment for £20 and costs.

Dr. Rogers pressed for a penalty in a second case against the defendant.

Mr. Beverley hoped that the society would withdraw, but as this suggestion was not accepted he accepted judgment without having the jury sworn.

His Honour said he had been looking over defendant's certificate book, and found that his practice had been most general, there being cases of typhoid and scarlet fever. There would be judgment for £20, but costs would not be given in the second case.—*Yorkshire Post.*

### ILLEGAL SALE OF ARSENICAL SHEEP DIP.

On Wednesday, February 14, before the Chester city bench, Mr. William Pearson,* of the firm of Pearson, Barton, and Co., druggists, &c., Brook Street, Chester, appeared in answer to three summonses charging him with—(1) Selling on February 1 arsenic without entering the same in a poisons' book as provided by law; (2) selling on the same date arsenic to a person not of full age; and (3) selling arsenic to a person unknown and without a witness.

The proceedings were instituted by the police, and Mr. Brassey appeared for the defence.

The chief constable (Mr. G. L. Fenwick) stated that in consequence of complaints he instructed Detective-Inspector Gallagher to send a boy to the shop of defendant on February 1. Defendant was asked to supply two articles—one a packet of "Cooper's Sheep Dip." It was supplied, and the boy was not asked a single question, nor was he asked to sign his name, and no entry was made in any book. The packet was handed to the public analyst, and he would tell the bench that he found it contained 23 per cent. of arsenic, or in other words the packet weighed without the paper 1¼lb., and of this there were five and a half ounces of arsenic in some form or other, and the rest was sulphur and moisture. It contained, the analyst would tell them, sufficient arsenic to poison about 900 adults, and what made the case more serious was that it was put up in yellow paper, and it was only labelled poison in small letters near the directions. The defendant had not marked it poison, although it had his label upon it. The colour of the paper and the contents of the packet were dangerously like ordinary mustard, and if it was in a cupboard within reach of a careless domestic, one could imagine the fatal consequences which might accrue. There were five and a half ounces of arsenic in the packet, and an arsenical mixture like pure water could be formed by putting some of it in water. Defendant was not entitled to sell poisons at all, even if he did enter it into a book, because he was not on the pharmaceutical register, and therefore was not a qualified chemist. He thought he had paid the penalty of the Pharmaceutical Society for acting as a registered chemist. The defendant was liable to a penalty not exceeding £20 in each case.

Edwin Thomas Paulson, 17 years of age, deposed to purchasing a packet of sheep dip and a pound of horse powder from defendant on February 1. He was supplied with it without being questioned. When he got outside the shop he handed the articles to Detective-Inspector Gallagher.

Detective-Inspector Gallagher stated that he sent the last witness to the shop of defendant. He purchased two packets, one of which was the one produced. Witness handed the packet containing the dip to Mr. Lowe, the analyst. On February 9 he went with the chief constable to see defendant, and he heard defendant say he did not know he was doing wrong to sell "Cooper's Sheep Dip," as it was sold everywhere. He also added that he was very sorry, and admitted having no poison book, and making no entry.

Cross-examined by Mr. Brassey: He had not tried to buy the dip anywhere else.

Mr. W. Foulkes Lowe, city analyst, said he received a packet of sheep dip on February 1 from the last witness for analysis. The packet weighed 1½ lb., and the contents without the paper weighed 1¼ lb., and were found to be constituted as follows:—Arsenious oxide (white arsenic), four ounces; arsenious sulphide, one and a half ounces; sulphur, one pound; and moisture, one and a half ounces. The packet contained sufficient white arsenic to kill about 900 men, and it was a bright yellow powder, similar in appearance to mustard. It was made up in a yellow packet, similar to a mustard packet. It was certainly a very dangerous substance, especially as the only indication that it was poisonous was the small letters at the end of the directions for use.

Mr. Brassey, for the defence, said there was no doubt his client was technically guilty under an old Act of Parliament, which dealt with the particular poison of arsenic quite differently from the ordinary class of poisons. He should like to draw the attention of the bench to this fact, that under the special statute relating to arsenic these charges for which his client was summoned could be brought against any person, whether a registered chemist or not, provided that he did not do what ought to be done, viz., take the address of the person, and not sell to a person unknown, or a person under age. While he knew that somebody must be summoned first, and while he made no complaint that he was the first, his client was entitled to show to the bench that this preparation had been extensively sold by druggists and non-druggists for the last fifteen or sixteen years in the trade, and he supposed it would continue to be sold so long as vermin existed on sheep. The Act of Parliament allowed the wholesale sale and manufacture of it without the slightest penalty. To show how this thing was sold, his client was with Messrs. Bowers for many years, and during the whole of that period Messrs. Bowers, who, as the bench knew, were very estimable people of business, sold this stuff without the slightest suspicion.

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* This name does not appear on the Register of Chemists and Druggists for 1894.

The Chief Constable: But they are registered chemists.

Mr. Brassey: No matter; under this special Act, whether a person is a registered chemist or not, he has no right to sell it, and Messrs. Bowers have been dealing with it for the last ten years without knowing that they were doing wrong. His client, after receiving the summons, sent a boy who was under age to other chemists, and he purchased a packet of the same thing from the following shops: Baxter's, Donald's, Kemp's, Hincks', and Huke's, in the same *bonâ fide* way he himself sold it. The bench would see that it was a matter which required public attention.

The Chief Constable: They are all registered chemists; defendant has no qualification at all.

Mr. Brassey: Chemist or no chemist, it does not matter.

Dr. Stolterfoth (from the bench): Did the registered chemists enter it into a book?

Mr. Brassey: No. *Bonâ fide* people in this town are dealing with this thing in ignorance; the law does not require any severe penalty, more than calling attention to the wrong, and preventing its repetition.

The Chief Constable said the Pharmaceutical Society had been prosecuting elsewhere, and reports appeared in their own journal, so that it was hardly fair to say chemists knew nothing about it.

Mr. Brassey: There are men dealing with an article manufactured for trade purposes, who did not analyse it and did not know what it contained.

Dr. Stolterfoth: But defendant is a retail dealer.

Mr. Brassey: There are hundreds of poisons sold without any objection. Carbolic acid, a most deadly poison, you can buy anywhere. I could give you the names of lots of most deadly poisons you can buy.

Mr. Fenwick: They are not scheduled poisons.

Dr. Stolterfoth said a small quantity of this poison would prove fatal.

Mr. Brassey: My client never dreamt of the thing being wrong.

The Bench considered the case proved, and the Chairman (Alderman C. Brown) said the Bench had decided to deal leniently, believing the offence had been committed in ignorance. Defendant would be fined 40s. and costs for the first offence, and he would have to pay the costs on the other two summonses. They hoped the case would be a warning. It was a most dangerous thing, and it was quite right of Mr. Fenwick to bring the matter forward.—*Chester Chronicle.*

### THE SALE OF INSECT POWDER.

In the High Court of Justice, Chancery Division, on Wednesday, February 14, before Mr. Justice North, judgment was given in the case of Keating *v.* Wright. The plaintiffs in this action were the proprietors of Keating's insect powder. The defendant was a chemist, of Shields Road, Byker, Newcastle-on-Tyne. The action was for the purpose of restraining the defendant from selling or offering for sale, as Keating's insect powder, powder that was not of the manufacture of the plaintiffs. The plaintiffs' case was that Mr. Wright had on certain occasions, when asked for Keating's insect powder, sold his own in 3*d.* boxes, with words to the effect that it was all Keating's powder, though he made it up himself. The boxes bore his own name and had no reference to Keating. The defendant, on the other hand, affirmed that he had never gone beyond saying that his own insect powder was better than Keating's. The case depended on oral evidence. The trial was concluded at the rising of the court, and his lordship then said he would give judgment on Wednesday.

Mr. Swinfen Eady, Q.C., and Mr. Fellows appeared for the plaintiffs; Mr. Everitt, Q.C., and Mr. Vernon Smith for the defendant.

Mr. Justice North, in giving judgment, in the first place dealt with observations that had been made on the fact that in this case the defendant had not sold any powder, not really Keating's powder, with any label or written representation that it was Keating's. He said that there was no difference in principle between verbal representations and representations in writing for the purpose of passing off goods of one person as those of another, just as there was no difference between trade libel and trade slander, though in the case of verbal misrepresentation there was more difficulty of proof. When verbal misrepresentations were alleged it became necessary to examine the evidence the more critically. He was glad that in this case he had the opportunity of seeing the demeanour and conduct of the witnesses in the box, and carefully considering the evidence both at the time and in reading his notes afterwards. He mentioned particularly the evidence of two boys who had been subjected—very properly—to stringent cross-examination. He came to the conclusion that the evidence of the plaintiffs' witnesses was substantially correct. If this were not so the persons giving it must have entered into a conspiracy. The boys must have been carefully instructed what they were to say. Looking at their behaviour in the box, he could come to no such conclusion. He came to the conclusion that Mr. Wright had, in fact, said, with reference to the powder he sold, on certain occasions, "It is all Keating's powder, though I put it up myself"; and that, in law, he had said more than he was entitled to do. No doubt a man, when asked for such an article as Keating's powder, was entitled to do what he could by fair means to persuade his customers when asking for Keating's powder to buy his own powder and to say that his own was better; but in this case the defendant had, as his lordship found, gone beyond that. He therefore granted an injunction to restrain the defendant from selling or offering for sale, as Keating's insect powder, powder not made by the plaintiffs, and ordered the defendant to pay the costs of the action.—*Times.*

### INLAND REVENUE PROSECUTION.

On Wednesday, February 14, at the Heywood Borough Court, before the Mayor (Alderman Lawton) and Messrs. T. Popple and S. Firth, John Birch, chemist, York Street, was summoned, at the instance of the Commissioners of Inland Revenue, for exposing for sale a bottle containing a preparation used and applied as a medicine which was liable to stamp duty, without having it wrapped in a paper or label, duly stamped, denoting the duty charged on such bottle. Mr. Squire, from the Solicitors' Department, Somerset House, appeared to prosecute.

Mr. Squire said on November 3 an officer of the Inland Revenue purchased at the shop of Mr. Birch a bottle containing the "X.L. Extract of Malt and Cod Liver Oil." He claimed that the bottle should have upon it a threepenny label, but Mr. Birch said he did not think it required one. The law required that all chemical or officinal preparations whatsoever for the "prevention, cure, or relief" of any disorder or complaint affecting the human body, or which had been advertised or recommended to the public by the makers, vendors, or proprietors as nostrums or proprietary medicines, or of specifics beneficial for the prevention or cure or relief of any distemper, malady, ailment, disorder or complaint, should be liable to duty. On the bottle containing the preparation sold by defendant it was stated that it was "Birch's" mixture.

Evidence having been given of the purchase of the bottle, defendant argued that the mixture of cod liver oil and malt extract was a food, recognised as such by the medical profession, and not as a medicine. The wording was identical with the wording on the labels of bottles containing "Kepler's Solution of Cod Liver Oil and Extract of Malt," which was sold all over without duty. He got the bottle produced from the wholesale warehouse a week ago.

Mr. Squire asked to see the bottle, and after comparing the label with the draft of the label submitted to the authorities, which he had with him, said he was prepared to submit to the authorities that the label on the Kepler bottle, which differed materially from the draft he had, was liable to duty.

Defendant: That extract is sold by the ton.

Mr. Squire pointed out that the duty in this case was not put on the contents of the bottle, but on the wording of the label. They could sell golden syrup in bottles without duty, but if they labelled it "Smith's valuable preparation for lung diseases," that made it liable to duty.

Defendant argued that his mixture was a food, and therefore not affected by the laws regulating the sale of medicine. He had seen brandy advertised as a cure for influenza, but no one would think of charging stamp duty on the sale of brandy.

After Mr. Birch had called evidence to prove that the mixture was composed of foods only, the Bench retired.

On returning, the Mayor said that the Bench considered the case proved, and should fine defendant 6s. and costs.

Mr. Squire: Mr. Birch will understand that his label must be altered.

The Mayor: We take it that Mr. Birch will submit a new label to you.—*Manchester Courier.*

### POISONING BY SPIRIT OF SALT.

At Marylebone, on Saturday last, before Coroner Thomas, an inquiry was held into the death of Robert Thomas Robson, aged 45, a blacksmith, of 81, Bolsover Street, Euston Road. On the previous Saturday night his wife found him lying at the Middlesex Hospital. He told her that he had taken spirit of salts in mistake for gin. He used the former for odd mending jobs. He said, "I had two bottles in my pocket, one of which contained a drop of gin, and the other—which was very similar—contained spirit of salts. I got hold of the wrong bottle and swallowed some of the poison. When I became aware of this mistake I went to the Middlesex Hospital, but before I reached there I sank down in Mortimer Street." He died in his wife's arms at the hospital on Friday.

Dr. Wakling added that death was due to perforation of the stomach and peritonitis, following poisoning by hydrochloric acid, which had eaten a hole through the stomach. The jury returned a verdict of "Death from misadventure."—*Morning Leader.*

### CHILD POISONED BY ACETIC ACID.

On February 16, Mr. Proud, coroner, held an inquest at the Grey Horse Inn, Bank Top, Darlington, concerning the death of Wm. Appleton, a little boy about 4½ years of age, who died from drinking acetic acid.—The evidence of the mother, Mary Appleton, living in Smithfield Street, was to the effect that on Tuesday morning deceased was sent upstairs to the bedroom; that soon afterwards she heard a scream, and found that deceased had uncorked a bottle and drank some of the contents, consisting of acetic acid. She gave him an emetic, which operated, and later Dr. Gardiner was called in, but the child died on the following day. The witness stated that the acetic acid had been in the drawer for four years, and she had forgotten it was there. A verdict was returned that deceased died from the effects of accidentally taking acetic acid.—*Middlesboro' Daily Gazette.*

### PROSECUTION UNDER THE FOOD AND DRUGS ACT.

On February 7, before the Bradford Borough Bench, Edgar Augustus Sewell, chemist, Bradford Road, Frizinghall, was proceeded against by the Bradford Corporation for an infringement of the statute for the prevention of adulteration of articles of consumption by selling a quantity of sweet spirits of nitre which was not of the strength prescribed by the British Pharmacopœia.

Inspector Rhodes proved that on December 28 he purchased 8 ounces of sweet spirits of nitre at defendant's shop for 1s. 9d. This he divided into three parts, one of which he left with the defendant, another he sent to the public analyst, and the third he retained.

F. M. Rimmington, public analyst, proved the deficient strength of the drug supplied to him. He doubted whether the necessary degree of spirits of ether was ever present in the drug.

The defendant, in reply, said there was no intention to defraud on his part. He sold the drug as he purchased it, from a respectable firm; but the ether evaporated every time the bottle was opened, and it was an old bottle the officer was served from.

The defendant was fined £1, with 18s. costs.—*Bradford Observer.*

### POISONING BY POPPYHEADS.

An inquiry was recently held at Tottenham Hospital, by Mr. Alfred Hodgkinson, deputy coroner, with reference to the death of Edith May Jones, aged ten months, the daughter of a butcher, of 2, Egan Terrace, Broad Lane, South Tottenham.

George Thomas Jones, the father, stated that the child had been suffering from its teeth, and his wife purchased a poppyhead, and with a half-pint of boiling water she made a mixture, and gave the child one tablespoonful, and another tablespoonful four hours after. The child almost immediately became unconscious, and died the next day.

Dr. William Milligan, of High Road, Lower Tottenham, deposed that death was due to coma, produced by opium poisoning. The dose the child had been given was most dangerous, in fact, a poppyhead was not meant for inward application at all. The jury returned a verdict of "Death from opium poisoning, the result of misadventure."—*Echo.*

### DEATH FROM OVERDOSE OF OPIUM.

The Borough Coroner (Mr. Rowland Taylor) held an inquest at York Street Tavern, Bolton, on February 19, into the circumstances attending the death of James Gleeson, labourer, 37 years of age, of 48, Back York Street, who was found dead in bed on Sunday morning. He had purchased a pennyworth of opium at a neighbouring chemist's shop, and was warned to take only three grains at once. He went home, and swallowed a piece about the size of an ordinary pill, and next morning was found dead by his wife. He had not been in the habit of taking opium.

Percy D. Page, chemist and druggist, and manager for Mr. H. B. Pare, 204, Bridgeman Street, deposed to selling the opium to deceased, as he satisfied witness that he wanted it for a legitimate purpose. He gave him instructions as to the amount to take, labelled the opium "poison," and believed he had acted quite within his rights in what he had done.

The Coroner: Oh, yes, certainly.

Dr. Scowcroft said that there was no doubt that deceased had died from the effects of an overdose of opium.

The Coroner said that the druggist had taken every precaution, and there was no blame whatever attachable to him. He did not think it advisable to sell opium to that class of persons.

A verdict that "Death was the result of an excessive dose of opium" was returned by the jury.—*Bolton Daily Chronicle.*

## Reviews and Notices of Books.

### LES PRODUITS CHIMIQUES EMPLOYÉS EN MÉDECINE. By A. TRILLAT, with introduction by P. SCHUTZENBERGER.[*]

The substances dealt with in this book are antiseptics, hypnotics, etc., derived from the fatty and aromatic series of organic compounds. The first part of the work is devoted to a historical introduction, followed by chapters on the classification and value of antiseptics, methods of sterilisation, and culture media. Part two includes information regarding ether and its derivatives, chloroform, chloral, sulphonal, etc., etc., and part three is reserved for the consideration of creolins, naphthalin, phenol, thymol, resorcin, guaiacol, benzoic and salicylic acids, antifebrin, saccharin, antipyrin, and many allied substances. The analytical characters of the various products described are given in tabular form at the end of the volume. The book should prove very useful to medical men and pharmacists desirous of informing themselves regarding the composition, manufacture, etc., of the numerous synthetic remedies in common use.

### LONDON MEDICAL DIRECTORY FOR 1894.[†]

This is the sixth issue of the present work, and covers the districts extending from Hounslow West to Barking East, and from Croydon South to Barnet North. Each name given in the list is followed by the full qualifications of the individual, his past and present posts, and a list of his publications, exceptional care having been taken to ensure the absolute correctness of this matter. There is also a streets list, and much information of use to medical practitioners is included in the work.

### FORMULAIRE DES ALCALOÏDES ET DES GLUCOSIDES. By H. BOCQUILLON-LIMOUSIN, with an introduction by G. HAYEM.[‡]

A mass of usually scattered information regarding alkaloids and glucosides is here embodied in a compact form. Information is first given regarding general and special processes of preparation, reactions, classification, etc., then the name, synonym, source, description, properties, reactions, etc., of each alkaloid or glucoside are briefly recorded, both natural and artificial compounds being described. The book is intended as a convenient practical guide to medical practitioners and pharmacists dealing with the complexities of modern pharmacology.

### NOTES ON NURSING IN EYE DISEASES. By C. S. JEAFFRESON, M.D., F.R.C.S.E.[*]

In this little book the author has described the applications and methods used by him, as the results of his own experience. The uses and different kinds of eye bandages, pads, and shades are mentioned in detail, as well as blisters, setons, poultices, lotions, drop bottles, etc., illustrations serving to make the text clearer where necessary. Later chapters deal with iridectomy, strabismus, infectious cases, massage, electricity, instruments, and solutions in constant use. Finally, several pages are devoted to illustrations of the various instruments and appliances used in eye affections. The descriptive portion of the book is very concisely written, and should be readily comprehended by nurses and others interested in the subject.

## Obituary.

Notice has been received of the death of the following:—

On January 20, Benjamin William Price, Chemist and Druggist, of Redhill, Surrey. (Aged 53 years).

On January 25, Henry Dyer, Chemist and Druggist, of Trowbridge. (Aged 90 years).

On January 28, William John Lloyd, Chemist and Druggist, of Aldershot. (Aged 50 years).

On January 31, Davies Rees, Chemist and Druggist, of Bridgend, Glam. (Aged 35 years).

On February 6, Charles Thomas Raynor, Chemist and Druggist, of Derby. (Aged 44 years).

On February 7, Peter Theodore Parker, Chemist and Druggist, of Adwalton, Yorks. (Aged 44 years).

On February 17, Alexander Rose, Chemist and Druggist, of Glasgow. Mr. Rose had been a member of the Society since 1871.

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### MEDICAL MEN AND PHARMACISTS.

Sir,—Fifteen years ago the members of the medical profession practising in Margate agreed to relinquish the practice of dispensing medicines, believing, in accordance with the view so often expressed in your columns, that in so doing the custom of prescribing over the counter by pharmaceutical chemists would become a thing of the past. We regret that not only have our expectations failed to be realised, but that the abuse is increasing year by year. We have no desire to occupy your space by giving detailed instances of the practice of which we complain, but need scarcely say that it would be an easy matter to give chapter and verse if challenged to do so. We have no wish to control the sale of laxative or astringent mixtures, of "liver" pills, hair restorers, or domestic remedies demanded by the public and very properly supplied by the retailer. But we think that the business has its definite limits, and that such limits are transgressed by a pharmacist who enters into the details of a case, cross-examines the patient or the patient's representative, and readily furnishes diagnosis, prognosis, and treatment, a treatment which is continued until it is crowned with success, or until its failure urges the patient to seek the advice of a qualified member of the medical profession. We write to you, sir, believing that you uphold a high standard of the duties of a pharmacist and of their limits, and ask you for an expression of opinion on the relations which should exist between the prescribing chemist and the non-dispensing doctor, and what remedy you can suggest for a state of things which is becoming intolerable.

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[*] Paris: J. B. Baillière et fils. Pp. 415, with 67 illustrations. 5 fr.

[†] London: Kelly and Co., Limited. Pp. i.-xxiii., 1 to 472. 6s. 6d.

[‡] Paris: J. B. Baillière et fils. Pp. i.-viii., 1 to 318, 8 fr.

[*] Bristol: John Wright and Co. Pp. 90. 2s. 6d.

THE HONORARY SECRETARY,
*On behalf of the Margate Medical Society.*

### PAPAIN DIGESTION.

Sir,—Dr. Gordon Sharp's interesting paper published in a recent issue is instructive, but I am of opinion his failure to find peptone may possibly be accounted for by the samples of papain employed in his researches. I am the more inclined to favour this opinion because in my own work papain obtained from various sources gave very different results. I wish it to be distinctly understood I do not favour one make of papain in lieu of another, as possibly might be thought by Mr. Parry's remarks at the Conference *re* "different motives of the authors." My only desire is that if papain is to be employed medicinally we must have a reliable product, and not a substance which at one time will produce deutero-albumose and at another peptone. Some uncertainty appears also to exist with regard to the plant *Carica Papaya*—I mean as to its identity. Since last August I have been in communication with several gentlemen abroad, who appear to differ materially, not only in the description of the plant, but also in the powers which it is said to possess. One gentleman in Singapore, an officer in Her Majesty's Army, states that it is impossible to use the leaves as soap in laundry work, and he has seen cases where the flesh of the fingers of women using the leaves has been absolutely destroyed owing to the caustic effects of the juice. Another gentleman, equally reliable, states that cattle permitted to graze beneath the trees quickly lose their well-favoured appearance, and if not removed, rapidly die, although means have been taken to prevent them partaking of the leaves or any portion of the trees. Further reports from the West Indies state that the fruit is eaten as dessert in small quantities, but if indulged in too freely griping pains in the umbilical region are produced, but that the leaves are frequently employed by the natives in laundry work without disastrous results. This, I think, would tend to prove that the soil in which the plants grow may have some effect upon the finer developed, either mitigating or increasing its active principles, similar to *Cannabis sativa* grown in Indian or in English soil. It is possible also that hybridisation may account in some measure for these differences. Dr. Sharp mentions accidental bacteria. My experiments were conducted in closed vessels, but these were not sterilised. It is therefore possible that peptone may have been developed by these. But even if such were the case, as I understand Dr. Sharp's vessels were not sterilised, it is the more remarkable he obtained no peptone. In conclusion, I may add I have a quantity of the fruits preserved in glycerin arriving shortly, also a parcel of dried leaves from Singapore, and after further experiments I shall be pleased to give details.

*London.* FREDERICK DAVIS.

### METHYLATED SPIRIT.

Sir,—With respect to caution about methylated spirit, Mr. Bottle should give his experiments in detail. Over and over again when the matter has been gone into, accidents said to be through explosion of methylated spirit have been traced to benzole compounds. The percentage of mineral naphtha in methylated spirit being only three-eighths of one per cent., it is hard to believe deleterious effects come from this. The public are continually being impressed that methylated spirit is as dangerous as petroleum. It is nothing of the sort. A lighted match can be laid across the mouth of a 2-drachm, long-necked vial, filled up to the shoulder with mineralised methylated spirit, left there to burn thirty seconds without igniting the spirit at all; the writer has just done it before writing these concluding remarks. He has many a time placed a light over a bottle of his methylated spirit and found he has to place it in very close proximity indeed to ignite it; also for experiment he has frequently lit methylated spirit and let it burn for some seconds in a wine-glass without its cracking the glass. Of course it would do so if left for a longer time.

A METHYLATED SPIRIT MANUFACTURER.

### METHYLATED SPIRIT.—A CAUTION.

Sir,—Seeing Mr. Bottle's letter in the Journal, recalls to my mind an accident that occurred at Christmas to a nurse who had to use a spirit lamp in the night. She lit the lamp and placed it on the table, when it suddenly flared up, burning her face and hands so badly that she had to be removed to a hospital. If the spirit is as dangerous as Mr. Bottle points out, I trust the Inland Revenue department will be induced to alter their order before we have more serious accidents from it.

*St. Pancras Parish Dispensary.* W. E. MILLER.

### JALAP AND JALAPIN.

Sir,—In answer to Mr. J. C. Stead's inquiries, I beg to say that I worked upon powdered jalap, and not tubercles, and that as the samples were examined with a view to seeing if they came up to the B.P. standard, they were treated as directed in the B.P. The alcoholic extract was washed repeatedly and thoroughly in hot water until nothing more was removed, the washings passed through a filter, the filter washed with water, and any adhering resin washed through with spirit. Mr. Stead suggests that either specially picked samples were used or that the extracts were imperfectly washed. Neither was the case. If he refers to my paper, he will see that I stated that I obtained my samples from retail shops, and I may add that care was taken that the results should be accurate. With reference to the large percentages of resin, 16·9 and 17·7, check experiments yielded 17·0 and 17·48 respectively. On leaving the Square at Christmas, I threw all the samples away, otherwise I should have been pleased to forward them to Mr. Stead, in order that he might check my results.

*London, W.* CHARLES E. ROBINSON.

### ACARI.

Sir,—Referring to your most interesting report of the Royal Microscopical Society, and the wonderful advances in the knowledge of natural history narrated by the president, I am reminded of long past events. It is over fifty years since Mr. Crosse and Mr. H. W. Weekes prosecuted their first experiments in aerial electricity, and to their mutual astonishment noticed that certain living organisms made their appearance in fluids subjected to continuous mild streams of electricity, and although every precaution was taken to prevent the access of atmospheric air, the little active pellucid creatures continued to appear—there could be no connection, as one gentleman resided in Yorkshire, the other at Sandwich, Kent. The announcement of the fact, however, had the effect of raising a violent storm of clerical indignation; the two philosophers were denounced as bold, bad men, who had assumed the prerogative of creative power. Their consolation was that a future day would explain the facts or vindicate their character. I should be glad to know whether the *Acarus Crossi* is included in the 212 genera of Trouessant, having enjoyed the friendship of Mr. Weekes and participated in his important labours.

*Kingston-on-Thames.* R. GOODWIN MUMBRAY.

### Starch in Scammony.

Sir,—The opinion expressed by Mr. Umney at the last evening meeting, that starch is met with in but small quantities in commercial scammony, and should not be regarded as an adulteration, is hardly supported by the analysis of a specimen which came into my hands last week. The decoction of this sample gave an intense blue colour with iodine, and after extraction with ether the residue appeared under the microscope to consist almost entirely of starch. As far as could be ascertained the scammony was exactly as imported, and doubtless many of the low-priced and inferior scammonys offered on the London market are sophisticated in a similar manner. I enclose a portion of the residue for your inspection.

15, *Laurence Pountney Lane, E.C.* F. C. J. Bird.

⁂ The powder received consists chiefly of starch, strongly resembling that of wheat, the granules being circular and flat, with central hilum and concentric rings, and measuring from 2 μ to 55 μ. One exceptionally large granule, however, was 80 μ in diameter. The markings are much more distinct than generally seen in the case of wheat starch, though even in the present instance they are only evident in a limited proportion of the granules.—[Ed. *Pharm. Journ.*].

## Answers to Correspondents.

*Alpha.*—If such a practice exists, it is distinctly illegal, and notification to the Inland Revenue authorities would doubtless lead to its speedy repression.

*S. R. Downie.*—According to Section XVI. of the Pharmacy Act, 1868, nothing in the earlier part of the Act extends to or interferes "with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing," and again, in Section XVII., it is stated that "the provisions of this Section . . . shall not apply . . . to sales by wholesale to retail dealers in the ordinary course of wholesale dealing."

## Notices of Meetings next Week.

### Monday, February 26.

*London Institution*, at 5 p.m.
"The Chemistry of Cleaning," by Professor Vivian Lewes.

### Tuesday, February 27.

*Photographic Society of Great Britain*, at 8 p.m.
"A Method of Modifying Platinum Prints by After-treatment," by Alfred W. Dollond.
*Royal Institution*, at 8 p.m.
"Locomotion and Fixation in Plants and Animals" (seventh lecture), by Professor C. Stewart.

### Thursday, March 1.

*Royal Institution*, at 3 p.m.
"The VedÂnta Philosophy," by Professor Max Müller.
*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
"The Comparative Anatomy of the Respiratory Organs," by J. Rankin.
*Linnean Society of London*, at 8 p.m.
"Algological Notes from Cumbrae; on the Origin of the Filamentous Thallus of Dumontia filiformis," by George Brebner.
"Entomostraca and the Surface Film of Water," by D. J. Scourfield.
*School of Pharmacy Students' Association*, at 7 p.m.
"Lead and its Salts," by H. Boyce.
"Paper Manufacture," by A. C. Bateson.
*Chemists' Assistants' Association*, at 8.30 p.m.
"Œsypum and Lanolin," by T. H. Heap.
*Chemical Society*, at 8 p.m.
"Ærial Oxidation of Terpenes and Essential Oils," by C. T. Kingzett.
*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Milk Analysis," by R. C. Cowley.

### Friday, March 2.

*Royal Institution*, at 9 p.m.
"The Theory of the Cochlea and Inner Ear," by Professor J. G. McKendrick.

### Saturday, March 3.

*Royal Institution*, at 3 p.m.
"Light" (fourth lecture), by Lord Rayleigh.
*Pharmaceutical Football Club v.* The Breweries, at Shepherd's Bush, at 3 p.m.

## Books, etc., received.

Rocznik Farmaceutyczny. 1892. Edited by Adama Jaworowskiego. Warsaw, 1894. Pp. 192. From the Editor.

Jaaroverzichten betreffende den Handel in Koloniale Producten, 1893. Pp. 103. Amsterdam: J. H. de Bussy. From the Publisher.

Second Systematic Census of Australian Plants, with Chronologic, Literary, and Geographic Annotations. Part 1, Vasculares. By Baron Ferdinand von Mueller, K.C.M.G., M.D., Ph.D., F.R.S., etc. Pp. 244. Melbourne: McCarron, Bird and Co. From the Author.

Formulaire des Alcaloïdes et des Glucosides. Par Henri Bocquillon-Limousin. Pp. i.-viii., 1 to 313. 3 francs. Paris: J. B. Baillière et Fils. From the Publishers.

The Alchemical Essence and the Chemical Element. By M. M. Pattison Muir. Pp. 94. 4s. 6d. London: Longmans, Green, and Co. From the Publishers.

Handwörterbuch der Pharmacie. Edited Von A. Brestowski. Parts 13 and 14. L. to Magnesium, and Magnesium-acetat to Mineralwasser. 2m. 40 Pf. each part. Vienna and Leipsic: Wilhelm Braumüller. From the Publisher.

Minutes, Reports, Papers, and Discussions of the Forty-first Annual Meeting of the American Pharmaceutical Association, held at Chicago, August 14 to 20, 1893. Pp. 365. Philadelphia: American Pharmaceutical Association. From the Publishers.

Kelly's London Medical Directory for 1894. Pp. i.-xxiii., 1 to 472. 6*s.* 6*d.* London: Kelly and Co., Limited. From the Publishers.

Preliminary Survey of Eucalyptus Oils of Victoria. By W. Percy Wilkinson. Pp. 16. Reprinted from the Proceedings of the Royal Society of Victoria. Melbourne: Ford and Son. From the Author.

Les produits chimiques employés en medicine (serie grasse et serie aromatique) chimie analytique et industrielle. By Auguste Trillat, with an Introduction by P. Schutzenberger. Pp. 415, with 67 figures in the text. 5 francs. Paris: J. B. Baillière et Fils. From the Publishers.

Proceedings of the Eleventh Annual Meeting of the Michigan State Pharmaceutical Association, held at St. Clair Flats, June 19-22, 1893. Pp. 78. Battle Creek, Mich.: Review and Herald Publishing Company. From the Association.

Notes on Nursing in Eye Diseases. By C. S. Jeaffreson, M.D., F.R.C.S.E. Pp. 90. 2s. 6d. Bristol: John Wright and Co. From the Publishers.

Physician's Appointment Calendar, 1894. London: Burroughs, Wellcome and Co. From the Publishers.

Pharmaceutical Register of Victoria for 1893. Pp. 12. 2*s.* 6*d.* Melbourne: H. Hearne and Co. From the Pharmacy Board of Victoria.

Studier öfver transitorisk albuminuri hos till utskendet friska personer. By Thorbjörn Hwass, Med. Dr., Docent Stockholm. Supplement to the 'Nordiskt Medicinskt Arkiv.' Pp. 176, with Charts. Stockholm: P. A. Norstedt and Sons. From the Publishers.

Calendar of the Pharmaceutical Society of Ireland for 1894. Pp. i.–x., 1 to 187. 1s. Dublin: Charles Chambers. From the Society.

*Errata.*—In some copies of last week's Journal certain printer's errors appeared in the report of the Powell's balsam case at Derby, the defendant's name being spelt *Arnison* instead of *Armson*, whilst those of the medical witnesses for the defence appeared as *Drewitt* and *Sands* instead of *Druitt* and *Sang*.

Communications, Letters, etc., received from Messrs. Eardley, Hebbeler, Hill, Lowther, Moss, Thompson.

# BENEVOLENT FUND.

## *STATEMENT OF RELIEF GRANTED DURING* 1893.

### ANNUITANTS.

| | | | | | | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 Annuitants | @ | £50 per annum | for 4 quarters | ... | | 1850 | 0 | 0 | | | |
| 6 do. | @ | £40 | do. | do. | ... | 240 | 0 | 0 | | | |
| 1 Annuitant | @ | £50 | do. | 2 quarters | ... | 25 | 0 | 0 | | | |
| 1 do. | @ | £50 | do. | 1 quarter | ... | 12 | 10 | 0 | | | |
| 2 Annuitants | @ | £40 | do. | do. | ... | 20 | 0 | 0 | | | |
| 1 Annuitant | @ | £40 | do. | 2 quarters | ... | 20 | 0 | 0 | | | |
| | | | | | | | | | **2167** | **10** | **0** |

*Total number of Annuitants during the year* ... **47**

### TEMPORARY GRANTS.

| | £ | s. | d. |
|---|---|---|---|
| Amount granted in **51** cases after investigation by the Committee ... | **578** | **0** | **0** |
| *Total amount of Relief granted during* 1893 ... | **£2745** | **10** | **0** |

ABSTRACT OF RULES IN REFERENCE TO VOTES AT THE ELECTIONS OF ANNUITANTS

Annual Subscribers of—

| | |
|---|---|
| Half-a-crown are entitled at each election of Annuitants to | ONE Vote. |
| Five Shillings ... | TWO Votes. |
| Half-a-guinea ... | FIVE Votes. |
| One Guinea ... | TEN Votes. |

*And to increase in the same proportion.*

Donors of—

| | |
|---|---|
| Five Guineas are entitled to ... | FIVE Votes for life. |
| Ten Guineas ... | TEN Votes for life. |

*And to increase in the same proportion.*

*Should any Subscriber or Donor, or the widow of any Subscriber or Donor, become a Candidate for an annuity, such number of votes shall be placed to his or her credit, at the first succeeding election, as shall be represented by the whole amount of subscriptions or donations to the Benevolent Fund he or she (or, in the case of a widow, her husband) may have contributed.*

# ORPHAN FUND

OF THE

# PHARMACEUTICAL SOCIETY OF GREAT BRITAIN

(FOUNDED BY THOMAS HYDE HILLS, 1891.)

For securing the admission of Orphans of Members and Associates of the Society who were subscribers to the Benevolent Fund for 3 years and upwards into Orphan Schools or Asylums.

Subscriptions and donations to this Fund are invited. Donations and legacies are invested, and the income derived therefrom, together with such portion of the Annual Subscriptions as may be deemed necessary, are devoted to the object contemplated by the late Mr. Hills.

## Legacy and Donations which have been received.

| | £ | s. | d. |
|---|---|---|---|
| Thomas Hyde Hills (Legacy) | 1000 | 0 | 0 |
| John Robbins | 150 | 0 | 0 |
| Elias Bremridge | 105 | 0 | 0 |
| Isaiah Bourdas | 50 | 0 | 0 |
| Guarantors of Edinburgh Committee B.P.C. | 5 | 5 | 0 |
| William Pickard | 2 | 10 | 0 |

## Subscriptions received during 1893.

| | | | |
|---|---|---|---|
| Anonymous | 0 | 10 | 0 |
| Adams, William | 0 | 10 | 6 |
| Allen, Charles Bowen | 1 | 1 | 0 |
| Blunt, T. Porter | 1 | 1 | 0 |
| Bottle, Alexander | 1 | 1 | 0 |
| Butt, E. Northway | 2 | 2 | 0 |
| Carteighe, Michael | 1 | 1 | 0 |
| Crook, George | 0 | 5 | 0 |
| Cross, W. Gowen | 1 | 1 | 0 |
| Hampson, Robert | 1 | 1 | 0 |
| Harrison, John | 0 | 10 | 6 |
| Hills, Walter | 1 | 1 | 0 |
| Long, Henry | 0 | 10 | 6 |
| Martindale, Wm. | 1 | 1 | 0 |
| Newsholme, G. T. W. | 0 | 10 | 6 |
| Payne, J. B. | 0 | 5 | 0 |
| Salter, Benjamin | 0 | 10 | 6 |
| Southall Brothers & Barclay | 1 | 1 | 0 |
| Turner, E. Anstee | 0 | 10 | 0 |
| Young, J. Rymer | 1 | 1 | 0 |

# BENEVOLENT FUND.

# LOCAL LIST OF SUBSCRIPTIONS & DONATIONS

RECEIVED DURING 1893.

| **Aberavon.** | £ | s. | d. |
|---|---|---|---|
| Loveluck, G. D. | 0 | 2 | 6 |
| **Aberchirder.** | | | |
| Smith, W. M. | 0 | 2 | 6 |
| **Aberdare.** | | | |
| Jones, D. W. | 0 | 5 | 0 |
| Smith, Morgan | 0 | 2 | 6 |
| **Aberdeen.** | | | |
| Andrews, W. | 0 | 2 | 6 |
| Black, R. | 0 | 5 | 0 |
| Bruce, A. L. | 0 | 2 | 6 |
| Clark, J. | 0 | 5 | 0 |
| Coutts, C. | 0 | 5 | 0 |
| Craig, A. | 0 | 5 | 0 |
| Cruickshank, Geo. P. | 0 | 5 | 0 |
| Cruikshank, J. | 0 | 5 | 0 |
| Davidson, Charles | 1 | 1 | 0 |
| Davidson, W. | 0 | 5 | 0 |
| Dugan, A. F. | 0 | 5 | 0 |
| Dunn, J. | 0 | 5 | 0 |
| Fearnside, J. | 0 | 5 | 0 |
| Giles, William | 0 | 5 | 0 |
| Gordon, William | 0 | 5 | 0 |
| Gordon, W. G. | 0 | 5 | 0 |
| Innes, J. | 0 | 5 | 0 |
| Johnston, John | 1 | 1 | 0 |
| Kay, H. G. | 0 | 10 | 6 |
| Kay, James P. | 0 | 10 | 6 |
| Kemp, James | 0 | 2 | 6 |
| Levack, D | 0 | 5 | 0 |
| Mortimer, D. A. | 0 | 5 | 0 |
| Paterson, J. | 0 | 5 | 0 |
| Paterson, W. & Sons | 0 | 10 | 6 |
| Reid, W. | 0 | 5 | 0 |
| Ritchie, D. | 0 | 5 | 0 |
| Shepherd, A. M. | 0 | 5 | 0 |
| Simpson, C. | 0 | 5 | 0 |
| Spence, J. | 0 | 5 | 0 |
| Strachan, Alexander | 0 | 5 | 0 |
| Wallace, W. | 0 | 5 | 0 |
| Weir, A. S. | 0 | 5 | 0 |
| **Aberfeldy.** | | | |
| Macnaughton, H. B. | 1 | 1 | 0 |
| **Abergavenny.** | | | |
| Pryer, Henry | 0 | 10 | 6 |
| **Aberystwith.** | | | |
| Ellis, Robert | 0 | 2 | 6 |
| Wynne, Edward P. | 0 | 10 | 6 |
| **Abingdon.** | | | |
| Smith, William F. | 0 | 5 | 0 |
| **Aboyne.** | | | |
| Petrie, James J. | 0 | 5 | 0 |
| **Addington.** | | | |
| Schoon, G. | 0 | 1 | 0 |
| **Addiscombe.** | | | |
| Townsend, Charles | 0 | 10 | 6 |
| **Alcester.** | | | |
| Adcock, H. D. | 0 | 10 | 6 |
| Overbury, Henry | 0 | 5 | 0 |
| **Aldborough (Yorks.).** | | | |
| Andrews, H. A. | 0 | 2 | 6 |
| **Aldeburgh.** | | | |
| Cooper, F. T. | 0 | 2 | 6 |

| **Alderley Edge.** | £ | s. | d. |
|---|---|---|---|
| Knight, R. | 0 | 5 | 0 |
| **Aldershot.** | | | |
| Williams, James | 0 | 10 | 6 |
| **Alexandria (N.B.).** | | | |
| McFarlane, Peter | 0 | 5 | 0 |
| **Alfreton.** | | | |
| Evison, Alfred | 0 | 2 | 6 |
| Robinson, Joseph S. | 0 | 10 | 6 |
| **Alnwick.** | | | |
| Macaulay, D. | 0 | 2 | 6 |
| Newbigin, James L. | 0 | 10 | 6 |
| Newbigin, Lesslie | 0 | 5 | 0 |
| **Alresford.** | | | |
| Richardson, J. H. | 0 | 5 | 0 |
| Willis, William | 0 | 5 | 0 |
| **Alsager.** | | | |
| Guest, G. C. | 0 | 2 | 6 |
| **Altrincham.** | | | |
| Unsworth, J. W. | 0 | 5 | 0 |
| **Ambleside.** | | | |
| Herd Henry W. | 0 | 2 | 6 |
| **Andover.** | | | |
| Bienvenu, John | 0 | 10 | 0 |
| Gradidge, W. T. | 0 | 5 | 0 |
| **Annan.** | | | |
| Crail, J. | 0 | 5 | 0 |
| **Arbroath.** | | | |
| Burn, David H. | 0 | 5 | 0 |
| Naysmith, Andrew | 0 | 5 | 0 |
| Robertson, John | 0 | 5 | 0 |
| Shield, Mill and Jack | 0 | 5 | 0 |
| Whyte, J. S. | 0 | 5 | 0 |
| **Arlesley.** | | | |
| Kent, T. W. | 0 | 5 | 0 |
| **Arundel.** | | | |
| Neale, M. H. | 0 | 5 | 0 |
| **Ashbourne.** | | | |
| Bradley, Edwin Sylvester | 0 | 10 | 6 |
| Greaves, Frederick W. | 0 | 5 | 0 |
| Osborne, James | 0 | 5 | 0 |
| Reckless, A. H. | 0 | 5 | 0 |
| **Ashby-de-la-Zouch.** | | | |
| Bullen, George W. | 1 | 1 | 0 |
| **Ashford (Kent).** | | | |
| Brothers, John | 1 | 1 | 0 |
| Forth, W. P. | 0 | 5 | 0 |
| Ingall, Joseph | 1 | 1 | 0 |
| Stedman, F. W. | 0 | 5 | 0 |
| White, Charles Thomas | 0 | 5 | 0 |
| **Ashton-under-Lyne.** | | | |
| Belfield, William | 0 | 5 | 0 |
| Bostock, J. W. | 0 | 5 | 0 |
| Bostock, William | 1 | 11 | 6 |
| Eastwood, W. | 0 | 2 | 6 |
| Hall, J. | 0 | 2 | 6 |
| Hill, D. C. | 0 | 5 | 0 |
| Phillips, J. J. | 0 | 5 | 0 |
| Sharp, S. | 0 | 5 | 0 |
| Waterhouse, J. and Co. | 0 | 10 | 6 |

| **Ashwell.** | £ | s. | d |
|---|---|---|---|
| Harrison, G. W. | 0 | 5 | 0 |
| **Atherton.** | | | |
| Fletcher, Ellis | 0 | 5 | 0 |
| Heywood, John H. | 0 | 10 | 6 |
| Stothert, J. | 0 | 5 | 0 |
| **Atherstone.** | | | |
| Orme, Mrs. M. | 0 | 5 | 0 |
| **Attleborough.** | | | |
| Muskett, F. J. | 0 | 2 | 6 |
| **Auchterarder.** | | | |
| Dougall, W. R. B. | 0 | 5 | 0 |
| **Axminster.** | | | |
| Parsons, H. I. | 0 | 2 | 6 |
| **Aylesbury.** | | | |
| Dickins, Rowland | 0 | 10 | 6 |
| Palmer, Edwin T. | 0 | 5 | 0 |
| Surfleet, W. | 0 | 5 | 0 |
| **Aylsham.** | | | |
| Hill, John | 0 | 2 | 6 |
| **Ayr.** | | | |
| Jackson, W. M. | 0 | 5 | 0 |
| **Bagshot.** | | | |
| Copestake, H. H. | 0 | 5 | 0 |
| **Bakewell.** | | | |
| Carrington, Edward G. | 0 | 5 | 0 |
| **Baldock.** | | | |
| Parkes, A. V. | 0 | 2 | 6 |
| Peck, G. S. | 0 | 2 | 6 |
| **Banbury.** | | | |
| Bartlett, H. | 0 | 5 | 0 |
| Gilkes, Fredk. G. | 0 | 5 | 0 |
| Hinde, A. H. | 0 | 2 | |
| **Banchory.** | | | |
| Lunan, Alexander | 0 | 5 | 0 |
| **Banff.** | | | |
| Alexander, W. | 0 | 5 | 0 |
| **Bangor.** | | | |
| Jones, Owen | 0 | 5 | 0 |
| Webster, Thomas | 0 | 5 | 0 |
| **Barking.** | | | |
| Ridley, C. H. | 0 | 5 | 0 |
| **Barnard Castle.** | | | |
| York, F. | 0 | 10 | 6 |
| **Barnet.** | | | |
| Hayles, B. H. (New) | 1 | 1 | 0 |
| Thompson, F. | 0 | 2 | 6 |
| Williams, W. | 0 | 10 | 6 |
| Young, R. F. | 0 | 10 | 6 |
| **Barnstaple.** | | | |
| Britton, Wm. B. | 0 | 5 | 0 |
| Goss, Samuel | 0 | 10 | 0 |
| Partridge, James | 0 | 5 | 0 |
| Pratt, Edward | 0 | 5 | 0 |
| Tremeer, J. J. | 1 | 0 | 0 |
| **Barry Dock.** | | | |
| Jones, Joshua, E. | 0 | 7 | 6 |

### Barton-on-Humber.

| | £ | s. | d. |
|---|---|---|---|
| Smith, Richard F. | 0 | 5 | 0 |

### Bazingstoke.

| | | | |
|---|---|---|---|
| Mares, J. | 16 | 5 | 6 |

### Bath.

| | | | |
|---|---|---|---|
| Alcock, Henry | 0 | 5 | 0 |
| Ames, J. C. | 0 | 5 | 0 |
| Appleby, E. J. | 0 | 10 | 6 |
| Bright, W. | 0 | 5 | 0 |
| Capper, Edmund | 0 | 5 | 0 |
| Clarke, B. G. K. | 0 | 2 | 6 |
| Dunn, Richard | 0 | 10 | 6 |
| Gare, G. H. | 0 | 5 | 0 |
| Griffin, Alfred W. | 0 | 5 | 0 |
| Harding, R. O. | 0 | 5 | 0 |
| Marsh, John H. | 0 | 10 | 0 |
| Masters, Henry James | 0 | 5 | 0 |
| Merrikin, John B. | 0 | 10 | 6 |
| Parker, C. | 0 | 2 | 6 |
| Partington, J. J. | 0 | 5 | 0 |
| Sharman, H. B. | 0 | 2 | 6 |
| Sharp, Benjamin | 5 | 5 | 0 |
| Snow, A. L. (Widcombe) | 0 | 2 | 6 |
| Thomas, Henry J. | 0 | 10 | 6 |
| Thring, E. J. H. (Monkton Combe) | 0 | 10 | 6 |
| Tilsley, George | 0 | 10 | 6 |
| Whiston, E. | 1 | 1 | 0 |
| Williams, Mrs. Sophia | 0 | 10 | 6 |
| Wilson, Joseph | 0 | 10 | 6 |

### Batley.

| | | | |
|---|---|---|---|
| Broadhead, R. | 0 | 2 | 6 |

### Batley Carr.

| | | | |
|---|---|---|---|
| Pickles, W. (Donation) | 10 | 10 | 0 |

### Beaumaris.

| | | | |
|---|---|---|---|
| Roberts, W. | 0 | 2 | 6 |
| Slater, John | 1 | 0 | 0 |

### Bebington (Cheshire).

| | | | |
|---|---|---|---|
| Fawcett, J. | 0 | 10 | 6 |

### Beccles.

| | | | |
|---|---|---|---|
| Flower, William | 0 | 5 | 0 |
| Plumbly, Walter | 0 | 2 | 6 |

### Bedale.

| | | | |
|---|---|---|---|
| Swinbank, J. | 0 | 5 | 0 |

### Bedford.

| | | | |
|---|---|---|---|
| Anthony and Biss | 0 | 10 | 0 |
| Cameron, William Alexander | 0 | 5 | 0 |
| Carruthers, E. M. | 0 | 2 | 6 |
| Corrie, A. A. | 0 | 2 | 6 |
| Corrie, Isabella A. | 0 | 5 | 0 |
| Ekins, John | 0 | 10 | 6 |
| Hester, Charles | 0 | 5 | 0 |
| Norman, Joseph S. | 0 | 5 | 0 |
| Taylor, J. B. | 0 | 5 | 0 |
| Thompson, H. | 0 | 5 | 0 |

### Bedlington.

| | | | |
|---|---|---|---|
| Foggan, George | 0 | 5 | 0 |

### Belfast.

| | | | |
|---|---|---|---|
| Green, Thomas | 0 | 5 | 0 |
| Leslie, J. | 1 | 1 | 0 |
| McNaught, A. | 0 | 10 | 6 |
| Yoxall, Henry | 0 | 5 | 0 |

### Belper.

| | | | |
|---|---|---|---|
| Calvert, James | 0 | 5 | 0 |

### Berkeley.

| | | | |
|---|---|---|---|
| Noak, W. F. | 0 | 2 | 6 |

### Berkhampstead.

| | | | |
|---|---|---|---|
| Cooper, W., & Nephews | 1 | 1 | 0 |

### Berwick.

| | | | |
|---|---|---|---|
| Lyle, W. | 0 | 5 | 0 |
| McIntyre, J. | 0 | 5 | 0 |

### Beverley.

| | | | |
|---|---|---|---|
| Fields, T. W. | 0 | 5 | 0 |

### Bexhill.

| | | | |
|---|---|---|---|
| Brisley, George | 0 | 5 | 0 |
| Ingram, F. | 0 | 2 | 6 |

### Bexley Heath.

| | | | |
|---|---|---|---|
| Mason, Alfred J. | 0 | 5 | 0 |

### Bicester.

| | | | |
|---|---|---|---|
| Bates, John | 0 | 5 | 0 |
| Coleman, T. | 0 | 10 | 6 |

### Bideford.

| | £ | s. | d. |
|---|---|---|---|
| Betty, S. C. | 0 | 5 | 0 |
| Hogg, Mrs. Mary | 0 | 5 | 0 |

### Biggar.

| | | | |
|---|---|---|---|
| Eunson, J. | 0 | 2 | 6 |

### Biggleswade.

| | | | |
|---|---|---|---|
| Spong, D. M. | 0 | 5 | 0 |

### Birkenhead.

| | | | |
|---|---|---|---|
| Ainley, E. T. | 0 | 5 | 0 |
| Barber, George | 0 | 10 | 6 |
| Bascombe, W. | 0 | 6 | 0 |
| Botwood, C. W. | 0 | 10 | 6 |
| Breeze, J. A. E. | 0 | 5 | 0 |
| Brookes, A. F. | 0 | 5 | 0 |
| Dutton, H. O. | 1 | 1 | 0 |
| Dutton, John | 0 | 10 | 6 |
| Ellithorne, A. H. | 0 | 10 | 6 |
| Field, H. E. (Executors of) | 0 | 5 | 0 |
| Fowler, Geo. | 0 | 5 | 0 |
| Jennings, W. H. (West Kirby) | 0 | 5 | 0 |
| Kenway, D. | 0 | 2 | 6 |
| Walker, J. | 0 | 5 | 0 |

### Birmingham.

| | | | |
|---|---|---|---|
| Adam, Frederick | 0 | 5 | 0 |
| Adams, W. | 0 | 5 | 0 |
| Arblaster and Churchill | 1 | 1 | 0 |
| Asten, W. | 0 | 2 | 6 |
| Atkins, W. S. | 0 | 10 | 6 |
| Ayris, H. C. | 0 | 2 | 6 |
| Barker, Thomas | 0 | 10 | 6 |
| Barrass, T. E. | 0 | 5 | 0 |
| Bates, J. | 0 | 5 | 0 |
| Bayley, R. | 0 | 10 | 6 |
| Bellamy and Wakefield | 1 | 1 | 0 |
| Bird, Alfred | 1 | 1 | 0 |
| Blackbourne, A. | 0 | 5 | 0 |
| Blackwell, J. | 0 | 5 | 0 |
| Boucher, H. | 0 | 5 | 0 |
| Bradley, F. | 0 | 10 | 6 |
| Brady, B. F. | 0 | 10 | 6 |
| Branford, J. G. | 0 | 2 | 6 |
| Brassington, W. R. | 0 | 2 | 6 |
| Brunt, G. H. | 0 | 5 | 0 |
| Campson, R. | 0 | 2 | 6 |
| Cattell, J. T. | 0 | 2 | 6 |
| Cattell, T. B. | 0 | 2 | 6 |
| Chapman, T. W. | 0 | 5 | 0 |
| Chase, Thomas | 1 | 1 | 0 |
| Chesterton, W. P. | 0 | 10 | 6 |
| Clayton, Francis Corder | 1 | 1 | 0 |
| Corfield, & Corfield | 1 | 1 | 0 |
| Cornforth, Edwin | 0 | 2 | 6 |
| Critchlow, H. | 0 | 2 | 6 |
| Cross and Son | 0 | 5 | 0 |
| Cuthbertson, E. T. | 0 | 2 | 6 |
| Evans, J. C. | 0 | 2 | 6 |
| Evans, W. B. | 0 | 2 | 6 |
| Foster, Alfred H. (Executors of) | 0 | 5 | 0 |
| Foster, James Alfred | 0 | 5 | 0 |
| Frobisher, F. (Selly Oak) | 0 | 5 | 0 |
| Gibson, F. T | 0 | 10 | 6 |
| Greatrex, H. | 0 | 5 | 0 |
| Green, W. H. | 0 | 2 | 6 |
| Grieves, A. S. | 0 | 5 | 0 |
| Griffin, J. F. | 0 | 2 | 6 |
| Ground, T. | 0 | 5 | 0 |
| Harris, P. and Co. | 1 | 1 | 0 |
| Hasleton, C. J. | 0 | 5 | 0 |
| Heath, W. E. | 0 | 2 | 6 |
| Hedges, W. R. | 2 | 2 | 0 |
| Hemming, W. H. | 0 | 2 | 6 |
| Hodgetts, N. | 0 | 2 | 6 |
| Horner, F. G. | 0 | 2 | 6 |
| Horton, G. D. | 0 | 10 | 0 |
| Horton, J. J. | 0 | 5 | 0 |
| Jarvis, C. F. | 0 | 5 | 0 |
| Knight, G. T. | 0 | 2 | 6 |
| Leah and Willdey | 0 | 2 | 6 |
| Lowther, T. W. | 0 | 5 | 0 |
| Luckman, C. | 0 | 5 | 0 |
| Mackenzie, J. C. | 0 | 10 | 6 |
| Magor, M. | 0 | 10 | 6 |
| Mantell, Charles | 0 | 10 | 6 |
| Mantell, Charles, jun. | 0 | 10 | 6 |
| Morris Banks and Co. | 1 | 1 | 0 |
| Naish, C. E. | 0 | 10 | 6 |
| Onion, J. | 0 | 5 | 0 |
| Page, C. | 0 | 5 | 0 |
| Peck, T. W. | 0 | 2 | 6 |
| Pennistone, W. | 0 | 2 | 6 |
| Perry, George E. | 0 | 10 | 6 |
| Place, E. B. | 0 | 2 | 6 |
| Poole, J. | 0 | 5 | 0 |

### Birmingham—continued.

| | £ | s. | d. |
|---|---|---|---|
| Price, W. | 0 | 5 | [illegible] |
| Prosser, Frank H. | 0 | 10 | [illegible] |
| Radford, J. A. | 0 | 10 | [illegible] |
| Reedman, W. H. | 0 | 5 | [illegible] |
| Reeve, T. L. | 0 | 5 | [illegible] |
| Richards, F. J. | 0 | 10 | [illegible] |
| Roberts and Son | 0 | 5 | [illegible] |
| Selby, J. | 0 | 2 | [illegible] |
| Simmons, A. | 0 | 5 | [illegible] |
| Smith, A. N. | 0 | 2 | [illegible] |
| Southall, A. W. | 0 | 5 | [illegible] |
| Southall Bros. and Barclay | 1 | 1 | [illegible] |
| Sparshot, H. | 0 | 5 | [illegible] |
| Spencer, J. | 0 | 10 | [illegible] |
| Thompson, Charles | 0 | 10 | 6 |
| Thompson, M. | 0 | 5 | 0 |
| Thompson, William | 0 | 5 | 0 |
| Thonger, G. | 0 | 2 | 6 |
| Tibbles, W. | 0 | 2 | 6 |
| Tomlinson, G. | 0 | 5 | 0 |
| Twivey, A. | 0 | 5 | 0 |
| Wakefield, T. | 0 | 5 | 0 |
| Whitehouse, J. | 0 | 5 | 0 |
| Wilcox, George | 0 | 5 | 0 |
| Wilkes, G. W. | 0 | 5 | 0 |
| Wilkes, J. S. | 0 | 2 | 6 |
| Wilton, W. E. | 0 | 2 | 6 |
| Woodcock, B. J. | 0 | 2 | 6 |

### Bishop Auckland.

| | | | |
|---|---|---|---|
| Dobinson, Thomas | 0 | 5 | 0 |
| Harburn, Alfred | 0 | 5 | 0 |
| Townend, Thomas F. | 0 | 5 | 0 |

### Bishop's Stortford.

| | | | |
|---|---|---|---|
| Hardy, John | 0 | 5 | 0 |
| Milbank, S. T. | 0 | 5 | 0 |
| Speechly, George | 0 | 10 | 6 |

### Blackburn.

| | | | |
|---|---|---|---|
| Ainsworth, B. | 0 | 2 | 6 |
| Aspinall, J. W. | 0 | 2 | 6 |
| Booth, J. | 0 | 10 | 6 |
| Butterfield, William | 0 | 5 | 0 |
| Clayton, Jowett and Ward | 0 | 10 | 6 |
| Critchley, T. | 0 | 5 | 0 |
| Farnworth, Walter | 0 | 10 | 6 |
| Garland, A. P. | 0 | 5 | 0 |
| Grimshaw, W. H. | 0 | 2 | 6 |
| Higson, J. | 0 | 5 | 0 |
| Hindle, H. | 0 | 5 | 0 |
| Hindle, James | 0 | 2 | 6 |
| Hindle, Joseph | 0 | 5 | 0 |
| Holden, J. | 0 | 2 | 6 |
| James, W. M. | 0 | 5 | 0 |
| Paffard, Frank | 0 | 5 | 0 |
| Pickup, W. | 0 | 5 | 0 |
| Wells, W. | 0 | 5 | 0 |

### Blackpool.

| | | | |
|---|---|---|---|
| Carter, Thomas | 0 | 10 | 6 |
| Jackson, Joseph | 0 | 5 | 0 |
| Laurie, John | 0 | 5 | 0 |
| Porter, T. | 0 | 5 | 0 |
| Richardson, W. C. | 0 | 5 | 0 |
| Sedgwick, J. | 0 | 5 | 0 |
| Taylor, W. C. | 0 | 2 | 6 |
| Turver, C. H. | 0 | 2 | 6 |

### Blaenau-Festiniog.

| | | | |
|---|---|---|---|
| Gratton, G. E. | 0 | 2 | 6 |

### Blandford.

| | | | |
|---|---|---|---|
| Groves, Richard H. | 1 | 1 | 0 |

### Blyth (Northamberland).

| | | | |
|---|---|---|---|
| Keith, J. | 0 | 2 | 6 |

### Bognor.

| | | | |
|---|---|---|---|
| Long, Alfred T. | 0 | 10 | 6 |

### Bolton.

| | | | |
|---|---|---|---|
| Blain, William | 0 | 10 | 6 |
| Blain, W. R. | 0 | 5 | 0 |
| Dearden, W. | 0 | 10 | 6 |
| Fawthorp, Joah | 0 | 5 | 0 |
| Forbes, James W. | 0 | 10 | 6 |
| Hart, James | 0 | 10 | 6 |
| Mather, James | 0 | 10 | 6 |
| Teebay, J. | 0 | 5 | 0 |

### Bombay (India).

| | | | |
|---|---|---|---|
| Davies, R. (Byculla) | 0 | 5 | 0 |
| Prebble, John G. | 0 | 5 | 0 |
| Stephenson, T. B. (Byculla) | 0 | 10 | 6 |

| **Bo'ness.** | £ | s. | d. |
|---|---|---|---|
| Tweedie, A. | 0 | 2 | 6 |
| **Bonnyrigg.** | | | |
| Hutcheon, W. | 0 | 5 | 0 |
| **Boscombe (Hants).** | | | |
| Endle, F. | 0 | 10 | 6 |
| Gordelier, F. H. | 0 | 10 | 6 |
| Haynes, J. A. | 0 | 5 | 0 |
| Noble, J. | 0 | 5 | 0 |
| Tame, T. | 0 | 5 | 0 |
| **Boston (Lincs.).** | | | |
| Bullivant, W. | 0 | 2 | 6 |
| Grimble, Albert | 0 | 5 | 0 |
| Haller, F. W. | 0 | 5 | 0 |
| Horry, W. T. | 0 | 2 | 6 |
| Kent, B. J. | 0 | 5 | 0 |
| **Boulogne-sur-Mer.** | | | |
| Parsons, J. Vincett | 0 | 5 | 0 |
| **Bourne (Lincs.).** | | | |
| Mills, Robert M. | 1 | 1 | 0 |
| **Bournemouth.** | | | |
| Amoore, H. | 0 | 5 | 0 |
| Bilson, F. E. | 1 | 1 | 0 |
| Bridge, G. E. | 1 | 1 | 0 |
| Faraday, G. (Pokesdown) | 0 | 2 | 6 |
| Hardwick, Stewart | 0 | 10 | 6 |
| Hobbs, A. E. | 0 | 5 | 0 |
| Jones, William | 1 | 1 | 0 |
| Rye, F. | 0 | 5 | 0 |
| Spinney, Frank | 0 | 10 | 6 |
| Taylor, George | 0 | 5 | 0 |
| Toone, J. A. | 0 | 10 | 6 |
| Trew, H. E. | 0 | 5 | 0 |
| Williams, J. H. | 0 | 5 | 0 |
| Worth, Edwin | 1 | 1 | 0 |
| Yates, S. P. | 0 | 5 | 0 |
| **Bourton-on-the-Water.** | | | |
| Miles, George | 0 | 2 | 6 |
| **Bowness-on-Windermere.** | | | |
| Birkett, Charles | 0 | 5 | 0 |
| **Bracknell.** | | | |
| Sandwith, W. H. | 0 | 5 | 0 |
| **Bradford (Lancs.).** | | | |
| Townsend, W. S. | 0 | 2 | 6 |
| **Bradford (Yorks.).** | | | |
| Blackburn, Bailey | 2 | 2 | 0 |
| Cocker, Justus J. | 0 | 5 | 0 |
| Collins, H. S. | 0 | 5 | 0 |
| Gott, A. T. | 0 | 5 | 0 |
| Harrison, Parkinson and Co. | 2 | 2 | 0 |
| Lister, Simeon (Great Horton) | 0 | 10 | 6 |
| Mitchell, J. A. | 0 | 2 | 6 |
| Rimmington and Son | 1 | 1 | 0 |
| Stephenson, Robert | 0 | 5 | 0 |
| Watts, John | 0 | 10 | 6 |
| Wilcock, F. A. | 0 | 2 | 6 |
| **Brading (I.W.).** | | | |
| Boan, J. E. J. | 0 | 5 | 0 |
| **Braintree.** | | | |
| Blade, Mrs. | 0 | 10 | 0 |
| Row, George C. | 0 | 5 | 0 |
| **Branscombe.** | | | |
| Cooper, George | 0 | 10 | 6 |
| **Braughing.** | | | |
| Franklyn, Thomas | 0 | 5 | 0 |
| **Brechin.** | | | |
| Hodgeton, D. | 0 | 5 | 0 |
| **Brecon.** | | | |
| Meredith, John | 0 | 10 | 6 |
| Morris, J. C. B. | 0 | 5 | 0 |
| Tudor, W. T. | 0 | 10 | 6 |
| **Brentford.** | | | |
| Wood, A. | 0 | 5 | 0 |
| **Bridgend.** | | | |
| Jenkins, D. | 0 | 5 | 0 |
| **Bridgnorth.** | | | |
| Cooper, H. S. | 0 | 2 | 6 |
| Hughes, Hubert | 0 | 5 | 0 |

| **Bridgwater.** | £ | s. | d. |
|---|---|---|---|
| Basker, J. A. | 0 | 5 | 0 |
| **Bridlington.** | | | |
| Gatenby, Robert | 0 | 5 | 0 |
| Wrack, F. G. | 0 | 2 | 6 |
| **Bridlington Quay.** | | | |
| Colley, H. W. | 0 | 2 | 6 |
| Jackson, Henry J. | 0 | 5 | 0 |
| **Bridport.** | | | |
| Beach and Barnicott | 1 | 1 | 0 |
| Beach, James | 0 | 10 | 6 |
| Beach, Thomas E. | 0 | 5 | 0 |
| **Brighton.** | | | |
| Arnold, J. | 0 | 5 | 0 |
| Ashton, C. S. | 0 | 10 | 6 |
| Barton, Charles | 0 | 10 | 6 |
| Barton, Henry | 0 | 10 | 6 |
| Bathe, R. S. | 0 | 10 | 6 |
| Blacklock, P. W. | 0 | 2 | 6 |
| Caton, E. C. | 0 | 10 | 6 |
| Chambers, Herbert | 0 | 5 | 6 |
| Colby, Mrs. G. | 1 | 1 | 0 |
| Costerton, H. | 0 | 10 | 6 |
| Cox, Arthur H. | 1 | 1 | 0 |
| Cupit, A. H. | 0 | 2 | 6 |
| Davies, C. | 0 | 5 | 0 |
| Edwards, J. | 1 | 1 | 0 |
| Else, William | 0 | 10 | 6 |
| Eyles, J. R. | 0 | 10 | 6 |
| Gibson, W. H. | 0 | 5 | 0 |
| Glaisyer, E. | 0 | 10 | 6 |
| Glaisyer, Thomas | 0 | 10 | 6 |
| Greening, B. C. | 0 | 5 | 0 |
| Guy, Frederick | 0 | 10 | 6 |
| Gwatkin, James Ross | 0 | 10 | 6 |
| Hardcastle, S. B. | 0 | 10 | 6 |
| Harris, E. R. | 0 | 5 | 0 |
| Hickley, G. | 0 | 10 | 6 |
| Histed, E. | 0 | 10 | 6 |
| Hornsby, George G. | 0 | 10 | 6 |
| Jeeves, Thomas | 0 | 10 | 6 |
| Leigh, Marshall | 2 | 2 | 0 |
| Levett, H. | 0 | 5 | 0 |
| Llewellyn, Peter H. | 0 | 5 | 0 |
| Marten, J. R. | 0 | 2 | 6 |
| Metherell, K. | 1 | 1 | 0 |
| Miller, J. | 0 | 10 | 6 |
| Mills, C. T. | 0 | 2 | 6 |
| Muston, G. G. | 0 | 5 | 0 |
| Nosworthy, A. P. | 0 | 5 | 0 |
| Nugent, G. T. | 0 | 2 | 6 |
| Padwick, John | 0 | 10 | 6 |
| Parris, T. W. | 0 | 5 | 0 |
| Pears, H. W. K. | 0 | 10 | 6 |
| Pears, Kilby | 0 | 10 | 6 |
| Perress, J. C. | 0 | 5 | 0 |
| Robson, Thomas | 0 | 10 | 6 |
| Salmon, E. F. | 0 | 10 | 6 |
| Savage and Son | 1 | 1 | 0 |
| Shelvey, — | 0 | 10 | 6 |
| Smith, Walter Henry | 1 | 1 | 0 |
| Smithson, J. | 0 | 10 | 6 |
| Stableforth, J. W. | 0 | 5 | 0 |
| Sussex Drug Company | 1 | 1 | 0 |
| Vizer, Edwin B. | 1 | 1 | 0 |
| Williamson, J. | 0 | 5 | 0 |
| Wyborn, E. | 0 | 10 | 6 |
| Yates, C. G. | 0 | 5 | 0 |
| **Brill (Bucks).** | | | |
| Tottenham and Holmes | 0 | 10 | 6 |
| **Bristol.** | | | |
| Allen, Benjamin | 0 | 10 | 6 |
| Barton, J. B. (Kingswood) | 0 | 5 | 0 |
| Bennett, Joseph | 0 | 5 | 0 |
| Berry, William | 0 | 10 | 6 |
| Boucher, C. E. | 0 | 5 | 0 |
| Boucher, John | 1 | 1 | 0 |
| Dibble, J. W. | 0 | 10 | 6 |
| Fardon, A. E. | 0 | 10 | 6 |
| Freestone, R. H. | 0 | 5 | 0 |
| Freestone, Thomas M. | 0 | 10 | 6 |
| Griffiths, H. T. | 0 | 5 | 0 |
| Hemmons, John | 0 | 5 | 0 |
| Hodder, H. | 0 | 5 | 0 |
| Howell, H. | 0 | 5 | 0 |
| Humpage, Miss | 1 | 1 | 0 |
| Isaac, G. W. | 0 | 10 | 6 |
| Jeffery, Henry | 0 | 10 | 6 |
| Keen, Benjamin | 0 | 10 | 6 |
| Kenderdine, A. G. | 0 | 5 | 0 |

| **Bristol—continued.** | £ | s. | d. |
|---|---|---|---|
| La Trobe, Henry | 0 | 5 | 0 |
| Llewellyn, David | 0 | 2 | 6 |
| Long, John T. | 0 | 10 | 6 |
| Maish, W. | 0 | 10 | 6 |
| Moore, J. E. | 0 | 5 | 0 |
| Newman, Robert | 0 | 5 | 0 |
| Pitchford, William | 0 | 10 | 6 |
| Pitman, John | 1 | 1 | 0 |
| Plumley, James G. | 0 | 5 | 0 |
| Presley, Edward | 0 | 5 | 0 |
| Schacht, G. F. | 1 | 1 | 0 |
| Sleight, F. | 0 | 2 | 6 |
| Spill, Thomas | 0 | 10 | 6 |
| Stroud, John | 1 | 1 | 0 |
| Towerzey, Alexander | 1 | 1 | 0 |
| Townsend, Charles | 1 | 1 | 0 |
| Townsend, Henry H. | 0 | 10 | 6 |
| Troake, R. J. | 0 | 10 | 6 |
| Tudor, W. | 0 | 2 | 6 |
| Turner, George T. | 0 | 10 | 6 |
| Wade, Thomas T. | 0 | 5 | 0 |
| Warren, Algernon | 1 | 1 | 0 |
| Watson, E. M. | 1 | 1 | 0 |
| Weeks, A. | 0 | 5 | 0 |
| White, James W. | 0 | 10 | 6 |
| Williams, J. H. | 0 | 10 | 6 |
| Williams, Rev. Moses | 0 | 5 | 0 |
| Young, E. F. | 0 | 2 | 6 |
| **Briton Ferry.** | | | |
| Olive, W. T. | 0 | 5 | 0 |
| **Bromley (Kent).** | | | |
| Allsworth, N. | 0 | 5 | 0 |
| Baxter, W. W. | 0 | 5 | 0 |
| Goulden, Herbert | 0 | 5 | 0 |
| Shillcock, G. | 0 | 5 | 0 |
| Skinner, Richard | 0 | 10 | 6 |
| **Bromyard.** | | | |
| Jones, Charles | 0 | 5 | 0 |
| **Brora.** | | | |
| Donaldson, W. | 0 | 5 | 0 |
| **Broughty Ferry.** | | | |
| Park, William | 0 | 5 | 0 |
| **Brynmawr.** | | | |
| Evans, Alfred E. | 0 | 5 | 0 |
| Jones, Alfred M. | 0 | 10 | 6 |
| **Buckingham.** | | | |
| Kingerlee, George | 1 | 1 | 0 |
| **Buckley.** | | | |
| Tomkins, W. K. | 0 | 5 | 0 |
| **Burgess Hill.** | | | |
| Beck, N. G. | 0 | 5 | 0 |
| Clarke, W. | 0 | 2 | 6 |
| **Burnham (Bucks).** | | | |
| Heald, Alfred J. | 0 | 10 | 6 |
| **Burnham Market.** | | | |
| Spencer, William Henry | 0 | 5 | 0 |
| **Burnham (Somerset).** | | | |
| Pumphrey, A. | 0 | 7 | 6 |
| **Burnley.** | | | |
| Barlow, Joseph A. | 0 | 2 | 6 |
| Cowgill, Brian H. | 0 | 10 | 0 |
| Evans, Thomas | 0 | 5 | 0 |
| Heaton, Martha | 0 | 5 | 0 |
| Hitchin, Robert | 0 | 5 | 0 |
| Parkinson, I. | 0 | 5 | 0 |
| Parkinson, William | 0 | 5 | 0 |
| Scott, J. | 0 | 10 | 6 |
| Tomlinson, N. | 0 | 2 | 6 |
| Walker, Sandford | 0 | 5 | 0 |
| Wright, John W. | 0 | 2 | 6 |
| **Burntisland.** | | | |
| Bisset, James | 0 | 2 | 6 |
| **Burry Port.** | | | |
| Thomas, T. Rees | 0 | | 0 |

### Burslem.

| | £ | s. | d. |
|---|---|---|---|
| Blackshaw, Thomas | 0 | 10 | 6 |
| Charles, T. | 0 | 10 | 0 |
| Hewitt, J. F. | 0 | 2 | 6 |
| Leicester, Thomas | 0 | 10 | 6 |
| Oldham, William | 0 | 10 | 6 |
| Parker, B. | 0 | 2 | 6 |
| Todd, C. | 0 | 2 | 6 |
| Wardle, Thomas | 0 | 2 | 6 |

### Burston Hall.

| | | | |
|---|---|---|---|
| Eldridge, J. H. | 0 | 10 | 0 |

### Burton-on-Trent.

| | | | |
|---|---|---|---|
| Ottey, Thomas | 0 | 5 | 0 |
| Wright, George | 0 | 10 | 6 |

### Bury.

| | | | |
|---|---|---|---|
| Crompton, H. | 0 | 10 | 6 |
| Hulme, T. | 0 | 5 | 0 |

### Bury St. Edmunds.

| | | | |
|---|---|---|---|
| Brain, F. S. | 0 | 5 | 0 |
| Clark, Owen A. | 0 | 5 | 0 |
| Crassweller, C. W. | 0 | 2 | 6 |
| Crassweller, W. E. | 0 | 5 | 0 |
| Floyd, I. | 0 | 5 | 0 |
| Hardwicke, J. E. | 0 | 5 | 0 |
| Kirkham, F. | 0 | 2 | 6 |
| Kirkham, Thomas | 0 | 2 | 6 |
| Nunn, E. W. | 1 | 1 | 0 |
| Nunn, W. J. and Son | 0 | 10 | 6 |
| Portway, John | 0 | 2 | 6 |
| Summers, Frank | 0 | 5 | 0 |
| Summers, Thos. D. | 0 | 5 | 0 |
| Thacker, C. B. | 0 | 5 | 0 |
| Youngman, Edward | 0 | 5 | 0 |
| Youngman, W. E. | 0 | 2 | 6 |

### Buxton (Derbyshire).

| | | | |
|---|---|---|---|
| Hobson, G. W. | 1 | 1 | 0 |
| Sutcliffe, I. | 0 | 5 | 0 |
| Wright, Robert | 0 | 5 | 0 |

### Calcutta.

| | | | |
|---|---|---|---|
| Dewar, D. | 0 | 8 | 6 |
| Mair, W. | 0 | 2 | 6 |

### Cambridge.

| | | | |
|---|---|---|---|
| Addison, C. S. | 0 | 10 | 6 |
| Beall, George | 0 | 5 | 0 |
| Beall, Samuel S. | 0 | 5 | 0 |
| Bryant, T. B. | 0 | 10 | 6 |
| Church, E. H. | 0 | 2 | 6 |
| Church, H. J. | 1 | 1 | 0 |
| Cook, H. F. | 0 | 5 | 0 |
| Deck, A. A. | 0 | 2 | 6 |
| Deck, Arthur | 0 | 10 | 0 |
| Field, E. | 0 | 5 | 0 |
| Flanders, H. | 0 | 5 | 0 |
| Greenwood, D. | 0 | 5 | 0 |
| Hutchin, L. A. J. | 0 | 5 | 0 |
| Ivatt, A. | 0 | 5 | 0 |
| Leech, C. R. | 0 | 2 | 6 |
| McAvoy, G. | 0 | 2 | 6 |
| Pain, Percy | 0 | 5 | 0 |
| Pain, Walter E. | 0 | 5 | 0 |
| Parson, H. J. | 0 | 5 | 0 |
| Peck, G. | 0 | 10 | 0 |
| Sturton, Richard | 1 | 1 | 0 |
| Wright, T. | 0 | 2 | 6 |
| Yeomans, John | 0 | 5 | 0 |

### Campbeltown.

| | | | |
|---|---|---|---|
| Cairnier, R. | 0 | 5 | 0 |

### Canterbury.

| | | | |
|---|---|---|---|
| Amos, Daniel | 0 | 10 | 6 |
| Biggleston, E. R. | 0 | 5 | 0 |
| Bing, Charles | 0 | 5 | 0 |
| Bing, Edwin | 0 | 10 | 6 |
| Fowler, W. H. | 0 | 10 | 6 |
| Harris, F. R. | 0 | 10 | 6 |
| Mount, Wm. | 0 | 5 | 0 |

### Cape Town.

| | | | |
|---|---|---|---|
| Jonas, Jas. | 1 | 1 | 0 |
| Ra ling, E. L. | 0 | 10 | 6 |
| Telb, Henry | 1 | 1 | 0 |

### Cardiff.

| | | | |
|---|---|---|---|
| Anthony, David | 0 | 10 | 6 |
| Benjamin, J. B. | 0 | 5 | 0 |
| Clark, C. | 0 | 5 | 0 |
| Coleman, Alfred | 0 | 10 | 6 |

### Cardiff—continued.

| | £ | s. | d. |
|---|---|---|---|
| Coleman, E. J. | 0 | 10 | 6 |
| Coleman, J. D. | 0 | 5 | 0 |
| Drane, Robert | 1 | 1 | 0 |
| Duck and Son | 0 | 5 | 0 |
| Duck, W. G. | 0 | 5 | 0 |
| Edwards, E. | 0 | 5 | 0 |
| Fargher, C. | 0 | 5 | 0 |
| Fargher, H. S. | 0 | 5 | 0 |
| Farthing, H. W. | 0 | 5 | 0 |
| Foster, J. E. | 0 | 2 | 6 |
| Furnival, William | 0 | 5 | 0 |
| Gower, J. | 0 | 2 | 6 |
| Greaves, John | 0 | 5 | 0 |
| Hagon, Albert | 0 | 5 | 0 |
| Harries, D. | 0 | 5 | 0 |
| Hicks, W. T. | 0 | 5 | 0 |
| Hopkins, W. R. | 0 | 2 | 6 |
| Howell, Thomas | 0 | 5 | 0 |
| Hughes, J. | 0 | 5 | 0 |
| Izdebski, S. T. E. P. | 0 | 2 | 6 |
| Jones, J. A. | 0 | 5 | 0 |
| Jones, John T. | 0 | 5 | 0 |
| Kernick and Son | 0 | 10 | 6 |
| Lewis, D. J. | 0 | 5 | 0 |
| Lewis, James | 0 | 5 | 0 |
| Lloyd, David | 0 | 5 | 0 |
| Milward, F. | 0 | 5 | 0 |
| Mumford, Richard | 0 | 5 | 0 |
| Munday, John | 0 | 10 | 6 |
| Pearson, H. | 1 | 1 | 0 |
| Prust, Richard | 0 | 5 | 0 |
| Rees, John | 0 | 5 | 0 |
| Sanders, W. J. | 0 | 5 | 0 |
| Thomas, D. | 0 | 5 | 0 |
| Treharne, F. G. | 0 | 5 | 0 |
| Wakeford, T. | 0 | 2 | 6 |
| Walklate and Co. | 0 | 5 | 0 |
| Williams, R. E. | 0 | 5 | 0 |
| Williams, Thomas | 0 | 10 | 6 |
| Williams, W. Jesse | 0 | 5 | 0 |
| Yorath, T. V. | 0 | 5 | 0 |

### Carlisle.

| | | | |
|---|---|---|---|
| Dalziel, C. M. | 0 | 10 | 6 |
| Fisher, Catherine Hodgson | 0 | 5 | 0 |
| Foster, James | 0 | 5 | 0 |
| Halhead, J. A. | 0 | 2 | 6 |
| Hallaway, John | 0 | 5 | 0 |
| Nichol, A. | 1 | 1 | 0 |
| Parker, Edward J. | 0 | 5 | 0 |
| Pattinson, M. H. | 0 | 5 | 0 |
| Reay, J. | 0 | 2 | 6 |
| Ridley, T. | 0 | 5 | 0 |
| Robson, John | 0 | 5 | 0 |
| Simpson, P. | 0 | 5 | 0 |
| Thompson, Andrew | 0 | 10 | 6 |

### Carluke.

| | | | |
|---|---|---|---|
| Hinksman, John | 0 | 10 | 0 |

### Carmarthen.

| | | | |
|---|---|---|---|
| Davies, C. E. | 0 | 5 | 0 |
| James, J. | 0 | 5 | 0 |
| Lloyd, Walter | 0 | 5 | 0 |

### Carnarvon.

| | | | |
|---|---|---|---|
| Francis, James | 0 | 2 | 6 |
| Jones, John | 0 | 5 | 0 |
| Lloyd, William | 0 | 5 | 0 |
| Owen, G. C. R. | 0 | 5 | 0 |

### Carshalton.

| | | | |
|---|---|---|---|
| Carter, Francis | 0 | 10 | 6 |

### Castle Cary.

| | | | |
|---|---|---|---|
| Moore, Francis S. | 0 | 10 | 0 |

### Castle Douglas.

| | | | |
|---|---|---|---|
| Veitch, A. | 0 | 5 | 0 |

### Castle Hedingham.

| | | | |
|---|---|---|---|
| Webb, W. J. | 0 | 5 | 0 |

### Catford.

| | | | |
|---|---|---|---|
| Bishop, W. M. | 0 | 2 | 6 |

### Caton (Lancs).

| | | | |
|---|---|---|---|
| Preston, W. L. | 0 | 5 | 0 |

### Caversham.

| | | | |
|---|---|---|---|
| Mountain, J. T. | 0 | 2 | 6 |

### Chard.

| | | | |
|---|---|---|---|
| Churchouse, C. H. | 0 | 5 | 0 |

### Charlestown-of-Aberlour.

| | | | |
|---|---|---|---|
| Smith, John | 0 | 2 | 6 |

### Chatham.

| | £ | s. | d. |
|---|---|---|---|
| Lamb, Thomas C. | 0 | 5 | 0 |
| Morgan, Alfred W. | 0 | 5 | 0 |

### Chatteris.

| | | | |
|---|---|---|---|
| Whitlamsmith, W. | 0 | 5 | 0 |

### Chelmsford.

| | | | |
|---|---|---|---|
| Dymond, T. S. | 0 | 5 | 0 |
| Metcalfe, Wilson | 0 | 10 | 6 |
| Tomlinson, James | 0 | 10 | 6 |
| Warren, F. | 0 | 10 | 6 |
| Wright, W. | 0 | 10 | 6 |

### Cheltenham.

| | | | |
|---|---|---|---|
| Balcomb, John | 1 | 1 | 0 |
| Barron, William | 0 | 10 | 6 |
| Beetham and Son | 1 | 1 | 0 |
| Blaylock, R. | 0 | 2 | 6 |
| Butcher, Thomas | 1 | 1 | 0 |
| Codling, A. J. | 0 | 10 | 6 |
| Cox, W. F. | 0 | 2 | 6 |
| Dalton, R. | 0 | 2 | 6 |
| Davies, H. | 0 | 2 | 6 |
| Dolman, Mrs. | 0 | 5 | 0 |
| Fletcher and Palmer | 1 | 1 | 0 |
| Fletcher, John | 1 | 1 | 0 |
| Forth, W. | 1 | 1 | 0 |
| Hands, William | 0 | 5 | 0 |
| Hill, Arthur | 0 | 5 | 0 |
| Hill, W. H. | 0 | 5 | 0 |
| Hillman, — | 0 | 2 | 6 |
| James, J. | 0 | 2 | 6 |
| Jeffrey, Thomas A. | 0 | 10 | 6 |
| Mowatt, J. R. | 0 | 5 | 0 |
| Organ, E. | 0 | 5 | 0 |
| Palmer, F. T. | 0 | 10 | 6 |
| Pattison, Thomas | 1 | 1 | 0 |
| Power, J. H. | 0 | 5 | 0 |
| Purnell, Mrs. | 0 | 5 | 0 |
| Saxby, A. C. | 0 | 5 | 0 |
| Smith, Nathaniel and Co. | 1 | 1 | 0 |
| Stewart, James | 1 | 1 | 0 |
| Thomas, J. A. and J. P. | 0 | 10 | 6 |
| Whitney, — | 0 | 2 | 6 |
| Wilkins, H. | 0 | 5 | 0 |
| Willis, C. J. | 0 | 5 | 0 |

### Chepstow.

| | | | |
|---|---|---|---|
| Clarke, C. H. | 0 | 5 | 0 |

### Chertsey.

| | | | |
|---|---|---|---|
| Boyce, George | 0 | 5 | 0 |
| Gerrard, A. W. | 1 | 1 | 0 |

### Chester.

| | | | |
|---|---|---|---|
| Baker, W. H. | 0 | 5 | 0 |
| Baxter, George | 0 | 10 | 6 |
| Bowers, James D. | 0 | 5 | 0 |
| Cheers, S. | 0 | 5 | 0 |
| Davidson, W. | 0 | 5 | 0 |
| Dickenson, D. | 0 | 5 | 0 |
| Donald, A. | 0 | 2 | 6 |
| Guy, J. | 0 | 5 | 0 |
| Hodges, W. | 0 | 5 | 0 |
| Hopley, J. H. | 0 | 5 | 0 |
| Huke, James W. | 0 | 5 | 0 |
| Kemp, G. | 0 | 10 | 0 |
| Mills, John | 0 | 5 | 0 |
| Roberts, R. M. (Executors of) | 0 | 5 | 0 |
| Roberts, W. | 0 | 5 | 0 |
| Shrubsole, A. | 0 | 2 | 6 |
| Spencer, J. H. | 0 | 5 | 0 |
| Thomas, J. H. | 0 | 2 | 6 |
| Turver, W. | 0 | 5 | 0 |
| Young, W. J. | 0 | 10 | 6 |

### Chesterfield.

| | | | |
|---|---|---|---|
| Barfoot, J. R. D. | 0 | 5 | 0 |
| Booth, George | 0 | 10 | 6 |
| Elliott, Thomas (Newbold) | 0 | 5 | 0 |
| Furness, Thomas | 0 | 10 | 6 |
| Greaves, A. W. | 0 | 5 | 0 |
| Knighton, T. W. | 0 | 5 | 0 |
| Lancaster, Wm. G. | 0 | 5 | 0 |
| Sampson, George | 0 | 5 | 0 |
| Toplis, J. H. | 0 | 2 | 6 |
| Windle, John T. | 0 | 5 | 0 |
| Wright, G. | 0 | 5 | 0 |

### Chester-le-Street.

| | | | |
|---|---|---|---|
| Greenwell, Richard Henry | 0 | 5 | 0 |

### Chicago (U.S.A.).

| | | | |
|---|---|---|---|
| Grammer, F. | 0 | 5 | 7 |

### Chichester.

| | £ | s. | d. |
|---|---|---|---|
| Raker and Son | 0 | 10 | 6 |
| Thorp, E. | 0 | 2 | 6 |

### Chippenham.

| | £ | s. | d. |
|---|---|---|---|
| Coles, John C. | 0 | 10 | 6 |
| Turpin, A. B. | 0 | 5 | 0 |

### Chipping Ongar.

| | £ | s. | d. |
|---|---|---|---|
| Ward, David | 0 | 10 | 6 |

### Chipping Sodbury.

| | £ | s. | d. |
|---|---|---|---|
| Jones, Richard | 0 | 10 | 6 |

### Chislehurst.

| | £ | s. | d. |
|---|---|---|---|
| Herbert, H. W. | 0 | 5 | 0 |
| Reynolds, A. B, | 0 | 5 | 0 |

### Chorley.

| | £ | s. | d. |
|---|---|---|---|
| Hill, William | 0 | 5 | 0 |
| Oakes, G. | 0 | 5 | 0 |

### Christchurch.

| | £ | s. | d. |
|---|---|---|---|
| Green, H. S. | 0 | 2 | 6 |
| Green, J. | 0 | 2 | 6 |

### Chulmleigh.

| | £ | s. | d. |
|---|---|---|---|
| Joint, Robert James | 0 | 6 | 0 |

### Cirencester.

| | £ | s. | d. |
|---|---|---|---|
| Griffiths, Waldron | 0 | 10 | 6 |
| Kinch, Professar | 0 | 10 | 6 |
| Paternoster, J. | 0 | 5 | 0 |

### Clacton-on-Sea.

| | £ | s. | d. |
|---|---|---|---|
| Mackenzie, Mrs. | 0 | 2 | 6 |
| Mann, William | 0 | 5 | 0 |
| Page, Miss M. | 0 | 2 | 6 |
| Piggott, Mary | 1 | 1 | 0 |
| Sherlock, Mrs. | 0 | 2 | 6 |
| Trounson, J. | 0 | 10 | 6 |

### Clare (Suffolk).

| | £ | s. | d. |
|---|---|---|---|
| Love, J. G. | 0 | 1 | 0 |
| Stokoe, T. | 0 | 2 | 6 |

### Claycross.

| | £ | s. | d. |
|---|---|---|---|
| Lloyd, Robert | 0 | 10 | 6 |
| Smith, John | 0 | 5 | 0 |

### Clun.

| | £ | s. | d. |
|---|---|---|---|
| Darroll, William | 1 | 1 | 0 |

### Coalville.

| | £ | s. | d. |
|---|---|---|---|
| Brunt, F. | 0 | 5 | 0 |

### Cockermouth.

| | £ | s. | d. |
|---|---|---|---|
| Bowerbank, Joseph | 1 | 1 | 0 |
| Brown, R. F. | 0 | 2 | 6 |
| Robinson, William | 0 | 5 | 0 |

### Codnor (near Derby).

| | £ | s. | d. |
|---|---|---|---|
| Farnsworth, Thomas | 0 | 5 | 0 |

### Colchester.

| | £ | s. | d. |
|---|---|---|---|
| Baker, H. L. | 0 | 5 | 0 |
| Barritt and Son | 0 | 10 | 6 |
| Bates, Thomas W. | 0 | 5 | 0 |
| Cordley, W. B. | 0 | 5 | 0 |
| Davies, Rees | 0 | 5 | 0 |
| Everitt, W. E. | 0 | 5 | 0 |
| Jopling, W. | 0 | 5 | 0 |
| Prosser, Mrs. | 0 | 5 | 0 |
| Shenstone, J. C. | 0 | 5 | 0 |
| Smith, W. | 0 | 5 | 0 |
| Weddell, Arthur | 0 | 5 | 0 |

### Coldstream.

| | £ | s. | d. |
|---|---|---|---|
| Elliot, W. M. | 0 | 5 | 0 |

### Collumpton.

| | £ | s. | d. |
|---|---|---|---|
| Foster, J. | 0 | 10 | 6 |
| Foster, M. T. | 0 | 2 | 6 |

### Colwyn.

| | £ | s. | d. |
|---|---|---|---|
| Hannah, C. | 0 | 5 | 0 |
| Sykes, F. J. | 0 | 5 | 0 |

### Colyton.

| | £ | s. | d. |
|---|---|---|---|
| Skinner, A. J. P. | 0 | 5 | 0 |

### Combe Martin.

| | £ | s. | d. |
|---|---|---|---|
| Shapcott, W. H. P. | 0 | 5 | 0 |

### Coningsby.

| | £ | s. | d. |
|---|---|---|---|
| Brown, Leonard H. | 0 | 10 | 6 |

### Consett.

| | £ | s. | d. |
|---|---|---|---|
| Milner, T. | 0 | 3 | 0 |

### Constantinople.

| | £ | s. | d. |
|---|---|---|---|
| Bateman, J. M. | 1 | 1 | 0 |

### Cork.

| | £ | s. | d. |
|---|---|---|---|
| Walker, W. | 0 | 2 | 6 |

### Corwen.

| | £ | s. | d. |
|---|---|---|---|
| Jones, William | 0 | 10 | 6 |

### Cosham.

| | £ | s. | d. |
|---|---|---|---|
| Baker, T. B. | 0 | 5 | 0 |

### Coventry.

| | £ | s. | d. |
|---|---|---|---|
| Axford, J. W. | 0 | 10 | 6 |
| Bampton, G. F. | 0 | 2 | 6 |
| Bird, Frederick | 0 | 2 | 6 |
| Brown, John | 0 | 5 | 0 |
| Clarke, William | 0 | 2 | 6 |
| Glover, Henry | 0 | 2 | 6 |
| Hinds, James | 0 | 10 | 6 |
| Jelly, George William | 0 | 5 | 0 |
| Lengden, D. M. | 0 | 2 | 6 |
| Mason, D. | 0 | 2 | 6 |
| Newton, Alfred H. | 0 | 2 | 6 |
| Sellors, Thomas | 0 | 2 | 6 |
| Wyleys and Co. | 1 | 1 | 0 |

### Cowbridge.

| | £ | s. | d. |
|---|---|---|---|
| Thomas, John | 0 | 5 | 0 |

### Cowes (Isle of Wight).

| | £ | s. | d. |
|---|---|---|---|
| Beaven, George A. | 0 | 10 | 0 |

### Cranbrook.

| | £ | s. | d. |
|---|---|---|---|
| Turner, John | 0 | 5 | 0 |

### Crawley.

| | £ | s. | d. |
|---|---|---|---|
| Leach, John | 0 | 5 | 0 |

### Crediton.

| | £ | s. | d. |
|---|---|---|---|
| Jackson and Sons | 1 | 1 | 0 |

### Crewe.

| | £ | s. | d. |
|---|---|---|---|
| Booth, E. | 0 | 5 | 0 |
| Mason, E. | 0 | 5 | 0 |

### Crewkerne.

| | £ | s. | d. |
|---|---|---|---|
| Catford, O. W. | 0 | 5 | 0 |
| Rubbra, F. E. | 0 | 2 | 6 |

### Criccieth.

| | £ | s. | d. |
|---|---|---|---|
| Bowen, Joseph W. | 0 | 2 | 6 |

### Cromer.

| | £ | s. | d. |
|---|---|---|---|
| Davison, D. | 0 | 5 | 0 |
| Dulley, D. | 0 | 5 | 0 |
| Hoare, W. P. | 0 | 5 | 0 |
| Horner, R. | 0 | 2 | 6 |

### Cromford (Derbyshire).

| | £ | s. | d. |
|---|---|---|---|
| Nicklinson, T. | 0 | 5 | 0 |

### Croydon.

| | £ | s. | d. |
|---|---|---|---|
| Barritt, George | 0 | 10 | 6 |
| Batty, G. A. | 0 | 2 | 6 |
| Chapman, J. | 0 | 5 | 0 |
| Clarke, Josiah | 1 | 1 | 0 |
| Culverwell, John S. | 0 | 5 | 0 |
| Dixon, W. R. | 0 | 5 | 0 |
| Green, J. W. | 0 | 5 | 0 |
| Grimwade, E. H. | 0 | 10 | 6 |
| Harrison, E. F. | 0 | 5 | 0 |
| Hart, A. | 0 | 5 | 0 |
| Long, Henry | 0 | 10 | 6 |
| Neal, W. | 0 | 5 | 0 |
| Nichols, A. F. | 0 | 5 | 0 |
| Perkin, R. J. | 0 | 5 | 0 |
| Phillips, W. C. | 0 | 5 | 0 |
| Roberts, D. P. | 0 | 10 | 6 |
| Sanders, F. T. | 0 | 5 | 0 |
| Sergent, W. T. | 0 | 2 | 6 |
| Vinden, F. W. | 0 | 2 | 6 |

### Cuckfield (Sussex).

| | £ | s. | d. |
|---|---|---|---|
| White, W. E. | 0 | 5 | 0 |

### Cullen (N.B.).

| | £ | s. | d. |
|---|---|---|---|
| Buchanan, John | 0 | 2 | 6 |
| Seivwright, George | 0 | 10 | 6 |

### Cumnock.

| | £ | s. | d. |
|---|---|---|---|
| Kay, W. | 0 | 5 | 0 |

### Darlaston.

| | £ | s. | d. |
|---|---|---|---|
| Smith, F. A. | 0 | 10 | 6 |

### Darlington.

| | £ | s. | d. |
|---|---|---|---|
| Best, G. | 0 | 2 | 6 |
| Clare, John | 0 | 10 | 6 |
| Nicholson, Richard | 0 | 5 | 0 |
| Pullin, W. H | 0 | 10 | 6 |
| Raw, James H. | 0 | 5 | 0 |
| Robinson, James | 0 | 5 | 0 |

### Dartford.

| | £ | s. | d. |
|---|---|---|---|
| Beale, F. O. | 0 | 2 | 6 |
| Cann, James | 0 | 5 | 0 |
| Goff, W. E. | 1 | 1 | 0 |
| Horrell, A. E. | 0 | 5 | 0 |
| Williams, W. L. | 0 | 10 | 6 |

### Dartmouth.

| | £ | s. | d. |
|---|---|---|---|
| Hadfield, H. M. | 0 | 5 | 0 |
| Humphry, H. | 0 | 5 | 0 |
| Rees, Colin A. | 0 | 5 | 0 |
| Rees, William H. | 0 | 10 | 0 |

### Darwen.

| | £ | s. | d. |
|---|---|---|---|
| Lomax, W. H. | 0 | 5 | 0 |
| Shorrock, R. | 0 | 5 | 0 |

### Datchet.

| | £ | s. | d. |
|---|---|---|---|
| Willcocks, A. S. | 0 | 5 | 0 |

### Deal.

| | £ | s. | d. |
|---|---|---|---|
| Dunn, George S. | 0 | 5 | 0 |
| Fitt, F. E. | 0 | 5 | 0 |
| Green, John | 0 | 10 | 6 |
| Johns, T. | 0 | 5 | 0 |

### Denton (Lancs.).

| | £ | s. | d. |
|---|---|---|---|
| Arrandale, William | 0 | 10 | 6 |

### Derby.

| | £ | s. | d. |
|---|---|---|---|
| Ashley, William | 0 | 5 | 0 |
| Blunt, Walter B. | 0 | 2 | 6 |
| Booth, C. W. | 0 | 2 | 6 |
| Clifton, Frederick | 0 | 5 | 0 |
| Cope, J. A. | 0 | 10 | 6 |
| Frost, George | 0 | 10 | 6 |
| Hart, C. D. | 0 | 5 | 0 |
| Hefford, Charles | 0 | 2 | 6 |
| Hoare, C. F. | 0 | 2 | 6 |
| Hughes, John S. | 0 | 2 | 6 |
| Machon, Edward | 0 | 5 | 0 |
| Monkhouse, Henry | 0 | 5 | 0 |
| Ordish, Thomas | 0 | 2 | 6 |
| Scholes, J. S. | 0 | 5 | 0 |
| Sherwin, Samuel | 0 | 2 | 6 |
| Stevenson, Richard W. | 0 | 5 | 0 |
| Ward, J. | 0 | 5 | 0 |

### Devizes.

| | £ | s. | d. |
|---|---|---|---|
| Cripps, E. H. | 0 | 2 | 6 |
| Edwards, T. R. | 0 | 2 | 6 |

### Devonport.

| | £ | s. | d. |
|---|---|---|---|
| Breeze, A. D. | 0 | 5 | 0 |
| Breeze, George | 0 | 5 | 0 |
| Codd, Francis | 0 | 5 | 0 |
| Davey, H. D. | 0 | 2 | 6 |
| Johnson, M. K. | 0 | 5 | 0 |
| Kelly, P. A. | 0 | 5 | 0 |
| Lamble, John A. | 0 | 2 | 6 |
| Rendle, R. H. | 0 | 5 | 0 |
| Ryall, F. J. | 0 | 5 | 0 |

### Didsbury.

| | £ | s. | d. |
|---|---|---|---|
| Bates, John F. | 0 | 5 | 0 |

### Diss.

| | £ | s. | d. |
|---|---|---|---|
| Cupiss, Mrs. E. | 0 | 10 | 6 |
| Gostling, T. P. | 0 | 10 | 6 |
| Whitrod, H. F. | 0 | 5 | 0 |

### Doncaster.

| | £ | s. | d. |
|---|---|---|---|
| Bonnett, F. | 0 | 2 | 6 |
| Brooke, T. N. | 0 | 2 | 6 |
| Connor, Thomas H. | 0 | 10 | 6 |
| Hasselby, T. J. | 0 | 2 | 6 |
| Howorth, James | 0 | 10 | 6 |
| Jaques, George | 0 | 10 | 6 |
| Parkin, Charles | 0 | 5 | 0 |
| Stiles, M. H. | 0 | 10 | 6 |
| Wyatt, S. | 0 | 2 | 6 |

### Dorchester.

| | £ | s. | d. |
|---|---|---|---|
| Pearce, William L. | 0 | 5 | 0 |

### Dorking.

| | £ | s. | d. |
|---|---|---|---|
| Doubleday, F. W. | 0 | 10 | 6 |
| Emsley, J. | 0 | 10 | 6 |
| Evans, E. M. | 0 | 5 | 0 |

### Douglas (Isle of Man).

| | | | |
|---|---|---|---|
| Brearey, A. W. | 1 | 1 | 0 |
| Clugstone, W. | 0 | 5 | 0 |
| Frowde, J. J | 0 | 5 | 0 |
| Gore, J. R. A. | 0 | 5 | 0 |
| Greensill and Son | 1 | 1 | 0 |
| Maley, G. J. | 0 | 2 | 6 |
| Qualtrough, T. S. | 0 | 2 | 6 |
| Radcliffe, J. C. | 0 | 5 | 0 |
| Young, John | 0 | 5 | 0 |

### Dover.

| | | | |
|---|---|---|---|
| Atkins, J. | 0 | 5 | 0 |
| Barnes, William James | 0 | 5 | 0 |
| Bottle, Alexander | 1 | 1 | 0 |
| Brown, Joseph Fred. | 1 | 1 | 0 |
| Dickeson, Sir Richard | 1 | 1 | 0 |
| Ewell, Richard M. | 0 | 5 | 0 |
| Forster, G. F. | 0 | 5 | 0 |
| Forster, Robert Henry | 0 | 10 | 6 |
| Hambrook, E. O. | 0 | 5 | 0 |
| Hambrook, John Barber | 0 | 5 | 0 |
| Leigh, H. M. | 0 | 2 | 6 |
| Long, F. J. T. | 0 | 5 | 0 |
| Long, S. G. H. | 0 | 5 | 0 |
| Peake, Henry | 1 | 1 | 0 |
| Stevens, E. M. | 0 | 10 | 0 |
| Thompson, A. L. | 0 | 10 | 6 |
| Thompson, Edward | 0 | 10 | 6 |

### Downton.

| | | | |
|---|---|---|---|
| Dunmore, G. H. | 0 | 10 | 6 |

### Driffield.

| | | | |
|---|---|---|---|
| Bordass, James | 0 | 5 | 0 |
| Parkinson, Thomas | 0 | 5 | 0 |

### Droitwich.

| | | | |
|---|---|---|---|
| Harris, S. | 0 | 5 | 0 |

### Dublin.

| | | | |
|---|---|---|---|
| Bowles, Charles A. | 0 | 10 | 6 |
| Webb, J. | 0 | 5 | 0 |

### Dufftown (N.B.).

| | | | |
|---|---|---|---|
| MacPherson, W. | 0 | 5 | 0 |

### Dumbarton.

| | | | |
|---|---|---|---|
| Babtie, John | 0 | 5 | 0 |

### Dumfries.

| | | | |
|---|---|---|---|
| Allan, William | 0 | 5 | 0 |
| Johnstone, T. F. | 0 | 2 | 6 |
| McDonald, J. | 0 | 5 | 0 |
| Sutherland, J. W. | 0 | 5 | 0 |
| Turner, A. | 0 | 5 | 0 |

### Dunbar.

| | | | |
|---|---|---|---|
| Wilson, W. | 0 | 5 | 0 |

### Dundee.

| | | | |
|---|---|---|---|
| Hardie, James | 0 | 10 | 6 |
| Hardie, James M. | 0 | 10 | 6 |
| Kerr, C. | 0 | 5 | 0 |
| McMillan, James | 0 | 10 | 6 |

### Dunfermline.

| | | | |
|---|---|---|---|
| Fisher, J. H. | 0 | 5 | 0 |
| Gilmour, David | 0 | 5 | 0 |
| Seath, Alexander | 0 | 10 | 6 |
| Tocher, J. | 0 | 5 | 0 |

### Dunkeld.

| | | | |
|---|---|---|---|
| McDonald, Kenneth | 0 | 10 | 6 |

### Dunstable.

| | | | |
|---|---|---|---|
| Flemons, J. | 0 | 5 | 0 |
| Herington, J. H. | 0 | 5 | 0 |

### Durham.

| | | | |
|---|---|---|---|
| Palmer, C. N. | 0 | 2 | 6 |
| Ramsbottom, F. C. | 0 | 2 | 6 |
| Rollin, John G. | 0 | 5 | 0 |
| Sarsfield, John | 0 | 2 | 6 |
| Sarsfield, William | 0 | 10 | 6 |
| Scawin and Burn | 0 | 10 | 0 |
| Wise, Joseph N. | 0 | 5 | 0 |

### Dursley.

| | | | |
|---|---|---|---|
| Perodeau, E. G. (Uley) | 0 | 5 | 0 |

### Ealing.

| | £ | s. | d. |
|---|---|---|---|
| Curtis, Fred. G. | 0 | 10 | 6 |
| Hayles, J. | 0 | 10 | 6 |
| Holmes, C. J. | 0 | 10 | 6 |
| Lilley, T. | 1 | 11 | 6 |
| Phillips, J. E. | 0 | 10 | 6 |
| Sanquinetti, F. | 0 | 10 | 6 |
| Thomas, Richard | 0 | 10 | 6 |

### Earlstown.

| | | | |
|---|---|---|---|
| Peake, Arthur | 0 | 5 | 0 |

### Eastbourne.

| | | | |
|---|---|---|---|
| Andrews, H. T. | 0 | 10 | 6 |
| Andrews, J. F. | 0 | 10 | 6 |
| Anstey, J. U. | 0 | 5 | 0 |
| Browne, Henry R. | 1 | 1 | 0 |
| Crook, Herbert | 1 | 1 | 0 |
| Earnshaw, B. K. | 0 | 10 | 6 |
| Gibbs and Son | 1 | 1 | 0 |
| Hall, Samuel | 1 | 1 | 0 |
| Harmer, G. A. | 0 | 5 | 0 |
| Price, W. | 0 | 5 | 0 |
| Routly, J. | 0 | 5 | 0 |
| Senior, J. | 0 | 5 | 0 |
| Trickey, R. H. | 0 | 10 | 6 |
| Willan, — | 0 | 5 | 0 |
| Willett, Dr. T. | 1 | 1 | 0 |

### East Dereham.

| | | | |
|---|---|---|---|
| Peck, Edward | 0 | 10 | 6 |

### East Linton, N.B.

| | | | |
|---|---|---|---|
| Whitelaw, A. | 0 | 2 | 6 |

### East Molesey.

| | | | |
|---|---|---|---|
| Kent, W. H. P. | 0 | 5 | 0 |

### Eastleigh (Hants).

| | | | |
|---|---|---|---|
| Van, F. W. S. | 0 | 5 | 0 |

### Eastwood (Notts).

| | | | |
|---|---|---|---|
| Skelton, J. H. | 0 | 5 | 0 |

### Eccles.

| | | | |
|---|---|---|---|
| Blackburn, A. E. H. | 0 | 5 | 0 |
| Bomford, A. C. | 0 | 5 | 0 |
| Bowden, W. (Patricroft) | 1 | 1 | 0 |
| Howie, W. L. | 1 | 1 | 0 |
| Oldfield, F. | 0 | 5 | 0 |
| R. T. H. | 0 | 10 | 6 |
| Scholes, W. I. | 0 | 5 | 0 |
| Taylor, J. | 0 | 5 | 0 |

### Eccleshall.

| | | | |
|---|---|---|---|
| Goodman, F. W. | 0 | 10 | 6 |

### Edenbridge.

| | | | |
|---|---|---|---|
| Arnold, J. | 0 | 10 | 6 |

### Edgerton.

| | | | |
|---|---|---|---|
| Wheatley, J. | 0 | 10 | 0 |

### Edgware.

| | | | |
|---|---|---|---|
| Williams, H. | 0 | 5 | 0 |

### Edinburgh.

| | | | |
|---|---|---|---|
| Aitken, James | 0 | 5 | 0 |
| Arthur, Charles | 0 | 5 | 0 |
| Baildon, H. C. and Son | 1 | 1 | 0 |
| Baker, W. C. | 0 | 5 | 0 |
| Blenkiron, J. | 0 | 2 | 6 |
| Boa, Peter | 0 | 5 | 0 |
| Bruce, A. G. | 0 | 5 | 0 |
| Buchanan, James | 1 | 1 | 0 |
| Burley, William | 0 | 5 | 0 |
| Center, J. A. | 0 | 5 | 0 |
| Clark, Andrew | 0 | 5 | 0 |
| Clark, Dr. William Inglis | 0 | 10 | 6 |
| Dawson, A. F. | 0 | 2 | 6 |
| Dewar, F. L. | 0 | 5 | 0 |
| Dick, Robert | 1 | 1 | 0 |
| Dott, David B. | 0 | 10 | 0 |
| Duncan, A. | 0 | 5 | 0 |
| Duncan, William | 0 | 5 | 0 |
| (Edinburgh Meeting) British Pharmaceutical Conference | 5 | 5 | 0 |
| Ewing, James L. | 1 | 1 | 0 |
| Findlay, J. | 0 | 2 | 6 |
| Fleming, J. | 0 | 2 | 6 |
| Forret, John A. | 0 | 5 | 0 |
| Fraser, Alexander | 0 | 5 | 0 |
| Fraser, J. I. | 0 | 5 | 0 |
| Gamley, David | 0 | 5 | 0 |

### Edinburgh—continued.

| | £ | s. | d. |
|---|---|---|---|
| Gibson, Adam | 0 | 10 | 6 |
| Hendry, R. L. | 0 | 5 | 0 |
| Henry C. F. | 0 | 5 | 0 |
| Heron, James | 1 | 1 | 0 |
| Hill, John R. | 0 | 5 | 0 |
| Keith, Sydney | 0 | 5 | 0 |
| Laird, G. H. | 0 | 5 | 0 |
| Laurie, J. M. | 0 | 5 | 0 |
| Lockerbie, James | 0 | 5 | 0 |
| Lunan, G. | 0 | 5 | 0 |
| Lyall, J. | 0 | 2 | 6 |
| Lyon, W. | 0 | 5 | 0 |
| MacCallum, A. J. | 0 | 5 | 0 |
| MacDonald, D. F. | 0 | 2 | 6 |
| Macdonald, John | 0 | 5 | 0 |
| Macfarlan and Co. | 2 | 2 | 0 |
| McGlashan, J. | 0 | 5 | 0 |
| MacLaren, David | 0 | 10 | 0 |
| McPherson, Colin A. | 0 | 5 | 0 |
| Middleton, D. | 0 | 5 | 0 |
| Morison, John | 0 | 5 | 0 |
| Noble, Alexander | 1 | 1 | 0 |
| Pinkerton, William | 0 | 10 | 6 |
| Prentice, J. | 0 | 5 | 0 |
| Purves, Samuel | 0 | 5 | 0 |
| Raimes, Clark and Co. | 2 | 2 | 0 |
| Ritchie, J. | 0 | 5 | 0 |
| Robertson, G. | 0 | 5 | 0 |
| Robertson, James and Co. | 1 | 1 | 0 |
| Robertson, John | 0 | 5 | 0 |
| Scobie, James | 0 | 5 | 0 |
| Scott, James | 0 | 10 | 6 |
| Sime, T. | 0 | 2 | 6 |
| Small, J. A. | 0 | 5 | 0 |
| Smith, William | 0 | 5 | 0 |
| Spence, W. | 0 | 5 | 0 |
| Stephenson, F. | 0 | 5 | 0 |
| Stephenson, J. B. | 1 | 1 | 0 |
| Stewart, A. K. | 0 | 5 | 0 |
| Swan, W. | 0 | 5 | 0 |
| Symington, Thomas | 0 | 10 | 6 |
| Thomson, Isaac W. | 0 | 5 | 0 |
| Walker, D. | 0 | 5 | 0 |
| Wylie, David N. | 0 | 5 | 0 |
| Young, J. R., jun. | 0 | 5 | 0 |

### Edmonton (Middlesex).

| | | | |
|---|---|---|---|
| Ragg, W. | 1 | 1 | 0 |
| Ragg, W. W. | 0 | 10 | 0 |

### Egham.

| | | | |
|---|---|---|---|
| Bartholomew, William | 0 | 10 | 6 |

### Elgin.

| | | | |
|---|---|---|---|
| Robertson, William | 0 | 5 | 0 |
| Thomson, Robert | 0 | 5 | 0 |

### Eltham (Kent).

| | | | |
|---|---|---|---|
| Mellin, C. J. | 0 | 5 | 0 |
| Rawlinson, Mrs. M. | 1 | 1 | 0 |

### Ely.

| | | | |
|---|---|---|---|
| Ellis, H. A. | 0 | 2 | 6 |
| Gulliver, G. E. | 0 | 5 | 0 |
| Lincolne, William | 0 | 10 | 6 |

### Enfield.

| | | | |
|---|---|---|---|
| Gange, George | 1 | 1 | 0 |

### Englefield Green (Surrey).

| | | | |
|---|---|---|---|
| Miller, G. F. | 0 | 5 | 0 |

### Epping.

| | | | |
|---|---|---|---|
| Rowland, T. W. | 0 | 10 | 6 |

### Epsom.

| | | | |
|---|---|---|---|
| Oxley, Frederic | 0 | 5 | 0 |
| Tottle, Henry John | 0 | 5 | 0 |

### Erith (Kent).

| | | | |
|---|---|---|---|
| Howard, G. W. | 0 | 10 | 6 |
| West, J. A. | 0 | 5 | 0 |

### Esher.

| | | | |
|---|---|---|---|
| Parrott, J. | 0 | 10 | 6 |

### Evesham.

| | | | |
|---|---|---|---|
| Pumphrey, J. H. (Bengeworth) | 0 | 5 | 0 |

### Exeter.

| | | | |
|---|---|---|---|
| Adams, J. H. | 0 | 5 | 0 |
| Bartleet, John | 0 | 5 | 0 |
| Botting, Charles | 0 | 5 | 0 |
| Bulley, William H. | 0 | 5 | 0 |

### Exeter—continued.

| | £ | s. | d. |
|---|---|---|---|
| Gadd, Henry | 0 | 10 | 6 |
| Gadd, H. W | 0 | 5 | 0 |
| Harris, H. W. | 0 | 10 | 6 |
| Harrold, C. J. | 0 | 2 | 6 |
| Lake, John H. | 0 | 10 | 6 |
| Lemmon, Eric | 0 | 5 | 0 |
| Milton, Thomas C. | 0 | 10 | 6 |
| Napier, George L. | 0 | 5 | 0 |
| Pasmore, George | 0 | 5 | 0 |
| Stocker, George | 0 | 10 | 6 |
| Tighe, H. W. | 0 | 5 | 0 |
| Townsend, J. | 0 | 10 | 6 |
| Tucker, W. S. M. | 0 | 2 | 6 |
| Wearing, W. H. | 0 | 5 | 0 |
| Webber, J. W. | 0 | 5 | 0 |

### Exmouth.

| | | | |
|---|---|---|---|
| Bickford, J. T. | 0 | 5 | 0 |
| Toone, A. H. | 0 | 10 | 6 |

### Eye.

| | | | |
|---|---|---|---|
| Flowerdew, R. | 0 | 10 | 6 |

### Eynsham.

| | | | |
|---|---|---|---|
| Howe, Henry A. | 0 | 5 | 0 |

### Fakenham.

| | | | |
|---|---|---|---|
| Searle, Mrs. M. | 0 | 10 | 0 |

### Falkirk.

| | | | |
|---|---|---|---|
| Murdoch, David | 0 | 10 | 6 |

### Falmouth.

| | | | |
|---|---|---|---|
| Newman, Walter F. | 0 | 5 | 0 |
| Solomon, W. H. | 0 | 10 | 6 |

### Fareham.

| | | | |
|---|---|---|---|
| Batchelor, Alfred E. | 0 | 5 | 0 |
| Batchelor, Charles | 0 | 5 | 0 |
| Franklin, Alfred | 0 | 5 | 0 |

### Faringdon.

| | | | |
|---|---|---|---|
| Cook, W. R. | 0 | 5 | 0 |

### Farnham.

| | | | |
|---|---|---|---|
| Griffith, J. | 0 | 10 | 6 |

### Farnworth.

| | | | |
|---|---|---|---|
| Watkinson, H. A. | 0 | 2 | 6 |

### Faversham.

| | | | |
|---|---|---|---|
| Jenkins, E. | 0 | 5 | 0 |
| Laxon, M. | 0 | 5 | 0 |

### Felixstowe.

| | | | |
|---|---|---|---|
| Brown, F. E. | 0 | 5 | 0 |

### Felling.

| | | | |
|---|---|---|---|
| Maillard, R. W. | 0 | 5 | 0 |

### Fenton.

| | | | |
|---|---|---|---|
| Knight, Jesse | 0 | 5 | 0 |
| Massey, Stephen | 0 | 5 | 0 |

### Finchley (East)

| | | | |
|---|---|---|---|
| Smith, W. | 0 | 10 | 6 |

### Fleckney (Leicestershire).

| | | | |
|---|---|---|---|
| Deacon, Fanny E. | 0 | 5 | 0 |

### Fleetwood.

| | | | |
|---|---|---|---|
| Lofthouse, J. | 0 | 5 | 0 |

### Flint.

| | | | |
|---|---|---|---|
| Jones, O. W. | 0 | 5 | 0 |

### Folkestone.

| | | | |
|---|---|---|---|
| Bishop, E. J. | 1 | 1 | 0 |
| Lea, F. J. | 0 | 5 | 0 |
| Lea, John | 0 | 10 | 6 |
| Stainer, John | 0 | 10 | 6 |

### Forfar.

| | | | |
|---|---|---|---|
| Fowler, G. R. | 0 | 5 | 0 |

### Fort William.

| | | | |
|---|---|---|---|
| MacFarlane, P. | 0 | 5 | 0 |

### Foulsham.

| | | | |
|---|---|---|---|
| Maddison, Mary | 0 | 5 | 0 |

### Fowey.

| | | | |
|---|---|---|---|
| Wellington, J. | 0 | | 6 |

### Fraserburgh.

| | | | |
|---|---|---|---|
| Burnett, Robert | 0 | 5 | 0 |

### Friockheim.

| | £ | s. | d. |
|---|---|---|---|
| Buchan, D. D. | 0 | 2 | 6 |

### Frodsham (Cheshire).

| | | | |
|---|---|---|---|
| Dunsford, F. W. | 0 | 5 | 0 |
| Jones, J. M. | 0 | 5 | 0 |

### Frome.

| | | | |
|---|---|---|---|
| Green, E. C. F. | 0 | 5 | 0 |
| Harrold, F. | 0 | 10 | 0 |
| Hodder, G. W. | 0 | 5 | 0 |

### Gainsborough.

| | | | |
|---|---|---|---|
| Forrest, Richard Wm. | 0 | 10 | 6 |
| Surfleet, A. G. | 0 | 5 | 0 |
| Thompson, George | 0 | 10 | 6 |

### Galashiels.

| | | | |
|---|---|---|---|
| Cartwright, B. | 0 | 2 | 6 |
| Noble, A. | 0 | 2 | 6 |
| Ponstie, J. H. | 0 | 2 | 6 |
| Ross, W. | 0 | 5 | 0 |
| Wilkie, A. L | 0 | 2 | 6 |

### Garstang.

| | | | |
|---|---|---|---|
| Thomas, J. J. | 0 | 5 | 0 |

### Gateshead-on-Tyne.

| | | | |
|---|---|---|---|
| Elliott, Robert | 0 | 10 | 6 |
| Greenwell, William C. | 0 | 5 | 0 |

### Geneva.

| | | | |
|---|---|---|---|
| Coulson, T. | 0 | 2 | 6 |

### Glasgow.

| | | | |
|---|---|---|---|
| Adam, T. | 0 | 5 | 0 |
| Boyd, A. | 0 | 2 | 6 |
| Brodie, Robert | 0 | 5 | 0 |
| Conacher, D. | 0 | 5 | 0 |
| Crawford, David | 0 | 2 | 6 |
| Currie, John (Eglinton Street) | 0 | 5 | 0 |
| Currie, John (Sauchiehall Street) | 0 | 5 | 0 |
| Currie, W. L. | 0 | 5 | 0 |
| Dickie, James | 0 | 5 | 0 |
| Dunlop, J. | 0 | 5 | 0 |
| Dunlop, Thomas | 0 | 5 | 0 |
| Fenwick, John | 0 | 5 | 0 |
| Foster, John | 0 | 10 | 6 |
| Frazer, Daniel | 1 | 1 | 0 |
| Garry, George | 0 | 5 | 0 |
| Glasgow Apothecaries' Co. | 1 | 1 | 0 |
| Greig, W. | 0 | 10 | 6 |
| Harrower, Peter | 0 | 5 | 0 |
| Kinninmont, Alexander | 1 | 1 | 0 |
| Lambie, Hugh | 0 | 5 | 0 |
| Laurence, John | 0 | 10 | 6 |
| McKellar, A. | 0 | 2 | 0 |
| McMillan, John | 1 | 1 | 0 |
| McMillan, J. M. | 0 | 5 | 0 |
| Miller, J. W. | 0 | 5 | 0 |
| Paris, W. | 0 | 5 | 0 |
| Peacock, J. R. | 0 | 5 | 0 |
| Reid, D. S. C. | 0 | 5 | 0 |
| Rose, Alexander | 0 | 10 | 6 |
| Thomson, William | 0 | 5 | 0 |
| Wallace, W. | 0 | 10 | 0 |
| Whitelaw, James | 1 | 1 | 0 |

### Gloucester.

| | | | |
|---|---|---|---|
| Berry and Son | 0 | 5 | 0 |
| Franklin, James | 0 | 5 | 0 |
| Hughes, Evan G. | 1 | 1 | 0 |
| Jenkins, Henry | 0 | 5 | 0 |
| Meadows, Henry | 0 | 10 | 6 |
| Minchin, W. | 0 | 5 | 0 |
| Sadleir, John | 0 | 10 | 6 |
| Slinn, H. E. | 0 | 5 | 0 |
| Stafford, William | 0 | 10 | 6 |
| Trigg, James W. | 0 | 5 | 0 |
| Ward, Joseph | 0 | 10 | 6 |

### Goole.

| | | | |
|---|---|---|---|
| Buck, W. H. | 0 | 5 | 0 |

### Gosforth.

| | | | |
|---|---|---|---|
| Gaitskell, James | 0 | 5 | 0 |

### Gosport.

| | | | |
|---|---|---|---|
| Houghton, R. W. | 0 | 5 | 0 |

### Govan.

| | | | |
|---|---|---|---|
| Skinner, John | 0 | 5 | 0 |

### Gowerton.

| | | | |
|---|---|---|---|
| Jones, Ivor L. | 0 | 5 | 0 |

### Grangemouth.

| | | | |
|---|---|---|---|
| Baxter, J. | 0 | 5 | 0 |

### Grantham.

| | £ | s. | d. |
|---|---|---|---|
| Fisher, F. D. | 0 | 5 | 0 |
| Hall, Mrs. Arnold | 0 | 10 | 6 |
| Hopkinson, H. | 0 | 5 | 0 |
| Hunt, Thomas | 0 | 5 | 0 |
| Whysall, William | 0 | 10 | 6 |
| Wilkinson, W. | 0 | 10 | 6 |

### Gravesend.

| | | | |
|---|---|---|---|
| Clarke, Richard F. | 1 | 1 | 0 |
| Knight, P. | 0 | 2 | 6 |
| Morris, J. H. | 0 | 5 | 0 |
| Sharman, C. R. | 0 | 5 | 0 |

### Great Broughton (Cumb.).

| | | | |
|---|---|---|---|
| Penny, J. | 0 | 10 | 6 |

### Greenhithe.

| | | | |
|---|---|---|---|
| Reid, C. S. | 0 | 2 | 6 |

### Greenock.

| | | | |
|---|---|---|---|
| Ferguson, J. | 0 | 2 | 6 |

### Grimsby.

| | | | |
|---|---|---|---|
| Barker, William | 0 | 5 | 0 |
| Botterill, William | 0 | 5 | 0 |
| Cook, Robert | 0 | 5 | 0 |
| Dewing, C. | 0 | 5 | 0 |
| Mason, William D. | 0 | 2 | 6 |
| Robinson, Jonathan Scott | 0 | 10 | 6 |
| Wharton, J. | 0 | 2 | 6 |
| White, J. C. | 0 | 2 | 6 |
| Willey, W. | 0 | 5 | 0 |

### Guernsey.

| | | | |
|---|---|---|---|
| Burgess, A. L. | 0 | 2 | 6 |
| Carre, J. H. | 0 | 2 | 6 |
| Nickolls, J. B. | 0 | 5 | 0 |

### Guildford.

| | | | |
|---|---|---|---|
| Farrow, A. E. | 0 | 5 | 0 |
| Inman, T. L. | 0 | 5 | 0 |
| Jeffries, Henry | 1 | 1 | 0 |
| Long, A. J. T. | 0 | 5 | 0 |
| Thompson, Thomas | 0 | 5 | 0 |
| Wheeler, Frederick | 0 | 5 | 0 |

### Guisborough.

| | | | |
|---|---|---|---|
| Bancks, Mrs. | 0 | 5 | 0 |
| Fairburn, Robert W. | 0 | 5 | 0 |

### Haddington.

| | | | |
|---|---|---|---|
| Gardiner, D. | 0 | 5 | 0 |
| Watt, James and J. | 1 | 1 | 0 |

### Hadleigh.

| | | | |
|---|---|---|---|
| Slater, W. M. | 0 | 2 | 6 |

### Hailsham.

| | | | |
|---|---|---|---|
| Oxley, G. | 0 | 2 | 6 |

### Halesworth.

| | | | |
|---|---|---|---|
| Gostling, John H. | 0 | 5 | 0 |

### Halifax.

| | | | |
|---|---|---|---|
| Bottomley, W. | 0 | 5 | 0 |
| Brierley, H. C. | 0 | 2 | 6 |
| Brierley, J. B. | 0 | 2 | 6 |
| Dyer, William | 0 | 5 | 0 |
| Fielding, C. | 0 | 2 | 6 |
| Haigh, W. | 0 | 5 | 0 |
| Patchett, J. | 0 | 2 | 6 |
| Seely, H. W. | 0 | 5 | 0 |
| Swire, Jabez | 0 | 5 | 0 |
| Thompson, W. S. | 0 | 2 | 6 |

### Halstead.

| | | | |
|---|---|---|---|
| Marlar, John F. | 0 | 2 | 6 |

### Hambledon.

| | | | |
|---|---|---|---|
| Wedge, G. D. | 0 | 2 | 6 |

### Hampton Wick.

| | | | |
|---|---|---|---|
| Miller, C. S. | 0 | 5 | 0 |

### Hanley.

| | | | |
|---|---|---|---|
| Cornwell, T. C. | 0 | 5 | 0 |
| Furnival, John D. | 0 | 5 | 0 |
| Hartle, W. | 0 | 2 | 6 |
| Heap, J. H. | 0 | 5 | 0 |
| Hutchinson, J. | 0 | 5 | 0 |
| Insull, E. S. | 0 | 5 | 0 |
| Jones, E. | 0 | 5 | 0 |
| Moore, John William | 0 | 5 | 0 |
| Parr, F. R. | 0 | 2 | 6 |
| Turrell, J. | 0 | 5 | 0 |
| Waldron, J. H. | 0 | 5 | 0 |

### Harleston.

| | £ | s. | d. |
|---|---|---|---|
| Churchyard, A. E. I. | 0 | 2 | 6 |
| Fisher, W. H. | 0 | 5 | 0 |
| Woods, Charles | 0 | 5 | 0 |

### Harrogate.

| | | | |
|---|---|---|---|
| Davis, Richard H. | 0 | 10 | 6 |
| Greenwood, Charles | 0 | 10 | 6 |
| Hannah, H. | 0 | 2 | 6 |
| Haward, G. R. | 1 | 1 | 0 |
| Reynolds, Freshfield | 0 | 10 | 6 |
| Shaw, B. | 0 | 10 | 6 |
| Weston, G. | 0 | 5 | 0 |
| Wilson and Son | 1 | 1 | 0 |
| Wood, A. W. | 0 | 5 | 0 |

### Harrow.

| | | | |
|---|---|---|---|
| Gunn, S. J. | 0 | 10 | 6 |
| Hartley, S. | 0 | 5 | 0 |

### Hartley Wintney.

| | | | |
|---|---|---|---|
| Machin, W. G. | 0 | 5 | 0 |

### Harwich.

| | | | |
|---|---|---|---|
| Bevan, Charles F. | 0 | 10 | 6 |
| Worts, Augustine | 0 | 5 | 0 |

### Haslingden.

| | | | |
|---|---|---|---|
| Blayney, Joseph J. | 0 | 5 | 0 |

### Hastings and St. Leonards.

| | | | |
|---|---|---|---|
| Beck, Albert N. | 0 | 5 | 0 |
| Bolshaw, A. E. | 0 | 5 | 0 |
| Bolton, Thomas | 0 | 5 | 0 |
| Brooker, Algernon | 0 | 5 | 0 |
| Brooks, Frederick | 0 | 5 | 0 |
| Crisford, F. J. | 0 | 2 | 6 |
| Curtis, H. E. | 0 | 5 | 0 |
| Daws, W. K. | 0 | 10 | 6 |
| Feaver, John | 0 | 10 | 6 |
| French, Miss E. | 0 | 5 | 0 |
| Greenhill, S. O. | 0 | 5 | 0 |
| Hasselby, E. H. | 0 | 10 | 6 |
| Jameson, W. E. | 1 | 1 | 0 |
| Jenner, H. A. | 0 | 5 | 0 |
| Keyworth, G. A. | 0 | 10 | 6 |
| Mackenzie, C. A. | 0 | 2 | 6 |
| Maggs, F. W. | 0 | 5 | 0 |
| Maggs, Samuel B. | 0 | 10 | 0 |
| Neve, Mary E. B. | 0 | 5 | 0 |
| Pay, H. H. | 0 | 5 | 0 |
| Ripley, E. | 0 | 2 | 6 |
| Rossiter, Frederick | 0 | 10 | 6 |
| Skyrme, C. G. (donation) | 5 | 5 | 0 |
| Snowdon, Robert | 0 | 5 | 0 |
| Tharle, C. A. | 0 | 10 | 6 |
| Tree, F. | 0 | 10 | 6 |
| Tree, J. | 0 | 2 | 6 |
| Vint, Thomas D. | 0 | 5 | 0 |

### Haverfordwest.

| | | | |
|---|---|---|---|
| Jenkins, Jabez (Lysyfrân) | 0 | 5 | 0 |
| Saunders, Charles P. | 0 | 10 | 6 |
| Saunders, David P. | 0 | 10 | 6 |

### Hawick.

| | | | |
|---|---|---|---|
| Craig, John | 0 | 5 | 0 |
| Maben, Thomas | 1 | 1 | 0 |
| Turnbull, W. S. | 0 | 2 | 6 |

### Hay.

| | | | |
|---|---|---|---|
| Davies, J. F. | 0 | 2 | 6 |
| Davies, John Lutwyche | 0 | 5 | 0 |

### Hayward's Heath.

| | | | |
|---|---|---|---|
| Cripps, R. A. | 0 | 10 | 6 |
| Hays, R. T. O. | 0 | 5 | 0 |

### Heaton Chapel.

| | | | |
|---|---|---|---|
| Thorp, John | 1 | 1 | 0 |

### Hebden Bridge.

| | | | |
|---|---|---|---|
| Hey, David | 0 | 10 | 6 |

### Heckington.

| | | | |
|---|---|---|---|
| Sumners, Michael Cole | 0 | 5 | 0 |

### Heckmondwike.

| | | | |
|---|---|---|---|
| Stead, W. | 0 | 5 | 0 |

### Hedon.

| | | | |
|---|---|---|---|
| Soutter, J. S. | 0 | 10 | 6 |

### Helensburgh.

| | | | |
|---|---|---|---|
| Harvie, George | 0 | 5 | 0 |
| McMurray, J. | 0 | 5 | 0 |

### Helmsley.

| | | | |
|---|---|---|---|
| Allenby, W. | 0 | 10 | 6 |

### Helston.

| | £ | s. | d. |
|---|---|---|---|
| Wakeham, Charles | 0 | 5 | 0 |

### Hemel Hempstead.

| | | | |
|---|---|---|---|
| Ellis, C. J. | 0 | 2 | 6 |
| Wilkinson, C. E. | 0 | 5 | 0 |

### Hemsworth (Yorks.).

| | | | |
|---|---|---|---|
| Hodgson, G. | 0 | 10 | 6 |

### Hendon.

| | | | |
|---|---|---|---|
| Goldfinch, G. | 0 | 10 | 6 |
| Hartridge, J. H. | 0 | 5 | 0 |

### Henley-on-Thames.

| | | | |
|---|---|---|---|
| Batchelor, C. J. H. | 0 | 5 | 0 |

### Hereford.

| | | | |
|---|---|---|---|
| Guy, E. | 0 | 5 | 0 |
| Haines, W. E. | 0 | 5 | 0 |
| Jackson, J. J. | 0 | 10 | 6 |
| Walker, John | 0 | 10 | 6 |
| Williams, W. and H. B. | 0 | 10 | 6 |

### Hertford.

| | | | |
|---|---|---|---|
| Durrant, G. R. | 0 | 10 | 6 |
| LaTreille, A. | 0 | 2 | 6 |
| Lines, G. | 0 | 10 | 6 |

### Hexham.

| | | | |
|---|---|---|---|
| Gibson, J. P. | 0 | 10 | 6 |
| Richardson, George | 0 | 6 | 0 |
| Riddle, W. R. | 0 | 5 | 0 |

### High Wycombe.

| | | | |
|---|---|---|---|
| Butler, W. H. | 0 | 2 | 6 |
| Dowswell, C. W. | 0 | 2 | 6 |
| Rosser, W. M. | 0 | 5 | 0 |
| Wilford, J. | 0 | 5 | 0 |
| Young, H. E. | 0 | 2 | 6 |

### Highworth (Wilts).

| | | | |
|---|---|---|---|
| Ballard, Edwin | 0 | 5 | 0 |

### Hitchin.

| | | | |
|---|---|---|---|
| Llewellyn and Perks | 1 | 1 | 0 |
| Ransom and Son | 1 | 1 | 0 |
| Tearle, W. | 0 | 5 | 0 |

### Holyhead.

| | | | |
|---|---|---|---|
| Roberts, T. J. | 0 | 10 | 6 |

### Hong Kong (China).

| | | | |
|---|---|---|---|
| Browne, F. | 0 | 5 | 0 |
| Gregson, J. | 0 | 5 | 0 |

### Honley.

| | | | |
|---|---|---|---|
| Broadbent, John B. | 0 | 10 | 6 |

### Horncastle.

| | | | |
|---|---|---|---|
| Betts, William | 0 | 5 | 0 |
| Carlton, H. | 0 | 10 | 6 |

### Hornsea.

| | | | |
|---|---|---|---|
| Morrow, C. | 0 | 5 | 0 |

### Horsforth.

| | | | |
|---|---|---|---|
| Wynn, F. | 0 | 5 | 0 |

### Horton (Bucks).

| | | | |
|---|---|---|---|
| Passingham, G. W. | 0 | 10 | 6 |

### Horwich (Lancs.).

| | | | |
|---|---|---|---|
| Phillips, S. | 0 | 5 | 0 |

### Houghton-le-Spring.

| | | | |
|---|---|---|---|
| Rowell, R. H. | 0 | 10 | 6 |

### Hounslow.

| | | | |
|---|---|---|---|
| Bowering, John | 0 | 5 | 0 |
| Cull, Joseph | 0 | 10 | 6 |

### Howden (Yorks.).

| | | | |
|---|---|---|---|
| Loam, J. G. | 0 | 5 | 0 |

### Hoylake.

| | | | |
|---|---|---|---|
| Pask, T. C. | 0 | 5 | 0 |

### Hucknall Torkard.

| | | | |
|---|---|---|---|
| Heath, J. W. | 0 | 5 | 0 |

### Huddersfield.

| | | | |
|---|---|---|---|
| Buckley, H. | 0 | 5 | 0 |
| Bygott, W. J. | 0 | 2 | 6 |
| Cockcroft, J. W. | 0 | 5 | 0 |
| Dickinson, J. H. | 0 | 5 | 0 |
| Duffin, T. | 0 | 10 | 6 |

### Huddersfield—continued.

| | £ | s. | d. |
|---|---|---|---|
| Fell, R. | 0 | 10 | 0 |
| King, William | 1 | 1 | 0 |
| Needham, T. | 0 | 5 | 0 |
| Piggott, W. F. | 0 | 5 | 0 |
| Spurr, H. E. | 0 | 5 | 0 |
| Swift, C. H. | 0 | 5 | 0 |
| Sykes, H. | 0 | 5 | 0 |
| Wadsworth, E. | 0 | 5 | 0 |
| Walshaw, R. O. | 0 | 10 | 6 |
| Wheatley, Charles | 0 | 10 | 0 |
| Wilkinson, J. H. V. | 0 | 5 | 0 |
| Woods, J. B. | 0 | 5 | 0 |

### Hull.

| | | | |
|---|---|---|---|
| Akester J. C. | 0 | 5 | 0 |
| Allison, E. and H. | 1 | 1 | 0 |
| Bell, Charles B. | 1 | 1 | 0 |
| Bousfield, W. | 0 | 2 | 6 |
| Burnett, W. | 0 | 2 | 0 |
| Campbell, Charles | 0 | 5 | 0 |
| Chapman, E. J. | 0 | 5 | 0 |
| Chapman, Joseph | 0 | 5 | 0 |
| Creasser, Matthew | 0 | 5 | 0 |
| Day, W. | 0 | 2 | 6 |
| Desforge, J. H. | 0 | 5 | 0 |
| Dobson, J. B. | 0 | 5 | 0 |
| Dyson, George | 0 | 5 | 0 |
| Earle, E. H. | 1 | 1 | 0 |
| Fowler, E. | 0 | 5 | 0 |
| Gibson, C. P. (Trustees of) | 0 | 5 | 0 |
| Grindell, John | 0 | 10 | 6 |
| Hall, Henry R. F. | 0 | 5 | 0 |
| Hammond, William H. | 0 | 5 | 0 |
| Hebblethwaite, G. A. | 0 | 2 | 6 |
| Hoyles, George | 0 | 5 | 0 |
| Johnson, F. E. | 0 | 5 | 0 |
| Keer, Mrs. A. | 0 | 2 | 6 |
| Kellington, M. L. | 0 | 2 | 6 |
| Kenny, Thomas | 0 | 10 | 6 |
| Kirton, C. H. | 0 | 5 | 0 |
| Lambert, F. E. | 0 | 5 | 0 |
| Linford, John S. | 1 | 1 | 0 |
| Lofthouse and Saltmer | 1 | 1 | 0 |
| Markham, A. D. | 0 | 2 | 6 |
| Metcalfe, A. P. | 0 | 5 | 0 |
| Milner, J. G. | 0 | 2 | 6 |
| Morris, E. S. | 0 | 5 | 0 |
| Mould, J. S. | 0 | 2 | 6 |
| Newton, G. R. | 0 | 2 | 6 |
| Oldham, James | 0 | 5 | 0 |
| Raynor, A. | 0 | 5 | 0 |
| Richardson, A. | 0 | 5 | 0 |
| Ryley, E. | 0 | 2 | 6 |
| Savege, E. | 0 | 2 | 6 |
| Selle, I. S. | 0 | 5 | 0 |
| Shaw, Ward | 0 | 5 | 0 |
| Sheffield, A. J. | 0 | 7 | 6 |
| Smith, E. C. H. | 0 | 2 | 6 |
| Staning, Walter | 0 | 5 | 0 |
| Stoakes, Benjamin M. | 0 | 5 | 0 |
| Thirsk, A. T. | 0 | 2 | 6 |
| Thompson, H. E. | 0 | 2 | 6 |
| Walker, C. | 0 | 2 | 0 |
| Wilson, J. | 0 | 5 | 0 |

### Hunstanton.

| | | | |
|---|---|---|---|
| Twiss, Wm. | 0 | 10 | 6 |

### Huntingdon.

| | | | |
|---|---|---|---|
| Alexander, W. B. | 0 | 10 | 6 |
| Baxter, Robert | 0 | 10 | 6 |
| Cooper, A. | 0 | 2 | 6 |

### Huntly (N.B.).

| | | | |
|---|---|---|---|
| Chalmers, G. | 0 | 2 | 6 |

### Hurstpierpoint.

| | | | |
|---|---|---|---|
| Hudson, Alfred W. | 0 | 2 | 6 |

### Husbands Bosworth.

| | | | |
|---|---|---|---|
| Clerke, W. B. | 0 | 5 | 0 |

### Hyde.

| | | | |
|---|---|---|---|
| Oldfield, Henry | 0 | 10 | 6 |

### Hyogo (Japan).

| | | | |
|---|---|---|---|
| Franklin, J. W. | 0 | 5 | 0 |

### Hythe.

| | | | |
|---|---|---|---|
| Lemmon, R. A. | 1 | 1 | 0 |

### Ilfracombe.

| | | | |
|---|---|---|---|
| Affleck, T. S. | 0 | 2 | 6 |
| Crang, Walter | 1 | 1 | 0 |
| Thornley, C. | 1 | 1 | 0 |
| Wheeler, James | 0 | 5 | 0 |

### Ilkeston.

| | £ | s. | d. |
|---|---|---|---|
| Potts, Charles | 1 | 1 | 0 |

### Ilkley.

| | | | |
|---|---|---|---|
| Harvey, W. | 1 | 1 | 0 |
| Worfolk, G. W. | 0 | 10 | 6 |

### Inverness.

| | | | |
|---|---|---|---|
| Allan, Alexander | 0 | 5 | 0 |
| Fraser, John | 0 | 5 | 0 |
| Galloway, Son and McLeod | 0 | 5 | 0 |
| Junor, J. | 0 | 2 | 6 |
| MacRitchie, D. | 0 | 5 | 0 |
| Mitchell, H. | 0 | 5 | 0 |
| Ogston, W. | 0 | 5 | 0 |

### Ipswich.

| | | | |
|---|---|---|---|
| Anness, Samuel R. | 0 | 10 | 6 |
| Blomfield, F. H. | 0 | 5 | 0 |
| Clifton, E. S. | 0 | 5 | 0 |
| Cornell, William | 1 | 1 | 0 |
| Cossey, James D. | 0 | 10 | 6 |
| Eyre, H. R. | 0 | 5 | 0 |
| Grimwade, Ridley and Co. | 0 | 10 | 6 |
| Jackson, J. T. | 0 | 5 | 0 |
| Marsh, W. H. | 0 | 5 | 0 |
| Matcham, Edward | 0 | 5 | 0 |
| Miller, T. T. | 0 | 5 | 0 |
| Nunn, C. G. | 0 | 5 | 0 |
| Pain, A. | 1 | 1 | 0 |
| Palmer, F. H. | 0 | 5 | 0 |
| Wiggin, J. C. | 0 | 10 | 6 |

### Irvine.

| | | | |
|---|---|---|---|
| Gillespie, James | 0 | 2 | 6 |

### Isleworth.

| | | | |
|---|---|---|---|
| Reece, James | 0 | 5 | 0 |

### Iwerne Minster.

| | | | |
|---|---|---|---|
| Humby, L. W. | 0 | 5 | 0 |

### Jarrow-on-Tyne.

| | | | |
|---|---|---|---|
| Hopper, Richard | 0 | 5 | 0 |

### Jedburgh.

| | | | |
|---|---|---|---|
| Strachan, J. | 0 | 2 | 6 |
| Walker, A. | 0 | 5 | 0 |

### Jersey.

| | | | |
|---|---|---|---|
| Cole, George | 1 | 1 | 0 |
| Millais, Mrs. | 1 | 1 | 0 |
| Miller, Henry | 0 | 5 | 0 |
| Poingdestre, C. R. | 0 | 10 | 6 |

### Keighley.

| | | | |
|---|---|---|---|
| Riddiough, F. | 0 | 5 | 0 |

### Keith.

| | | | |
|---|---|---|---|
| Pirie, J. | 0 | 2 | 6 |

### Kelso.

| | | | |
|---|---|---|---|
| Alexander, W. M. | 0 | 5 | 0 |

### Kendal.

| | | | |
|---|---|---|---|
| Bateson, Thomas | 0 | 10 | 6 |
| Burton, Matthew | 1 | 1 | 0 |
| Hind, Thomas W. L. | 1 | 1 | 0 |
| Rigg, G. F. | 0 | 10 | 6 |
| Severs, Joseph | 0 | 10 | 6 |

### Keswick.

| | | | |
|---|---|---|---|
| Townley, Thomas W. | 0 | 10 | 6 |

### Kettering.

| | | | |
|---|---|---|---|
| Baker, J. | 1 | 1 | 0 |
| Cox, H. S. | 0 | 5 | 0 |
| Pollard, C. | 1 | 1 | 0 |
| Thursfield, John F. | 0 | 10 | 0 |
| Thursfield, J. H. | 0 | 2 | 6 |

### Kew.

| | | | |
|---|---|---|---|
| Edwards, J. E. | 0 | 10 | 6 |

### Kibworth Beauchamp.

| | | | |
|---|---|---|---|
| Freeland, A. J. | 0 | 2 | 6 |

### Kidsgrove.

| | | | |
|---|---|---|---|
| Griffiths, Edwin H. | 0 | 10 | 6 |

### Kidwelly.

| | | | |
|---|---|---|---|
| Jones, L. | 0 | 2 | 6 |

### Kilmarnock.

| | | | |
|---|---|---|---|
| Borland, John | 1 | 1 | 0 |
| Borland, John, jun. | 0 | 10 | 6 |

### King's Bridge (Devon).

| | | | |
|---|---|---|---|
| Stewart, R. McA. | 0 | 5 | 0 |

### King's Lynn.

| | £ | s. | d. |
|---|---|---|---|
| Atmore, E. A. | 0 | 5 | 0 |
| Palmer, W. J. | 0 | 5 | 0 |

### Kingston-on-Thames.

| | | | |
|---|---|---|---|
| Bond, C. R. | 0 | 10 | 6 |
| Brewster, William | 0 | 10 | 6 |
| Clarke, W. E. | 0 | 5 | 0 |
| Higgs, Alfred | 0 | 5 | 0 |
| Mumbray, R. G. | 0 | 10 | 6 |
| Walmsley, Samuel | 0 | 5 | 0 |
| Whaley, Edward | 0 | 10 | 6 |

### Kirkby-in-Furness.

| | | | |
|---|---|---|---|
| Postlethwaite, T. | 0 | 2 | 6 |

### Kirkealdy.

| | | | |
|---|---|---|---|
| Allan, H. W. F. | 0 | 2 | 6 |
| Key, G. B. | 0 | 5 | 0 |
| Storrar, David | 1 | 1 | 0 |

### Knaresborough.

| | | | |
|---|---|---|---|
| Lawrence, W. P. | 0 | 5 | 0 |

### Knutsford.

| | | | |
|---|---|---|---|
| Jackson, William | 0 | 5 | 0 |
| Silvester, Henry T. | 0 | 5 | 0 |

### Lampeter.

| | | | |
|---|---|---|---|
| Evans, R. | 0 | 5 | 0 |

### Lancaster.

| | | | |
|---|---|---|---|
| Arkle, William | 0 | 5 | 0 |
| Briggs, W. | 1 | 1 | 0 |
| Lund, W. J. | 0 | 10 | 6 |
| Marshall, C. B. | 0 | 5 | 0 |
| Troughton, Henry | 0 | 5 | 0 |
| Vince, James | 0 | 5 | 0 |
| Wyatt, W. | 0 | 10 | 6 |

### Landore (Glam.).

| | | | |
|---|---|---|---|
| Dryden, T. | 0 | 10 | 6 |

### Langholm.

| | | | |
|---|---|---|---|
| Beattie, Thomas | 0 | 5 | 0 |

### Largs (N.B.).

| | | | |
|---|---|---|---|
| Barr, Bryce | 0 | 5 | 0 |

### Laugharne.

| | | | |
|---|---|---|---|
| Johns, J. | 0 | 2 | 6 |

### Launceston.

| | | | |
|---|---|---|---|
| Downing, Frederick | 0 | 5 | 0 |
| Wise, William | 0 | 5 | 0 |

### Leamington.

| | | | |
|---|---|---|---|
| Barnitt, John | 0 | 10 | 6 |
| Barrett, J. R. | 0 | 2 | 0 |
| Barrett, Josephus T. | 1 | 1 | 0 |
| Bloomfield, E. | 0 | 2 | 6 |
| Davis, Benjamin | 0 | 10 | 0 |
| Davis, C. | 0 | 10 | 0 |
| England, A. | 0 | 2 | 0 |
| Forrester, — | 0 | 2 | 0 |
| Heath, W. G. | 0 | 2 | 6 |
| Hutton, H. | 0 | 10 | 0 |
| Lamplough, J. W. | 0 | 5 | 0 |
| Marriott, T. E. | 0 | 10 | 6 |
| Price, J. | 0 | 5 | 0 |
| Robinson, J. J. | 0 | 5 | 0 |
| Rookledge, F. | 0 | 2 | 6 |
| Sansom, Henry | 0 | 2 | 0 |
| Smith, Samuel A. | 1 | 1 | 0 |
| Smith, Samuel H. | 1 | 1 | 0 |
| Snook, F. | 0 | 2 | 0 |
| Stanley, Herbert | 0 | 10 | 6 |
| Stent, F. R. | 0 | 2 | 6 |
| Vaughan, E. E | 0 | 2 | 6 |
| Wilson, G. P. | 0 | 5 | 0 |

### Ledbury.

| | | | |
|---|---|---|---|
| Freeman, Ernest | 0 | 10 | 6 |

### Leeds.

| | | | |
|---|---|---|---|
| Barrow, E. | 0 | 5 | 0 |
| Beacock, J. H. | 0 | 5 | 0 |
| Bilbrough, A. | 1 | 1 | 0 |
| Branson, F. W. | 0 | 10 | 6 |
| Briggs, George | 0 | 10 | 6 |
| Brown, Edward | 0 | 10 | 0 |
| Catterall, C. G. | 0 | 10 | 6 |
| Cole, E. H. | 1 | 1 | 0 |
| Day, J. | 0 | 5 | 0 |
| Drewry, J. | 0 | 2 | 6 |
| Exley, John | 0 | 5 | 0 |
| Fawthorp, James | 0 | 5 | 0 |

### Leeds—continued.

| | £ | s. | d. |
|---|---|---|---|
| Fearnley, F. | 0 | 2 | 6 |
| Fox, W. A. | 0 | 2 | 6 |
| Goodall, Backhouse and Co. | 2 | 2 | 0 |
| Greasley, M. F. | 0 | 10 | 6 |
| Hardcastle, J. | 0 | 5 | 0 |
| Hirst, Brooke and Hirst | 2 | - | 0 |
| Hirst, David | 0 | 5 | 0 |
| Hobbs, H. | 0 | 5 | 0 |
| Holmes, Francis | 0 | 5 | 0 |
| Holmes, J. | 0 | 10 | 6 |
| Horsfield, E. | 0 | 5 | 0 |
| Jefferson, P. | 0 | 10 | 6 |
| Metcalfe, H. T. | 0 | 10 | 6 |
| Pollitt, W. D. | 0 | 5 | 0 |
| Ratheram, W. | 0 | 5 | 0 |
| Reynolds, Richard | 1 | 1 | 0 |
| Reynolds, Richard F. | 0 | 10 | 6 |
| Robinson, W. | 0 | 5 | 0 |
| Saville, William | 0 | 5 | 0 |
| Smeeton, W. (Executors of) | 0 | 10 | 6 |
| Smith, R. H. | 0 | 2 | 6 |
| Taylor, Samuel | 1 | 1 | 0 |

### Leicester.

| | | | |
|---|---|---|---|
| Berridge, Alfred | 0 | 5 | 0 |
| Broof, R. | 0 | 10 | 6 |
| Burford, S. F. | 0 | 10 | 6 |
| Butler, J. A. | 0 | 2 | 6 |
| Butler, T. E. | 0 | 2 | 6 |
| Clark, John W. | 2 | 2 | 0 |
| Clark, Walter B. | 0 | 10 | 6 |
| Cleaver, Samuel | 0 | 5 | 0 |
| Cox, S. G. | 0 | 10 | 0 |
| Ellis, George | 0 | 5 | 0 |
| Esam, Richard | 0 | 10 | 6 |
| Harvey William R. | 1 | 1 | 0 |
| Hind, W. T. | 0 | 5 | 0 |
| Kelly, J. G. | 0 | 5 | 0 |
| Lloyd, T. H. | 1 | 1 | 0 |
| Meadows, J. | 0 | 7 | 0 |
| Ough, L. | 0 | 10 | 6 |
| Parry, J. | 0 | 5 | 0 |
| Pickering, Henry | 0 | 5 | 0 |
| Rowe, W. | 0 | 5 | 0 |
| Sharp, Edward K. | 0 | 5 | 0 |
| Thirlby, W. | 0 | 2 | 6 |
| Wand, Stephen | 0 | 10 | 6 |
| Woolley, G. J. B. | 0 | 10 | 0 |

### Leigh (Lancs.).

| | | | |
|---|---|---|---|
| Bennett, J. W. | 0 | 5 | 0 |

### Leighton Buzzard.

| | | | |
|---|---|---|---|
| Herington, H. E. | 0 | 5 | 0 |
| Richmond, R. | 1 | 1 | 0 |

### Leith.

| | | | |
|---|---|---|---|
| Baxter, A. K. | 0 | 2 | 6 |
| Blyth, J. | 0 | 2 | 6 |
| Coats, J. T. | 0 | 7 | 6 |
| Crichton, Alexander | 0 | 5 | 0 |
| Duncan, Flockhart Powell and Co. | 0 | 10 | 6 |
| McDougall, R. I. | 0 | 10 | 0 |
| Mair, Alexander | 0 | 5 | 0 |

### Lenton.

| | | | |
|---|---|---|---|
| Wilson, Thomas | 0 | 5 | 0 |

### Lenzie (N.B.).

| | | | |
|---|---|---|---|
| Pettigrew, J. W. | 0 | 4 | 0 |

### Leominster.

| | | | |
|---|---|---|---|
| Buckham, J. | 0 | 2 | 6 |
| Ellwood, M. J. | 0 | 5 | 0 |
| Sandiland, Robert B. | 0 | 10 | 6 |

### Lerwick.

| | | | |
|---|---|---|---|
| Laing, A. L. | 0 | 2 | 6 |
| Porteous, Arthur A. | 0 | 2 | 6 |

### Leven.

| | | | |
|---|---|---|---|
| Hogg, A. | 0 | 5 | 0 |

### Lewes.

| | | | |
|---|---|---|---|
| Briscoe, Charles (West Firle) | 0 | 5 | 0 |
| Head, John T. | 0 | 10 | 6 |
| Higham, F. | 0 | 5 | 0 |

### Leyton.

| | | | |
|---|---|---|---|
| Bulgin, W. | 0 | 5 | 0 |
| Freeman, J. | 0 | 2 | 6 |
| Yewen, C. H. J | 0 | 2 | 6 |

### Leytonstone.

| | | | |
|---|---|---|---|
| Bennett, C. | 0 | 5 | 0 |
| Cleland, A. H. | 0 | 2 | 0 |
| Matthews, J. H. | 0 | 5 | 0 |
| Wheeler, H. | 0 | 10 | 0 |

### Lincoln.

| | £ | s. | d. |
|---|---|---|---|
| Birbeck, J. T. | 0 | 5 | 0 |
| Button, A. E. | 0 | 5 | 0 |
| Elmitt, G. | 0 | 10 | 0 |
| Elmitt, W. | 0 | 5 | 0 |
| Harston, C. E. | 0 | 5 | 0 |
| Hill, W. E. | 0 | 5 | 0 |
| Houfe, R. W. | 0 | 5 | 0 |
| Hyett, H. | 0 | 10 | 6 |
| Maltby, J. | 0 | 10 | 6 |
| Rayner, H. | 0 | 5 | 0 |
| Scoley, T. E. | 0 | 10 | 6 |
| Wilmot, B. | 0 | 4 | 5 |

### Lindfield.

| | | | |
|---|---|---|---|
| Ferryman, H. | 0 | 5 | 0 |

### Litcham (Norfolk).

| | | | |
|---|---|---|---|
| White, W. | 0 | 5 | 0 |

### Littleborough.

| | | | |
|---|---|---|---|
| Hall, Samuel | 0 | 5 | 0 |

### Little Chishill.

| | | | |
|---|---|---|---|
| Jefferson, Thomas | 0 | 10 | 6 |

### Littlehampton.

| | | | |
|---|---|---|---|
| Longman, J. H. | 0 | 7 | 6 |
| Smart, C. F. | 1 | 1 | 0 |

### Liverpool.

| | | | |
|---|---|---|---|
| Abraham, Alfred Clay | 1 | 1 | 0 |
| Abraham, Thomas Fell | 1 | 1 | 0 |
| Adams, Thomas E. | 0 | 10 | 6 |
| Adams, T. E., jun. | 0 | 5 | 0 |
| Albright, Henry | 0 | 10 | 6 |
| Alexander, John | 0 | 10 | 6 |
| Allan, James H. | 1 | 1 | 0 |
| Aris, G. H. | 0 | 2 | 6 |
| Ayrton and Saunders | 0 | 10 | 6 |
| Bain, John | 0 | 10 | 6 |
| Billington, F. | 0 | 5 | 0 |
| Blabey, J. J. (Woolton) | 1 | 1 | 0 |
| Blabey, J. R. (Woolton) | 0 | 5 | 0 |
| Blood, C. (Waterloo) | 0 | 5 | 0 |
| Brown, Edwin | 0 | 5 | 0 |
| Brown, Joseph | 0 | 2 | 6 |
| Buck, A. S. | 0 | 5 | 0 |
| Burn, J. R. | 0 | 2 | 6 |
| Burnet, G. M. | 0 | 5 | 0 |
| Clay, Dod and Co. | 1 | 1 | 0 |
| Clubb, W. H. | 0 | 5 | 0 |
| Coley, James | 0 | 5 | 0 |
| Cowley, R. C. | 0 | 5 | 0 |
| Dickins, B. | 0 | 10 | 6 |
| Drawbridge, Joseph G. | 0 | 10 | 6 |
| Drawbridge, T. F. | 0 | 2 | 6 |
| Drew, S. K. | 0 | 5 | 0 |
| Ellams, George | 0 | 10 | 0 |
| Elliott, Robert John | 0 | 10 | 6 |
| Evans, Sons and Co. | 5 | 5 | 0 |
| Fergusson, W. and J. | 1 | 1 | 0 |
| Findlay, J. | 0 | 5 | 0 |
| Furniss, Thomas | 0 | 5 | 0 |
| Hackett, Thomas | 0 | 10 | 0 |
| Hawood, Charles | 0 | 5 | 0 |
| Hocken, Joshua | 0 | 10 | 6 |
| Hodges, E. G. | 0 | 5 | 0 |
| Hudson, T. H. | 0 | 2 | 6 |
| Jackson, H. | 0 | 10 | 6 |
| Johnson, J. H. and S. | 2 | 2 | 0 |
| Jones, John | 0 | 5 | 0 |
| Jordan, J. A. | 0 | 5 | 0 |
| Kirk, W. P. | 0 | 5 | 0 |
| Leatham, W. H. | 0 | 10 | 0 |
| Lee, Samuel W. | 1 | 1 | 6 |
| Lett, Arthur J. | 0 | 5 | 0 |
| McGuffie and Co. | 2 | 2 | 0 |
| MacKinlay, F. J. | 1 | 1 | 0 |
| Mitchell, R. H. | 0 | 2 | 6 |
| Morgan, H. B. | 0 | 10 | 0 |
| Parkinson, Richard | 0 | 10 | 6 |
| Partridge, T. S. | 0 | 2 | 6 |
| Parry, R. | 0 | 5 | 0 |
| Pearce, J. H. | 0 | 2 | 6 |
| Richardson, J. W. | 0 | 5 | 0 |
| Richardson, Richard T. | 0 | 10 | 6 |
| Ridgway, T. E. | 0 | 5 | 0 |
| Sawden, Alfred | 0 | 10 | 6 |
| Sleggs, G. M. | 0 | 5 | 0 |
| Smith, J. (Aigburth) | 0 | 10 | 6 |
| Smith, J. J. (Walton) | 0 | 10 | 6 |
| Smith, R. G. | 0 | 5 | 0 |
| Sumner, R. and Co. | 1 | 1 | 0 |
| Swinton, T. H. | 0 | 5 | 0 |
| Symes, Charles | 2 | 2 | 0 |
| Thomas, Robert | 0 | 10 | 6 |

### Liverpool—continued.

| | £ | s. | d. |
|---|---|---|---|
| Thompson, John | 1 | 1 | 0 |
| Thompson and Capper | 1 | 1 | 0 |
| Tollitt, W. | 0 | 2 | 6 |
| Warhurst, Mrs. A. (Executors of late) | 2 | 2 | 0 |
| Williams, William | 0 | 5 | 0 |
| Wokes, T. S. | 0 | 5 | 0 |
| Woodhead, H. C. | 0 | 10 | 6 |
| Wright, William | 0 | 5 | 0 |
| Wyatt, H. | 0 | 5 | 0 |
| Wyatt, H., jun. | 0 | 5 | 0 |
| Yeats, T. F. | 0 | 10 | 0 |

### Liversèdge.

| | | | |
|---|---|---|---|
| Midwood, E. | 0 | 5 | 0 |

### Llanboidy.

| | | | |
|---|---|---|---|
| Walton, J. L. | 0 | 6 | 6 |

### Llanbyther.

| | | | |
|---|---|---|---|
| Jones, J. E. | 0 | 2 | 6 |

### Llandilo.

| | | | |
|---|---|---|---|
| Hughes, T. | 1 | 1 | 0 |
| Williams, W. J. | 0 | 2 | 6 |

### Llandudno.

| | | | |
|---|---|---|---|
| Burton, Joseph | 1 | 1 | 0 |
| Pierce, R. W. C. | 0 | 5 | 0 |
| Sinclair, Mrs. M. A. | 0 | 10 | 6 |

### Llanelly.

| | | | |
|---|---|---|---|
| Evans, Gwilym | 1 | 1 | 0 |
| Jones, J. W. | 0 | 5 | 0 |
| Wade, J. | 0 | 2 | 6 |

### Llangollen.

| | | | |
|---|---|---|---|
| Jones, Humphrey | 0 | 5 | 0 |

### Llanidloes.

| | | | |
|---|---|---|---|
| Jones, Thomas Pryce | 0 | 2 | 6 |

### Llanrwst.

| | | | |
|---|---|---|---|
| Jones, O. | 0 | 2 | 6 |

### Loanhead.

| | | | |
|---|---|---|---|
| Stephen, J. | 0 | 5 | 0 |

### Lochgeily.

| | | | |
|---|---|---|---|
| Graham. A. | 0 | 5 | 0 |

### Loddon.

| | | | |
|---|---|---|---|
| Ellis, T. W. | 0 | 10 | 6 |

### London.

| | | | |
|---|---|---|---|
| Adams, J. | 0 | 5 | 0 |
| Allen, Charles B. | 2 | 2 | 0 |
| Allgood, E. J. | 0 | 5 | 0 |
| Amoore, Lewis P. | 0 | 10 | 6 |
| Andrew, C. W. | 0 | 2 | 6 |
| Andrews, D. F. | 0 | 5 | 0 |
| Andrews, Frederick | 0 | 10 | 6 |
| Applegate, Edwin | 0 | 10 | 6 |
| Arkinstall, William | 1 | 1 | 0 |
| Ashford, H. S. | 0 | 5 | 0 |
| Atkinson, James | 0 | 5 | 0 |
| Atkinson, L. | 1 | 1 | 0 |
| Aukland, W. H. | 0 | 2 | 6 |
| Austin, Henry Felix | 1 | 1 | 0 |
| Babb, J. | 0 | 10 | 6 |
| Bacon, Henry J. | 0 | 2 | 6 |
| Baines, Wm. H. | 0 | 10 | 6 |
| Baker, A. D. | 0 | 2 | 6 |
| Baker, Alfred P. | 0 | 10 | 6 |
| Baker, P. C. | 0 | 5 | 0 |
| Ball, Junior Pharmacy | 12 | 12 | 0 |
| Ball, The Chemists', per Mr. H. A. Thomas | 21 | 0 | 0 |
| Barker, A. W. | 0 | 5 | 0 |
| Barlow, Dr. T. | 1 | 1 | 0 |
| Barnard, A. P. | 0 | 5 | 0 |
| Barnes, James Benjamin | 1 | 1 | 0 |
| Barnes, James Burden | 0 | 5 | 0 |
| Barret, Edward Louis | 1 | 1 | 0 |
| Barry, Frederic | 0 | 5 | 0 |
| Bartlett, G. F. H. | 0 | 5 | 0 |
| Bartley, George A. | 0 | 10 | 6 |
| Bascombe, Frederick | 0 | 10 | 6 |
| Bate, Henry | 1 | 1 | 0 |
| Bateman, T. H. | 1 | 1 | 0 |
| Bathe, F. J. | 0 | 5 | 0 |
| Beale, W. S. | 0 | 5 | 0 |
| Beasley, Frederick | 0 | 5 | 0 |
| Beddard, John | 1 | 1 | 0 |
| Bedford, C. | 0 | 10 | 6 |
| Bell, Matthew W. | 1 | 1 | 0 |
| Bell, William H. | 1 | 1 | 0 |

### London—continued.

| | £ | s. | d. |
|---|---|---|---|
| Belton, E. K. | 0 | 2 | [illegible] |
| Bennett, Thomas | 0 | 5 | [illegible] |
| Benson, G. W. | 0 | 5 | [illegible] |
| Bessell, J. W. | 0 | 10 | [illegible] |
| Betts, C. E. O. | 0 | 10 | [illegible] |
| Bevan, William | 0 | 10 | [illegible] |
| Bigg, Thomas | 1 | 1 | [illegible] |
| Bindloss, G. F. | 0 | 10 | [illegible] |
| Bingley, Richard | 0 | 10 | [illegible] |
| Bird, Augustus | 4 | 4 | [illegible] |
| Bird, F. C. J. | 0 | 7 | [illegible] |
| Bird, G. | 1 | 1 | [illegible] |
| Bird, Robert | 0 | 10 | [illegible] |
| Blake, Charles A. | 1 | 1 | [illegible] |
| Bland, John | 0 | 10 | 6 |
| Blewett, E. | 0 | 5 | [illegible] |
| Bourdas, Isaiah | 1 | 1 | [illegible] |
| Bourdas, I., jun. | 0 | 10 | 6 |
| Bowdler, E. H. | 0 | 5 | 0 |
| Bowen, F. T. | 0 | 5 | 0 |
| Bowen, John W. | 1 | 1 | 0 |
| Brand and Co. | 1 | 1 | 0 |
| Branford, A. J. | 0 | 5 | 0 |
| Bray, G. T. | 0 | 5 | 0 |
| Briant, H. J. | 0 | 5 | 0 |
| Bridges, C. W. | 0 | 10 | 6 |
| Bright, F. | 0 | 5 | 0 |
| Broad, H. J. | 0 | 2 | 6 |
| Brodribb, J. B. | 0 | 10 | 6 |
| Brookes, Samuel | 0 | 10 | 6 |
| Brooks, J. | 0 | 2 | 6 |
| Broumpton, F. R. | 0 | 2 | 6 |
| Brown, Alfred James | 0 | 10 | 6 |
| Brown, E. A. | 0 | 5 | 0 |
| Brown, Edgar M. | 0 | 2 | 6 |
| Brown, J. | 0 | 5 | 0 |
| Brown, J. | 0 | 2 | 6 |
| Bull, E. John | 0 | 5 | 0 |
| Bullock, J. Lloyd and Co. | 2 | 2 | 0 |
| Bunker, C. J. G. | 0 | 5 | 6 |
| Bunker, James | 0 | 2 | 0 |
| Burden, C. H. B. | 0 | 5 | 0 |
| Burgoyne, Burbidges, Cyriax and Farries | 2 | 2 | 6 |
| Burleigh, W. M. | 0 | 10 | 0 |
| Burroughs, S. M. (Donation) | 100 | 0 | 0 |
| Burton, Percy H. | 0 | 5 | 0 |
| Butt, Edward Northway | 10 | 10 | 0 |
| Butterworth, John | 0 | 10 | 6 |
| Cadman, Daniel C. | 1 | 1 | 0 |
| Cammack, J. F. J. | 0 | 5 | 0 |
| Campbell, E. K. | 0 | 5 | 0 |
| "Camwall" Directors (Donation) | 50 | 0 | 0 |
| Canson, W. C. | 0 | 2 | 6 |
| Carpenter, J. E. | 0 | 2 | 6 |
| Carteighe, Michael | 1 | 1 | 0 |
| Casewell, J. P. | 0 | 5 | 0 |
| Chapman, F. G. | 0 | 5 | 0 |
| Chapman, Joseph J. | 0 | 10 | 6 |
| Chaston, G. H. | 0 | 2 | 6 |
| Chemists' Aerated & Mineral Waters Association (Donation) | 5 | 5 | 0 |
| *Chemist and Druggist* (Proprietors of) | 5 | 5 | 0 |
| Chemists' Assistants' Association | 1 | 10 | 0 |
| Christmas, W. G. | 0 | 5 | 0 |
| Churchyard, R. L. | 0 | 5 | 0 |
| Clapp, Edward F. | 0 | 10 | 0 |
| Clark, J. A. | 0 | 10 | 6 |
| Clarke, F. (Donation) | 10 | 10 | 0 |
| Clarke, W. L. | 0 | 5 | 0 |
| Clayton, T. | 0 | 5 | 0 |
| Clempson, J. | 0 | 5 | 0 |
| Clifford, T. A. | 0 | 2 | 6 |
| Cocker, H. | 0 | 2 | 6 |
| Cocker, R. B. | 0 | 2 | 6 |
| Colchester, William M. | 0 | 5 | 0 |
| Cole, A. C. | 1 | 1 | 0 |
| Coleman, J. | 0 | 5 | 0 |
| Coles, J. W. | 0 | 10 | 6 |
| Collett, Chas. B. | 0 | 5 | 0 |
| Collier, Henry | 0 | 10 | 6 |
| Constance, Edward | 0 | 10 | 6 |
| Constance, Herbert E. | 0 | 10 | 6 |
| Constance, Sidney W. | 1 | 1 | 0 |
| Cooper, Albert | 1 | 1 | 0 |
| Cooper, Henry | 0 | 10 | 6 |
| Cooper, H. H. | 1 | 1 | 0 |
| Cooper, W. | 0 | 2 | 6 |
| Cooper, W. W. R. | 3 | 3 | 0 |
| Cooper, Wm. Henry | 0 | 10 | 6 |
| Cooper, William Temple | 0 | 10 | 6 |
| Corbyn, Stacey and Co. | 2 | 2 | 0 |
| Cory, H. and Co. | 5 | 5 | 0 |
| Cosway, Edwin C. | 1 | 1 | 0 |
| Cottrill, John W. | 0 | 10 | 6 |

| London—continued. | £ | s. | d. |
|---|---|---|---|
| Cox, Oliver | 0 | 2 | 6 |
| Cracknell, Herbert | 1 | 1 | 0 |
| Cresswell, Frederick | 0 | 10 | 6 |
| Crosby, John | 0 | 2 | 6 |
| Crow, E. L. | 0 | 10 | 6 |
| Crowden, S. G. | 0 | 10 | 6 |
| Cryer, Henry | 0 | 5 | 0 |
| Cugnoni, A. H. D. | 0 | 5 | 0 |
| Cullen, Harry H. | 0 | 5 | 0 |
| Curtis and Co. | 1 | 1 | 0 |
| Curtis, G. | 0 | 10 | 0 |
| Dampney, Richard S. | 0 | 10 | 6 |
| Daniel, G. | 0 | 5 | 0 |
| Darby and Gosden | 2 | 2 | 0 |
| Dart, W. | 0 | 2 | 6 |
| Davenport, Horace | 2 | 2 | 0 |
| Davenport, J. T. | 2 | 2 | 0 |
| Davidson, P. | 1 | 1 | 0 |
| Davies, H. | 0 | 5 | 0 |
| Davis, F. | 0 | 2 | 6 |
| Davis, H. S. E. | 0 | 10 | 6 |
| Davy, Yates and Routledge | 2 | 2 | 0 |
| Day, J. A. | 0 | 5 | 0 |
| Dean, S. | 0 | 5 | 0 |
| De Peare, John Thomas | 0 | 5 | 0 |
| Dewar, Mrs. Mary Ann | 0 | 10 | 6 |
| Dinneford and Co. | 2 | 2 | 0 |
| Dixon, Herbert | 0 | 5 | 0 |
| Dodd, W. R. | 0 | 10 | 6 |
| Dolling, A. | 0 | 5 | 0 |
| Douglas, W. B. | 0 | 5 | 0 |
| Doulton and Co. | 1 | 1 | 0 |
| Drury, Sydney | 0 | 5 | 0 |
| Dunn, G. M. | 0 | 2 | 6 |
| Dunstan, J. F. | 0 | 2 | 6 |
| Durant, F. | 0 | 5 | 0 |
| Dymott, Francis | 0 | 5 | 0 |
| Dyson, A. | 0 | 5 | 0 |
| Dyson, William B. | 1 | 1 | 0 |
| Eade, George | 0 | 10 | 6 |
| Eade, James | 0 | 10 | 6 |
| Eastes, E. J. | 0 | 5 | 0 |
| Edgson, H. | 0 | 10 | 6 |
| Edwards, Charles | 1 | 1 | 0 |
| Edwards, James | 0 | 10 | 6 |
| Edwards, William Staples | 0 | 5 | 0 |
| Egg, G. F. | 0 | 10 | 6 |
| Elkington, W. A. | 0 | 5 | 0 |
| Ellerington, J. P. | 0 | 5 | 0 |
| Elliott, W. | 0 | 10 | 6 |
| Ellwood, T. A. | 0 | 5 | 0 |
| Elvey, the Misses | 1 | 1 | 0 |
| Emson, William N. | 0 | 5 | 0 |
| Epps, James | 1 | 1 | 0 |
| Evans, A. P. | 0 | 5 | 0 |
| Evans, D. W. | 0 | 2 | 6 |
| Evans, Lescher and Webb | 1 | 1 | 0 |
| Evershed, G. S. | 0 | 5 | 0 |
| Farmer, C. A. | 5 | 5 | 0 |
| Fawssett, T. | 0 | 5 | 0 |
| Fentiman & Co. | 2 | 0 | 0 |
| Fentiman, C. H. | 0 | 2 | 6 |
| Fentiman, Mrs. C. H. | 0 | 2 | 6 |
| Fillingham, J. | 0 | 10 | 0 |
| Fisher, G. R. | 0 | 5 | 0 |
| Fitch, Robert Owen | 0 | 10 | 6 |
| Foot, F. J. | 0 | 5 | 0 |
| Ford, W. C | 0 | 5 | 0 |
| Foster, E. W. | 0 | 2 | 6 |
| Fowle, S. | 1 | 1 | 0 |
| Fox, C. E. | 1 | 1 | 0 |
| Fox, W. R. | 1 | 1 | 0 |
| Francis, G. Bult | 1 | 1 | 0 |
| Francis, W. H. | 1 | 1 | 0 |
| Frayn, A. | 0 | 5 | 0 |
| Freeman, Frank | 0 | 5 | 0 |
| Freke, H. C. | 0 | 5 | 0 |
| Frith, E. J. | 0 | 5 | 0 |
| Froom, William Henry | 1 | 1 | 0 |
| Frost, John H. | 0 | 5 | 0 |
| Frost, W. T. | 0 | 10 | 6 |
| Fryer, C. H. | 0 | 10 | 6 |
| Furley, J. | 0 | 5 | 0 |
| Gadd, Robert | 1 | 1 | 0 |
| Garman, C. E. | 0 | 5 | 0 |
| Garner, Thomas | 0 | 5 | 0 |
| Garnham, A. W. | 0 | 5 | 0 |
| Gater, J. | 0 | 5 | 0 |
| Gilbart, S. F. | 0 | 2 | 6 |
| Glew, F. H. | 0 | 5 | 0 |
| Goddard, G. E. | 0 | 5 | 0 |
| Godfrey and Cooke | 1 | 1 | 0 |
| Godolphin, G. F. A. | 0 | 5 | 0 |
| Goff, Richard | 0 | 5 | 0 |
| Goldby, F. | 0 | 5 | 0 |
| Golding, J. F. | 1 | 1 | 0 |
| Goodall, W. A. | 0 | 10 | 6 |

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|---|---|---|---|
| Goodchild, Alfred C. | 0 | 5 | 0 |
| Goodwin, John | 1 | 1 | 0 |
| Gorton and Sons | 0 | 10 | 6 |
| Gradidge, James H. | 0 | 10 | 6 |
| Graham, Henry | 0 | 5 | 0 |
| Gravill, E. D. | 0 | 5 | 0 |
| Greaves, J. E. | 0 | 10 | 6 |
| Green, Samuel | 0 | 5 | 0 |
| Green, W. J. | 0 | 10 | 6 |
| Greenish, Professor | 0 | 10 | 0 |
| Greenish, Thomas | 1 | 1 | 0 |
| Greenish, T. Edward | 0 | 10 | 6 |
| Greig, W. | 0 | 2 | 6 |
| Gristock and Co. | 1 | 1 | 0 |
| Gudgen, Frederick G. | 1 | 1 | 0 |
| Gulliver, William | 1 | 1 | 0 |
| Gulliver, W. F. | 0 | 5 | 0 |
| Hairsine, H. S. | 1 | 1 | 0 |
| Hale, G. | 0 | 5 | 0 |
| Hall, A. W. | 0 | 10 | 6 |
| Hall, Ralph | 0 | 10 | 0 |
| Hampson, Robert | 1 | 1 | 0 |
| Hanbury, Cornelius | 1 | 1 | 0 |
| Hardy, Samuel C. | 1 | 1 | 0 |
| Harley, E. T. | 1 | 1 | 0 |
| ,, (Donation) | 5 | 5 | 0 |
| Harrington, J. F. | 0 | 10 | 6 |
| Harris, Frank William | 0 | 5 | 0 |
| Harris, G. | 0 | 10 | 6 |
| Hart, A. | 0 | 2 | 6 |
| Hart, J. C. | 0 | 5 | 0 |
| Hart, Thomas | 0 | 5 | 0 |
| Harvey, E. | 1 | 1 | 0 |
| Harvey, John William | 0 | 2 | 6 |
| Harvey, William | 0 | 10 | 6 |
| Hatfield, George B. | 0 | 10 | 6 |
| Hatfield, George W. | 0 | 10 | 6 |
| Havard, H. L. | 0 | 2 | 6 |
| Hawkins, Thomas | 0 | 10 | 6 |
| Hay, J. | 0 | 5 | 0 |
| Hayles, A. | 1 | 1 | 0 |
| Heale, A. O. T. | 0 | 2 | 6 |
| Hearn, John | 0 | 5 | 0 |
| Heath, F. D. | 0 | 5 | 0 |
| Hebbeler, K. | 0 | 10 | 6 |
| Henty, Henry Martin | 0 | 5 | 0 |
| Herbert, William | 0 | 5 | 0 |
| Hern, W. H. | 0 | 5 | 0 |
| Hewitt, J. R. | 0 | 5 | 0 |
| Hewlett, J. C. | 1 | 1 | 0 |
| Hick, John | 0 | 5 | 0 |
| Hickey, Evan Lewis | 0 | 10 | 6 |
| Hickman, William | 0 | 10 | 6 |
| Hicks, A. D. | 0 | 5 | 0 |
| Higgins, James | 0 | 10 | 6 |
| Hill, Arthur B. | 1 | 1 | 0 |
| Hill, Arthur S. | 2 | 2 | 0 |
| Hill, William | 0 | 5 | 0 |
| Hillen, John | 0 | 10 | 6 |
| Hills, Walter | 3 | 3 | 0 |
| Hiscox, W. R. | 0 | 2 | 0 |
| Hodgkinson, George A. | 0 | 10 | 6 |
| Hodgkinson (Thomas), Prestons and King | 2 | 2 | 0 |
| Hodgkinson, R. | 0 | 10 | 6 |
| Hodgkinson, Treacher and Clarke | 2 | 2 | 0 |
| Hodgson, J. D. | 0 | 2 | 6 |
| Hodsoll, Thomas W. H. | 1 | 1 | 0 |
| Hogg, E. G. | 0 | 10 | 6 |
| Hogg, Robert | 0 | 10 | 6 |
| Hogwood, E. | 1 | 1 | 0 |
| Hogwood, H. P. | 0 | 10 | 6 |
| Holding, J. | 0 | 5 | 0 |
| Holford, T. Constantine | 0 | 10 | 6 |
| Holl, E. | 0 | 5 | 0 |
| Holloway, J. | 0 | 2 | 6 |
| Holmes, A. J. | 0 | 10 | 6 |
| Holmes, Walter M. | 1 | 1 | 0 |
| Holroyd, W. H. | 0 | 10 | 6 |
| Hooper, W. H. | 0 | 5 | 0 |
| Hopkin and Williams | 2 | 2 | 0 |
| Hopkin, William King | 1 | 1 | 0 |
| Horrod, T. S. | 0 | 5 | 0 |
| Horsley, T. W. | 0 | 5 | 0 |
| Horton, H. W. | 0 | 5 | 0 |
| Howell, Maurice | 0 | 10 | 6 |
| Howlett, Samuel | 2 | 2 | 0 |
| Howse, W. F. | 0 | 5 | 0 |
| Hudson-Cox, F. | 0 | 5 | 0 |
| Hudson, T. F. | 0 | 5 | 0 |
| Hugill, John | 1 | 1 | 0 |
| Hugill, John H. | 1 | 1 | 0 |
| Humble, J. B. | 0 | 5 | 0 |
| Humphrey, John | 0 | 10 | 6 |
| Hunt, Charles | 1 | 1 | 0 |
| Huskisson, Henry Owen | 1 | 1 | 0 |
| Hutchins, E. C. | 0 | 2 | 6 |

| London—continued. |
|---|
| Hutton, T. W. |
| Hyde, F. W. |
| Hyne, Harry |
| Hyslop, John Cahill |
| Icke, Henry S. |
| Idris, T. H. W. |
| Ince, Joseph |
| Ingham, J. |
| Ingram and Royle |
| Jacks, D. R. |
| Jackson, Christopher |
| Jackson, J. P. |
| Jakson, John and Co. |
| Jenkins, Henry |
| Jenkins, Thomas |
| Jewell, J. E. |
| Jobson, T. |
| Johnson and Sons |
| Johnston, W. |
| Jones, Henry Stevens |
| Jones, John H. |
| Jones, Jonah |
| Jones, L. |
| Jones, T. P. |
| Jones, T. Y. |
| Jones, William |
| Jones, William |
| Jones, William |
| Jones, W. A. |
| Joseph, L. |
| Josling, A. |
| Jozeau, G. |
| Keer, Isabella S. Clarke |
| Keer, Thomas H. |
| Keith, A. R. |
| Kent, Thomas Ramsey |
| Kerr, T. |
| King, Henry |
| King, J. H. |
| King, T. W. |
| Kingan, D. |
| Kingsford, Frederick |
| Kirk, Snowden |
| Kitchin, J. |
| Laing, J. S. |
| Lane, H. C. G. |
| Langley, Frank C. |
| Lapthorn, G. |
| Lawrence, A. F. |
| Laws, John |
| Layng, R. C. |
| Legg, H. A. |
| Lester, J. F. |
| Lewinton, Alexander B. |
| Lidwell, J. E. |
| Littlejohn, A. |
| Llewhelin, Ivor V. |
| Lloyd, Isaac T. |
| Lloyd, J. H. |
| Lloyd, Mrs. S. |
| Lockyer, J. E. |
| Long, H. H. |
| Longstaff, W. L. |
| Lovibond, J. J. |
| Lowe, William E. |
| Lucas, E. W. |
| Lucas, J. M. M. |
| Luxmoore, C. M. |
| Lynn, J. R. |
| Lyon, James |
| Macdonald, Alexander |
| MacEwan, Peter |
| MacGeorge, William |
| McKnight, J. |
| Maish, J. R. |
| Maizey, E. |
| Makepeace, A. B. |
| Malcolm, J. |
| Marks (Henry) and Sons |
| Marsh, E. R. |
| Marsh, W. H. |
| Marston, John Thomas |
| Martin, G. H. |
| Martin, T. C. W. |
| Martin, W. J. |
| Martindale, William |
| Mathews, J. H. |
| Matterson, J. K. |
| Matthews, C. W. |
| Matthews, E. S. |
| Matthews, H. R. |
| Maw, Charles |
| Maw, C. Trentham |
| Maw, Son and Thompson |
| Maxwell, P. H. |
| Meacher, J. C. |
| Meggeson and Co. |

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|---|---|---|---|
| Michie, Charles C. | 0 | 5 | 0 |
| Miles, C. J. | 1 | 1 | 0 |
| Miller, W. P. F. | 0 | 5 | 0 |
| Millhouse, H. H. | 0 | 5 | 0 |
| Minshull, Flora | 0 | 5 | 0 |
| Minshull, Rose C. | 1 | 1 | 0 |
| Moore, J. | 0 | 5 | 0 |
| Morgan, H. | 1 | 1 | 0 |
| Morley, C. | 0 | 5 | 0 |
| Morrell Brothers, F. and C. | 0 | 5 | 0 |
| Morrell, Thomas | 0 | 5 | 0 |
| Morris, C. G. | 0 | 10 | 6 |
| Moss, John and Co. | 1 | 1 | 0 |
| Moxon, G. R. | 0 | 10 | 6 |
| Mundy, Alfred O. | 0 | 10 | 6 |
| Mutch, John Pratt | 0 | 5 | 0 |
| Myers, William | 0 | 10 | 6 |
| Naylor, W. A. H. | 0 | 10 | 6 |
| Neale, J. | 0 | 5 | 0 |
| Nettle, W. R. P. | 0 | 5 | 0 |
| Newhill, J. W. | 1 | 1 | 0 |
| Newton, A. | 0 | 10 | 6 |
| Newzam, Henry Samuel | 0 | 10 | 6 |
| Nicholls, T. | 1 | 1 | 0 |
| Nicholson, Thomas T. | 0 | 5 | 0 |
| Nind, George | 0 | 10 | 6 |
| Ninnis, T. M. | 0 | 5 | 0 |
| Nurthen, F. R. | 2 | 2 | 0 |
| Nurthen, Mrs. | 1 | 1 | 0 |
| Oakeley, T. J. | 0 | 2 | 6 |
| Ord, Septimus W. | 0 | 5 | 0 |
| Orry, J. G. | 0 | 2 | 6 |
| Page, R. S. | 0 | 5 | 0 |
| Parker, F. P. | 0 | 10 | 6 |
| Parker, Robert Henry | 1 | 1 | 0 |
| Parker, W. H. | 0 | 10 | 6 |
| Parkes, J. P. | 1 | 1 | 0 |
| Parkinson and Son | 1 | 1 | 0 |
| Parry, C. D. | 0 | 5 | 0 |
| Pasco, G. S. | 0 | 2 | 6 |
| Pasmore, W. F. | 0 | 5 | 0 |
| Patey, W. J. | 0 | 7 | 6 |
| Pattison, George | 1 | 1 | 0 |
| Payne, W. | 0 | 5 | 0 |
| Peacock, George | 0 | 5 | 0 |
| Peat, Joseph | 0 | 5 | 0 |
| Peel, Alfred | 0 | 10 | 6 |
| Peers, W. | 0 | 2 | 6 |
| Pellew, A. | 0 | 10 | 6 |
| Penrose, A. W. | 1 | 1 | 0 |
| Peters, D. | 0 | 5 | 0 |
| Pettinger, Elmer | 0 | 5 | 0 |
| Pharmacy Club (per Richard Bremridge, Hon. Sec.) | 10 | 10 | 0 |
| Phillips, A. J. | 0 | 10 | 6 |
| Phillips, A. W. | 0 | 5 | 0 |
| Phillips, Mrs. A. | 0 | 10 | 6 |
| Philpott, F. W. | 0 | 5 | 0 |
| Pickard, William | 2 | 2 | 0 |
| Pinchen, W. J. | 1 | 1 | 0 |
| Pinyon, William | 0 | 10 | 6 |
| Plaister, W. J. | 1 | 1 | 0 |
| Playford, F. W. | 0 | 5 | 0 |
| Plowright, J. | 0 | 5 | 0 |
| Pond, B. C. | 0 | 5 | 0 |
| Pond, G. P. | 0 | 10 | 6 |
| Ponting, F. H. | 0 | 5 | 0 |
| Portway, A. C. | 0 | 5 | 0 |
| Portway, J. B. | 0 | 10 | 6 |
| Potter, H. (Donation) | 5 | 5 | 0 |
| Potts, Robert A. | 1 | 1 | 0 |
| Potts, R. | 0 | 5 | 0 |
| Poulson, E. | 1 | 1 | 0 |
| Pound, H. W. | 1 | 1 | 0 |
| Powell and Sons | 1 | 1 | 0 |
| Powell, S. R. | 0 | 10 | 6 |
| Powell, T. H. | 1 | 1 | 0 |
| Prentice, H. V. | 0 | 2 | 6 |
| Presbury, H. H. | 0 | 5 | 0 |
| Pretty, Charles | 0 | 5 | 0 |
| Price, J. T. | 0 | 2 | 6 |
| Price, Robert John | 0 | 5 | 0 |
| Prichard, Edward | 1 | 1 | 0 |
| Probyn, P. Clifford (donation) | 10 | 10 | 0 |
| Procter, H. R. | 0 | 5 | 0 |
| Procter, R. | 0 | 5 | 0 |
| Puckey, W. | 0 | 10 | 6 |
| Pursey, G. F. | 0 | 2 | 6 |
| Radermacher, C. J. | 0 | 10 | 6 |
| Rae, A. D. | 1 | 1 | 0 |
| Reaney, Mrs. G. S. | 1 | 1 | 0 |
| Reed, Charles W. | 0 | 10 | 6 |
| Rees-Williams, J. J. | 0 | 5 | 0 |
| Reynolds, R. J. | 1 | 1 | 0 |
| Richardson, John | 0 | 5 | 0 |
| Riches, F. F. | 0 | 5 | 0 |

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|---|---|---|---|
| Rigden, George | 0 | 5 | 0 |
| Roach, H. W. | 1 | 1 | 0 |
| Roach, Pope | 1 | 1 | 0 |
| Roberts, F. L. | 0 | 2 | 6 |
| Roberts, H. W. | 0 | 2 | 6 |
| Roberts, R. | 0 | 10 | 6 |
| Roberts, W. | 0 | 2 | 6 |
| Robertson, George | 0 | 10 | 6 |
| Robeson, C. B. | 0 | 5 | 0 |
| Robinson, C. E. | 0 | 5 | 0 |
| Robinson, R. A. | 0 | 10 | 6 |
| Robinson, William P. | 0 | 10 | 6 |
| Ross, C. | 0 | 5 | 0 |
| Rowden, L. | 0 | 5 | 0 |
| Rowland, E. E. | 0 | 10 | 6 |
| Rowntree, Thomas | 0 | 10 | 6 |
| Rundle, C. | 0 | 5 | 0 |
| Rutter, John | 0 | 10 | 0 |
| Sadler, William | 0 | 10 | 6 |
| Sadler, William, jun. | 0 | 10 | 6 |
| Sainsbury, S. | 1 | 1 | 0 |
| Sandy, Frederick William | 0 | 10 | 6 |
| Sanford, H. R. | 0 | 5 | 0 |
| Sanger and Sons | 2 | 2 | 0 |
| Sangster, Arthur | 1 | 1 | 0 |
| Saul, J. E. | 1 | 1 | 0 |
| Saunders, C. | 0 | 10 | 6 |
| Savory and Moore | 3 | 3 | 0 |
| Sayers, W. J. | 1 | 1 | 0 |
| Sedcole, J. W. | 0 | 10 | 6 |
| Seldon, R. | 0 | 2 | 6 |
| Sell, W. H. | 0 | 10 | 6 |
| Sewell, T. A. W. | 0 | 5 | 0 |
| Seymour, W. H. | 0 | 2 | 6 |
| Sharman, Wm. | 0 | 10 | 0 |
| Shaw, E. H. | 0 | 2 | 6 |
| Shaw, J. W. | 0 | 10 | 6 |
| Shephard, Thomas F. | 0 | 10 | 6 |
| Shepley, Frederick Thos. | 0 | 5 | 0 |
| Shera, W. A. | 0 | 2 | 6 |
| Sherburn, Thomas | 0 | 10 | 6 |
| Sherwood, N. | 0 | 10 | 6 |
| Shields, R. H. | 0 | 5 | 0 |
| Shirley, S. S. | 1 | 1 | 0 |
| Sibthorp, S. J. K. | 0 | 2 | 6 |
| Silverlock, Henry | 5 | 5 | 0 |
| Silvers, Francis T. | 0 | 10 | 6 |
| Sisson, E. | 0 | 5 | 0 |
| Slack, Josiah W. | 0 | 10 | 6 |
| Slator, Henry | 0 | 5 | 0 |
| Smart, W. | 0 | 10 | 6 |
| Smith, Albert | 0 | 5 | 0 |
| Smith, Fuller | 0 | 10 | 6 |
| Smith, J. | 0 | 2 | 6 |
| Smith, J. B. | 0 | 5 | 0 |
| Smith, James W. | 0 | 10 | 6 |
| Smith, John Ord | 1 | 1 | 0 |
| Smith, Percy John | 1 | 1 | 0 |
| Smith, R. S. | 0 | 5 | 0 |
| Smith, William | 0 | 10 | 6 |
| Smith, William Frederick | 1 | 1 | 0 |
| Smith, William L. | 0 | 10 | 6 |
| Snell, C. H. | 0 | 10 | 6 |
| Snow, G. F. | 0 | 2 | 6 |
| Spearing, A. J. | 0 | 5 | 0 |
| Spurling, W. | 0 | 10 | 6 |
| Spyer, Newton | 0 | 10 | 6 |
| Squire and Sons | 3 | 3 | 0 |
| Squire, T. | 0 | 5 | 0 |
| Stalford, D. | 0 | 2 | 6 |
| Stamp, Edward B. | 0 | 10 | 6 |
| Stansfield, Richard | 0 | 5 | 0 |
| Stark, A. C. | 0 | 5 | 0 |
| Starkey, E. B. | 0 | 5 | 0 |
| Starkie, Richard S. | 1 | 1 | 0 |
| Stephens, Henry I. | 0 | 5 | 0 |
| Stickland, W. H. | 1 | 1 | 0 |
| Stone, J. J. | 0 | 10 | 6 |
| Stoneham, Philip | 0 | 10 | 6 |
| Storey, E. H. | 1 | 1 | 0 |
| Stratton, A. R. | 0 | 2 | 6 |
| Stratton, William | 0 | 2 | 6 |
| Streater, James H. | 0 | 10 | 6 |
| Strongitharm, W. G. | 0 | 5 | 0 |
| Strother, Florence E. | 0 | 2 | 6 |
| Style, J. W. | 0 | 10 | 6 |
| Sugden, W. A. | 1 | 1 | 0 |
| Summers, James R. | 0 | 10 | 6 |
| Sursham, F. T. | 0 | 5 | 0 |
| Symons, William H. | 1 | 1 | 0 |
| Taplin, J. W. | 0 | 10 | 6 |
| Taplin, William Gilbert | 1 | 1 | 0 |
| Taubman, Robert | 0 | 10 | 6 |
| Taylor, E. | 0 | 2 | 6 |
| Taylor, George S. | 1 | 1 | 0 |
| Taylor, Horatio | 0 | 10 | 6 |

| London—continued. | £ | s. | d. |
|---|---|---|---|
| Taylor, John | 0 | 10 | 6 |
| Taylor, Peter | 0 | 5 | 0 |
| Tebbutt, Edwin | 1 | 1 | 0 |
| Tennent, A. | 0 | 5 | 0 |
| Thatcher, R. | 0 | 5 | 0 |
| Thomas, H. | 1 | 1 | 0 |
| Thomas, Harry A. | 3 | 3 | 0 |
| Thomas, J. O. | 0 | 2 | 6 |
| Thomas, R. | 0 | 10 | 0 |
| Thompson, A. | 0 | 10 | 6 |
| Thompson, Arthur S. | 0 | 5 | 0 |
| Thompson, Henry | 0 | 10 | 6 |
| Thompson, Henry Ayscough | 1 | 1 | 0 |
| Thompson, John | 1 | 1 | 0 |
| Thompson, R. W. | 0 | 5 | 0 |
| Thompson, T. | 0 | 2 | 6 |
| Thorn, John James | 1 | 1 | 0 |
| Thornton, L. B. | 0 | 5 | 0 |
| Tijou, Tom | 0 | 5 | 0 |
| Tingle, Miss Ellen | 0 | 2 | 6 |
| Tomlinson, Thomas | 1 | 1 | 0 |
| Tompsett, Leighton S. | 0 | 5 | 0 |
| Treaddell, E. J. | 0 | 2 | 6 |
| Trick, William B. | 0 | 10 | 6 |
| Trotman, Alfred C. | 0 | 10 | 6 |
| Truman, F. W. | 0 | 10 | 6 |
| Truman, H. V. | 0 | 10 | 6 |
| Tucker, W. C. | 0 | 2 | 6 |
| Tugwell, Ernest H. | 0 | 10 | 6 |
| Tugwell, William H. | 0 | 10 | 6 |
| Tupholme, F. | 1 | 1 | 0 |
| Turner, Charles E. | 0 | 10 | 6 |
| Turner, Edward A. | 2 | 2 | 0 |
| Turner, Thomas | 0 | 5 | 0 |
| Tustin, Chas. D. | 5 | 5 | 0 |
| Upjohn, F. W. | 0 | 5 | 0 |
| Vaughan, J. | 0 | 2 | 6 |
| Vialls, J. B. | 1 | 1 | 0 |
| Vincent, P. | 2 | 2 | 0 |
| Vooght, W. J. | 0 | 5 | 0 |
| Walker, Charles | 0 | 5 | 0 |
| Walker, C. J. | 0 | 10 | 6 |
| Wallas, T. J. | 0 | 5 | 0 |
| Wallbridge, H. A. | 0 | 5 | 0 |
| Wallis, John T. W. | 0 | 10 | 6 |
| Wallis, Owen | 0 | 10 | 6 |
| Wallis, T. E. | 0 | 5 | 0 |
| Walton, F. M. | 0 | 5 | 0 |
| Want, W. P. | 0 | 5 | 0 |
| Warren, F. W. | 0 | 10 | 6 |
| Warren, William | 1 | 1 | 0 |
| Warrick Brothers | 1 | 1 | 0 |
| Wastie, Francis | 1 | 1 | 0 |
| Watson, A. J. | 0 | 10 | 6 |
| Watson, E. | 0 | 5 | 0 |
| Watson, E. J. | 0 | 5 | 0 |
| Watson, J. | 0 | 1 | 0 |
| Watson, William | 0 | 10 | 6 |
| Watts, Edward | 0 | 5 | 0 |
| Watts, J. M. | 0 | 10 | 6 |
| Wavell, Edward | 1 | 1 | 0 |
| Wegg, W. N. | 0 | 5 | 0 |
| Wells, W. | 0 | 5 | 0 |
| West, Charles | 0 | 10 | 6 |
| Weston, Samuel John | 1 | 1 | 0 |
| Westrup, Joseph B. | 0 | 10 | 6 |
| Whiffen, Thomas | 5 | 5 | 0 |
| Whigham, Robert L. | 0 | 5 | 0 |
| White, Charles | 1 | 1 | 0 |
| Widgery, John | 0 | 5 | 0 |
| Wiggins, Henry | 0 | 10 | 6 |
| Wigginton, Alfred | 0 | 10 | 6 |
| Wilkinson, Benjamin John | 0 | 10 | 6 |
| Wilkinson, W. | 0 | 2 | 6 |
| Wilkinson, W. | 0 | 5 | 0 |
| Will, William W. | 0 | 5 | 0 |
| Williams, Alfred | 0 | 10 | 6 |
| Williams, Henry | 2 | 2 | 0 |
| Williams, J. | 0 | 5 | 0 |
| Williams, J. W. | 1 | 1 | 0 |
| Williams, Stephen | 0 | 5 | 0 |
| Williams, T. R. | 0 | 5 | 0 |
| Williamson, J. C. | 0 | 5 | 0 |
| Willows, Francis and Butler | 3 | 3 | 0 |
| Wilson, James | 1 | 1 | 0 |
| Wilson, John | 0 | 5 | 0 |
| Wilson, J. F. | 0 | 5 | 0 |
| Wilson, W. | 0 | 5 | 0 |
| Wing, A. J. | 0 | 5 | 0 |
| Wink, J. A. | 1 | 1 | 0 |
| Wisken, Robert | 0 | 5 | 0 |
| Wodderspoon and Co. | 1 | 1 | 0 |
| Wood, Jacob | 1 | 1 | 0 |
| Wood, W. | 0 | 2 |  |
| Woollings, Frank | 0 | 2 | 6 |
| Wooster, J. R. | 1 | 1 | 0 |

### London—continued.

| | £ | s. | d. |
|---|---|---|---|
| Wootton, Alfred C. | 2 | 2 | 0 |
| Worsley, A. G. | 0 | 5 | 0 |
| Wretts, J. R. | 1 | 1 | 0 |
| Wright, Layman and Umney | 2 | 2 | 0 |
| Wyatt, Francis J. | 0 | 5 | 0 |
| Wybrant, A. | 0 | 5 | 0 |
| Wylde, George | 0 | 10 | 6 |
| Yates, Robert | 1 | 1 | 0 |
| Yeatman, F. J. | 0 | 2 | 6 |
| Young, George | 0 | 5 | 0 |
| Young, S. | 0 | 2 | 6 |
| Zusman, H. | 0 | 10 | 0 |

### Long Bennington.

| | | | |
|---|---|---|---|
| Bemrose, John | 0 | 10 | 6 |
| Drabble, T. L. | 0 | 5 | 0 |

### Longton.

| | | | |
|---|---|---|---|
| Hemming, G. T. | 0 | 5 | 0 |
| Prince, Arthur G. | 0 | 10 | 0 |
| Prince, R. | 0 | 5 | 0 |

### Looe (Cornwall).

| | | | |
|---|---|---|---|
| Poad, John | 0 | 2 | 6 |

### Lossiemouth.

| | | | |
|---|---|---|---|
| Bremner, James | 0 | 5 | 0 |

### Loughborough.

| | | | |
|---|---|---|---|
| Baldwin, G. J. | 0 | 2 | 6 |
| Charles, W. F. | 0 | 5 | 0 |
| Hepworth, J. S. | 0 | 5 | 0 |
| Jones, C. | 0 | 2 | 6 |

### Loughton.

| | | | |
|---|---|---|---|
| Harrison, J. | 0 | 10 | 0 |

### Louth.

| | | | |
|---|---|---|---|
| Dennis, J. W. and Son | 0 | 10 | 6 |
| Street, W. C. | 0 | 2 | 6 |

### Lowestoft.

| | | | |
|---|---|---|---|
| Beckett, E. J. | 0 | 2 | 6 |
| Chaston, Anna Maria | 0 | 10 | 6 |
| Hornby, Alfred | 0 | 10 | 6 |
| Moverley, Robert | 0 | 10 | 6 |
| Roberts, W. | 0 | 2 | 6 |

### Lucknow (India).

| | | | |
|---|---|---|---|
| Kidd, W. C. | 0 | 3 | 0 |

### Ludlow.

| | | | |
|---|---|---|---|
| Marston, Alfred | 0 | 5 | 0 |
| Nickson, James | 0 | 5 | 0 |
| Smith, F. W. | 0 | 2 | 6 |
| Woodhouse, George | 0 | 5 | 0 |

### Luton.

| | | | |
|---|---|---|---|
| Chantler, R. P. | 0 | 5 | 0 |
| Duberly, G. S. | 0 | 5 | 0 |
| Webb, John H. | 0 | 5 | 0 |

### Lydney (Glos.)

| | | | |
|---|---|---|---|
| Turner, H. P. | 0 | 4 | 0 |

### Lutterworth.

| | | | |
|---|---|---|---|
| Brown, Thomas | 0 | 10 | 6 |

### Lyme Regis.

| | | | |
|---|---|---|---|
| Henley, George | 0 | 5 | 0 |

### Lymington.

| | | | |
|---|---|---|---|
| Allen, Adam U. | 0 | 5 | 0 |
| Badcock, Henry | 0 | 5 | 0 |
| Covill, A. | 0 | 5 | 0 |

### Lymm.

| | | | |
|---|---|---|---|
| Henshall, James | 0 | 5 | 0 |

### Lytham.

| | | | |
|---|---|---|---|
| Gourlay, H. H. | 0 | 5 | 0 |

### Macclesfield.

| | | | |
|---|---|---|---|
| Cooper, Thomas | 0 | 5 | 0 |
| Hodkinson, J. | 0 | 5 | 0 |
| Johnson, H. M. | 0 | 2 | 6 |
| Leach, I. | 0 | 2 | 6 |
| Wood and Pass | 0 | 10 | 6 |
| Woodyatt, R. | 0 | 2 | 6 |
| Wright, J. | 0 | 5 | 0 |

### Maidenhead.

| | | | |
|---|---|---|---|
| Barry, Thomas S. | 0 | 10 | 6 |
| Cottingham, Joseph J. | 0 | 5 | 0 |
| Eggleton, B. | 0 | 10 | 6 |
| Walton, Ralph | 0 | 10 | 6 |
| Wardle, J. | 0 | 10 | 0 |

### Maidstone.

| | £ | s. | d. |
|---|---|---|---|
| Anning, A. | 0 | 5 | 0 |
| Chesterfield, T. M. | 0 | 5 | 0 |
| Corfe, Alfred | 0 | 5 | 0 |
| Rogers, William | 0 | 5 | 0 |
| Stonham, Thomas G. | 0 | 10 | 6 |

### Maldon (Essex).

| | | | |
|---|---|---|---|
| Crick, George E. | 0 | 10 | 6 |
| Heaver, A. W. | 0 | 5 | 0 |

### Malton (Yorks).

| | | | |
|---|---|---|---|
| Buckle, James | 0 | 5 | 0 |
| Harrison, William | 0 | 10 | 6 |
| Laverack, W. H. | 0 | 5 | 0 |

### Malvern.

| | | | |
|---|---|---|---|
| Andrews, J. H. | 0 | 5 | 0 |
| Austin, A. | 0 | 10 | 6 |
| Clark, H. B. | 0 | 2 | 6 |
| Clark, Mrs. J. | 0 | 2 | 6 |
| Coldwell, David B. | 0 | 10 | 6 |
| Fox, T. | 0 | 5 | 0 |
| Need, J. | 0 | 10 | 6 |

### Malvern Wells.

| | | | |
|---|---|---|---|
| Clark, Edward J. | 0 | 5 | 0 |

### Manchester.

| | | | |
|---|---|---|---|
| Arrandale, J. S. | 0 | 2 | 6 |
| Balmforth, A. | 1 | 1 | 0 |
| Rardsley, R. | 2 | 2 | 0 |
| Barford, H. W. | 0 | 5 | 0 |
| Bates, Frederic W. | 0 | 5 | 0 |
| Bayliss, T. G. | 0 | 2 | 6 |
| Beard, J. | 0 | 10 | 6 |
| Bell, James | 0 | 2 | 6 |
| Bell, Joseph | 0 | 5 | 0 |
| Benger, F. Baden | 1 | 1 | 0 |
| Bew, John | 1 | 1 | 0 |
| Billington, John | 0 | 5 | 0 |
| Blain, Alfred L. | 0 | 5 | 0 |
| Blyton, John | 0 | 10 | 6 |
| Boor, Frederick | 0 | 10 | 6 |
| Booth, T. | 0 | 2 | 6 |
| Botham, J. | 0 | 10 | 0 |
| Bowker, W. | 1 | 1 | 0 |
| Bawlas, D. | 0 | 2 | 6 |
| Bransby, C. K. | 0 | 2 | 6 |
| Breadner, C. G. | 1 | 1 | 0 |
| Brooks, Joseph | 1 | 1 | 0 |
| Broughton, T. | 0 | 2 | 6 |
| Bushby, Thomas | 0 | 5 | 0 |
| Cargill, D. A. | 0 | 2 | 6 |
| Carter, William | 0 | 10 | 6 |
| Clayton, G. | 0 | 5 | 0 |
| Cockshott, J. | 0 | 2 | 6 |
| Cowpe, M. | 0 | 2 | 6 |
| Darling, William | 1 | 1 | 0 |
| Dawson, Robert D. | 0 | 5 | 0 |
| Eden, W. J. | 0 | 2 | 6 |
| Edwards, G. | 0 | 5 | 0 |
| Fairweather, W. E. | 0 | 2 | 6 |
| Fawcitt, T. C. | 0 | 5 | 0 |
| Foden, E. | 0 | 5 | 0 |
| Fox, M. H. | 0 | 2 | 6 |
| Garner, E. J. F. | 0 | 5 | 0 |
| Gavin, J. | 0 | 5 | 0 |
| Gavin, T. | 0 | 5 | 0 |
| Gibbons, Walter | 0 | 10 | 6 |
| Gibson, Robert | 1 | 1 | 0 |
| Gourlay, R. G. | 0 | 2 | 6 |
| Hankinson, W. | 0 | 2 | 6 |
| Harding, E. | 0 | 10 | 6 |
| Hargrave, S. | 0 | 5 | 0 |
| Hedley, J. | 0 | 2 | 6 |
| Hilditch, Thomas | 0 | 5 | 0 |
| Holt, G. A. | 0 | 10 | 6 |
| Holt, H. C. | 0 | 5 | 0 |
| Holt, John | 0 | 5 | 0 |
| Hughes, Evan G. | 0 | 10 | 0 |
| Hughes, J. | 0 | 2 | 6 |
| Jacklin, A. | 0 | 5 | 0 |
| Jackson, George | 1 | 1 | 0 |
| Jackson, Thomas | 0 | 10 | 6 |
| Jeans, Alfred | 0 | 5 | 0 |
| Jeans, E. | 0 | 10 | 0 |
| Johnstone, E. S. | 0 | 5 | 0 |
| Kemp, Harry | 0 | 10 | 6 |
| Ker, A. | 0 | 5 | 0 |
| Kirkby, W. | 0 | 5 | 0 |
| Lane, W. | 1 | 1 | 0 |
| Leech, Robert | 0 | 5 | 0 |
| Marsden, Thomas B. (Withington) | 0 | 10 | 6 |
| Marsden, W. | 0 | 5 | 0 |
| Massey, J. | 0 | 2 | 6 |

### Manchester—continued.

| | £ | s. | d. |
|---|---|---|---|
| Morris, J. L. | 0 | 5 | 0 |
| Mundey, H. | 0 | 5 | 0 |
| Ogden, A. | 0 | 2 | 6 |
| Oliver, A. | 0 | 2 | 6 |
| Paine, Standen | 1 | 1 | 0 |
| Pickup, Robert L. | 0 | 10 | 0 |
| Pidd, Arthur J. | 0 | 10 | 6 |
| Pigott, Samuel | 0 | 2 | 6 |
| Powell, W. G. (Rusholme) | 0 | 2 | 6 |
| Pratt, G. W. | 0 | 5 | 0 |
| Redhead, J. | 0 | 2 | 6 |
| Rhodes, A. B. | 0 | 5 | 0 |
| Riding, J. | 0 | 5 | 0 |
| Ritchie, T. | 0 | 2 | 6 |
| Roberts, W. R. (Rusholme) | 0 | 5 | 0 |
| Sanders, E. | 0 | 2 | 6 |
| Sanderson, G. C. | 0 | 5 | 0 |
| Scaife, Samuel | 0 | 10 | 6 |
| Scanlan, C. | 0 | 10 | 6 |
| Scanlan, F. W. | 0 | 2 | 6 |
| Skellon, W. | 0 | 2 | 6 |
| Slack, J. L. | 0 | 2 | 6 |
| Smith, E. | 0 | 5 | 0 |
| Spilsbury, J. | 0 | 5 | 0 |
| Standring and Co. | 1 | 1 | 0 |
| Stones, W. | 1 | 1 | 0 |
| Stratford, A. J. | 0 | 2 | 6 |
| Sutcliffe, C. H. | 0 | 5 | 0 |
| Taylor, J. | 0 | 5 | 0 |
| Teasdale, C. | 0 | 10 | 6 |
| Terry, Thomas (Withington) | 0 | 5 | 0 |
| Thompson, H. | 0 | 2 | 6 |
| Towle, A. P. and Son | 1 | 1 | 0 |
| Towles, Rev. R. E. | 0 | 2 | 0 |
| Tucker, C. H. | 0 | 5 | 0 |
| Turner, C. | 0 | 10 | 6 |
| Turner, W. S. | 0 | 10 | 6 |
| Twemlow, Richard | 0 | 10 | 6 |
| Vallance, A. C. | 0 | 5 | 0 |
| Walton, D. | 0 | 2 | 6 |
| Walton, J. W. | 0 | 5 | 0 |
| West, H. T. | 0 | 2 | 6 |
| West, Thomas | 0 | 5 | 0 |
| Westmacott, George H. | 0 | 10 | 6 |
| Whitaker, T. | 0 | 5 | 0 |
| Wild, John | 0 | 5 | 0 |
| Wilkinson, George | 0 | 5 | 0 |
| Wilkinson, William | 0 | 5 | 0 |
| Williams, J. B. | 0 | 15 | 6 |
| Woolley, Sons and Co | 5 | 5 | 0 |
| Wright and Barnaby | 0 | 10 | 6 |
| Yates, Ebenezer | 0 | 5 | 0 |

### Mansfield.

| | | | |
|---|---|---|---|
| Adams, Benjamin | 1 | 1 | 0 |

### Margate.

| | | | |
|---|---|---|---|
| Harvey, William S. | 0 | 10 | 6 |
| Morton, H. R. | 0 | 2 | 6 |
| Pettman, R. | 0 | 10 | 6 |

### Market Drayton.

| | | | |
|---|---|---|---|
| Cooke, William | 0 | 5 | 0 |

### Market Harborough.

| | | | |
|---|---|---|---|
| Adams, H. G. | 0 | 5 | 0 |
| Bragg, W. B. | 0 | 5 | 0 |
| Maynard, H. R. | 0 | 5 | 0 |

### Market Weighton.

| | | | |
|---|---|---|---|
| Marshall, J. J. | 0 | 5 | 0 |

### Marton (New Zealand).

| | | | |
|---|---|---|---|
| Wilton, M. H. | 1 | 1 | 0 |

### Maryport.

| | | | |
|---|---|---|---|
| Cockton, John | 0 | 5 | 0 |

### Masham (Yorks).

| | | | |
|---|---|---|---|
| Barker, Mathew M. | 1 | 1 | 0 |

### Mayfield.

| | | | |
|---|---|---|---|
| White, Edward A. | 0 | 5 | 0 |

### Melksham.

| | | | |
|---|---|---|---|
| Bush, J. E. | 0 | 2 | 6 |

### Melton Mowbray.

| | | | |
|---|---|---|---|
| Attenburrow, Jas. | 0 | 5 | 0 |
| Gill, Josiah | 0 | 5 | 0 |
| Wing, G. N. | 0 | 5 | 0 |

### Messina.

| | | | |
|---|---|---|---|
| arrett, A. A. | 0 | 5 | 0 |

### Mexborough.

| | £ | s. | d. |
|---|---|---|---|
| Lee, J. A. R. | 0 | 2 | 6 |
| Shields, R. J. | 0 | 5 | 0 |

### Middlesborough.

| | | | |
|---|---|---|---|
| Hume, William A. | 0 | 6 | 0 |
| Taylor, H. H. | 0 | 5 | 0 |
| Taylor, William R. | 0 | 5 | 0 |

### Middleton (Lancs.).

| | | | |
|---|---|---|---|
| Parker, J. H. | 0 | 5 | 0 |

### Middlewich.

| | | | |
|---|---|---|---|
| Holland, H. | 0 | 10 | 0 |

### Mildmar (N.B.)

| | | | |
|---|---|---|---|
| Milne, J. (Comars) | 0 | 2 | 6 |

### Millom.

| | | | |
|---|---|---|---|
| Roberts, John L. | 0 | 2 | 6 |

### Milverton (Warwickshire).

| | | | |
|---|---|---|---|
| Waldron, A. | 0 | 2 | 6 |

### Minchinhampton.

| | | | |
|---|---|---|---|
| Simpkins, J. | 0 | 10 | 6 |

### Mirfield (Yorks).

| | | | |
|---|---|---|---|
| Barker, G. | 0 | 5 | 0 |
| Crook, Charles | 0 | 5 | 0 |

### Monmouth.

| | | | |
|---|---|---|---|
| Marsh, G. W. F. | 0 | 10 | 6 |

### Montrose.

| | | | |
|---|---|---|---|
| Burrell, T. | 0 | 5 | 0 |
| Davidson, A. | 0 | 5 | 0 |

### Morecambe.

| | | | |
|---|---|---|---|
| Birkett, J. | 0 | 5 | 0 |
| Fell, J. J. | 0 | 5 | 0 |

### Morpeth.

| | | | |
|---|---|---|---|
| Davidson, T. R. | 0 | 5 | 0 |
| Schofield, F. E. | 0 | 5 | 0 |

### Motherwell.

| | | | |
|---|---|---|---|
| Martin, J. | 0 | 5 | 0 |
| Scott, R. A. | 0 | 2 | 6 |

### Nairn.

| | | | |
|---|---|---|---|
| McIntosh, J. | 0 | 2 | 6 |

### Nantwich.

| | | | |
|---|---|---|---|
| Manley, Henry (Aston) | 0 | 2 | 6 |

### Neath.

| | | | |
|---|---|---|---|
| Isaac, J. G. | 0 | 5 | 0 |

### Nelson.

| | | | |
|---|---|---|---|
| Collins, M. A. | 0 | 10 | 6 |

### New Malden (Surrey).

| | | | |
|---|---|---|---|
| Stammwitz, Louisa | 0 | 10 | 6 |

### Newark.

| | | | |
|---|---|---|---|
| Bennett, William | 0 | 5 | 0 |
| Cherrington, G. W. | 0 | 5 | 0 |
| Cooling, W. J. | 0 | 10 | 6 |
| March, William | 0 | 5 | 0 |
| Priestley, L. | 0 | 2 | 6 |
| Taylor, J. and Son | 0 | 10 | 6 |

### New Brighton.

| | | | |
|---|---|---|---|
| Walker, Joseph | 0 | 5 | 0 |

### New Buckenham.

| | | | |
|---|---|---|---|
| Williams, John L. | 0 | 5 | 0 |

### Newbury.

| | | | |
|---|---|---|---|
| Pratt, Thomas H. | 0 | 5 | 0 |

### Newcastle-on-Tyne.

| | | | |
|---|---|---|---|
| Arnison, W. S. | 0 | 5 | 0 |
| Bell, F. E. | 0 | 10 | 6 |
| Bell, P. | 0 | 2 | 6 |
| Bolan, John | 0 | 10 | 6 |
| Cantrill, W. W. | 0 | 5 | 0 |
| Cormack, G. | 0 | 2 | 6 |
| Coxon, Mrs. E. | 0 | 2 | 6 |
| Dean, E. | 0 | 2 | 6 |
| Dudderidge, F. R. | 0 | 5 | 0 |
| Forbes, R. | 0 | 5 | 0 |
| Forster, J. R. | 0 | 5 | 0 |
| Frater, G. | 0 | 10 | 6 |

### Newcastle-on-T.—contd.

| | £ | s. | d. |
|---|---|---|---|
| Hallaway, R. R. | 0 | 5 | 0 |
| Ismay and Sons | 0 | 10 | 6 |
| Marley, William | 0 | 10 | 6 |
| Martin, J. | 0 | 5 | 0 |
| Martin, N. H. | 1 | 1 | 0 |
| Owen, William | 0 | 10 | 6 |
| Park, F. | 0 | 10 | 6 |
| Penman, E. W. | 0 | 2 | 6 |
| Proctor, Son and Clague | 1 | 1 | 0 |
| Rheeder, T. | 0 | 10 | 0 |
| Richardson, Alexander | 0 | 5 | 0 |
| Ridley, T. | 0 | 2 | 6 |
| Sloan, R. C. | 0 | 5 | 0 |
| Smith, G. F. | 0 | 5 | 0 |
| Spargo, H. | 0 | 10 | 6 |
| Stuart, Charles E. | 0 | 10 | 6 |
| Swan, J. W. | 1 | 1 | 0 |
| Weddell, G. | 0 | 10 | 6 |
| Wilkinson and Simpson | 1 | 1 | 0 |
| Wood, W. | 0 | 5 | 0 |

### Newcastle (Staffs.).

| | | | |
|---|---|---|---|
| Heathcote, Thomas S. | 0 | 10 | 6 |
| Poole and Son | 0 | 10 | 6 |

### Newhaven (N.B.).

| | | | |
|---|---|---|---|
| Mitchell, W. K. | 0 | 3 | 0 |

### Newhaven (Sussex).

| | | | |
|---|---|---|---|
| Granger, Harold | 0 | 5 | 0 |

### Newmarket.

| | | | |
|---|---|---|---|
| Barrow, Frank A. | 1 | 1 | 0 |

### Newport (Isle of Wight).

| | | | |
|---|---|---|---|
| Millidge, Alfred | 0 | 10 | 6 |
| Shepperd, William J. | 0 | 5 | 0 |

### Newport (Mon.).

| | | | |
|---|---|---|---|
| Atkins, A. E. | 0 | 5 | 0 |
| Evans, David | 0 | 5 | 0 |
| Firth, M. | 0 | 5 | 0 |
| Garrett, T. P. | 0 | 5 | 0 |
| Lewis, T. | 0 | 2 | 6 |
| Paine, Charles | 0 | 10 | 6 |
| Phillips, James W. | 0 | 5 | 0 |
| Smith, Albert | 0 | 5 | 0 |
| Williams, A. G. | 0 | 5 | 0 |
| Young, John | 0 | 10 | 6 |

### Newport Pagnell.

| | | | |
|---|---|---|---|
| Taylor, F. W. | 0 | 10 | 0 |

### Newport (Salop).

| | | | |
|---|---|---|---|
| Picken, T. W. | 0 | 5 | 0 |

### Newton Abbot.

| | | | |
|---|---|---|---|
| Bibbings, J. H. | 0 | 5 | 0 |
| Cornelius, J. | 0 | 5 | 0 |
| Rogers, E. H. | 0 | 2 | 6 |
| Stiling, John E. | 0 | 10 | 6 |
| Whineray, E. | 0 | 5 | 0 |
| Wright, W. | 0 | 5 | 0 |

### Newtown (Mont.).

| | | | |
|---|---|---|---|
| Morgan, Richard | 0 | 10 | 6 |

### New York (U.S.A.).

| | | | |
|---|---|---|---|
| Lamb, T. | 0 | 10 | 0 |

### Nice (France).

| | | | |
|---|---|---|---|
| Moore, J. | 0 | 4 | 6 |
| Nicholls, A. | 1 | 1 | 0 |

### Northallerton.

| | | | |
|---|---|---|---|
| Fairburn, H. | 0 | 2 | 6 |
| Squince, J. A. | 0 | 2 | 6 |

### Northampton.

| | | | |
|---|---|---|---|
| Barry, James | 1 | 1 | 0 |
| Bingley, John | 0 | 10 | 6 |
| Clower, John | 0 | 5 | 0 |
| Kirby, Frederick | 0 | 10 | 6 |
| Mayger, William D. | 0 | 10 | 6 |
| McKinnell, W. | 0 | 5 | 0 |
| Negus, J. H. | 0 | 5 | 0 |
| Sindall, J. W. (Executors of) | 0 | 5 | 0 |
| Ward, O. T. | 0 | 5 | 0 |

### Northleach (Glos.)

| | | | |
|---|---|---|---|
| Tayler, E. W. | 0 | 2 | 6 |

### North Walsham.

| | | | |
|---|---|---|---|
| Bailey, George Wm. | 0 | 5 | 0 |

### Northwich.

| | £ | s. | d. |
|---|---|---|---|
| Clough, John C. | 0 | 10 | 0 |
| Deakin. J. W. | 0 | 5 | 0 |
| Humphreys, Griffith | 0 | 5 | 0 |
| Lee, William | 0 | 5 | 0 |
| Ramsey, J. | 0 | 2 | 6 |

### Norwich.

| | | | |
|---|---|---|---|
| Betts, George | 0 | 10 | 6 |
| Caley, Albert J. | 1 | 1 | 0 |
| Corder, Edward | 0 | 10 | 6 |
| Corder, Octavius | 1 | 1 | 0 |
| Cossey, John | 0 | 5 | 0 |
| Cullen, F. S. | 0 | 5 | 0 |
| Dawson, W. T. | 0 | 5 | 0 |
| DeCarle, H. E. | 0 | 5 | 0 |
| Fitch, J. R. | 0 | 5 | 0 |
| Fuller, T. B. | 0 | 5 | 0 |
| Gardiner, W. | 0 | 7 | 6 |
| Hayhoe, W. | 0 | 5 | 0 |
| King, H. A. | 0 | 5 | 0 |
| Mallett, H. P. | 0 | 5 | 6 |
| Mason, Philip H. | 0 | 10 | 6 |
| Nuttall, Edwin | 0 | 10 | 0 |
| Pitts, W. C. | 0 | 5 | 0 |
| Robinson, James | 0 | 5 | 6 |
| Silver, S. W. | 0 | 2 | 6 |
| Smith, Joseph de Carl, jun. | 0 | 10 | 6 |
| Sutton, Francis | 0 | 10 | 6 |
| Taylor, H. E. | 1 | 11 | 0 |
| Thompson, H. | 0 | 5 | 0 |
| Watson, J. E. H. | 0 | 10 | 6 |

### Norwood.

| | | | |
|---|---|---|---|
| Atkinson, J. G. (Upper) | 1 | 1 | 0 |
| Beale, F. W. (South) | 0 | 10 | 6 |
| Birch, H. C. (Upper) | 1 | 1 | 0 |
| Golds, L. G. (Upper) | 0 | 10 | 6 |
| Izod and Son (Upper) | 1 | 1 | 0 |
| Palmer, F. (Upper) | 0 | 10 | 6 |
| Peake, W. A. (South) | 0 | 5 | 0 |
| Prime, T. R. (Upper) | 0 | 10 | 6 |
| Ramsey, W. (Upper) | 0 | 10 | 6 |
| Rees, H. (South) | 1 | 1 | 0 |
| Stacy, F. (Upper) | 0 | 5 | 0 |
| Wallis, G. (South) | 0 | 5 | 0 |
| White, C. E. (South) | 0 | 10 | 6 |

### Nottingham.

| | | | |
|---|---|---|---|
| Clarkson, R. B. | 0 | 2 | 6 |
| Cowley, H. W. | 0 | 5 | 0 |
| Dadley, Elijah | 0 | 10 | 6 |
| Eberlin, A. | 0 | 10 | 0 |
| Flowerdew, W. C. | 0 | 2 | 6 |
| Gaskin, J. H. | 0 | 2 | 6 |
| Gill, W. | 0 | 5 | 0 |
| Ingle, G. | 0 | 5 | 0 |
| Lumby, Fred | 0 | 5 | 0 |
| Manfull, H. J. | 0 | 5 | 0 |
| Middleton, A. | 0 | 5 | 0 |
| Newball and Mason | 1 | 1 | 0 |
| Parker, W. H. | 0 | 10 | 6 |
| Rayson, J. T. | 0 | 5 | 0 |
| Robinson, Joseph | 0 | 2 | 6 |
| Smithurst, John | 0 | 5 | 0 |
| Taylor, Thomas C. | 1 | 1 | 0 |
| Watkinson, Thos. | 1 | 1 | 0 |

### Nuneaton.

| | | | |
|---|---|---|---|
| Iliffe, George | 0 | 5 | 0 |
| Lester, Henry | 0 | 5 | 0 |

### Oakham.

| | | | |
|---|---|---|---|
| Wellington, J. | 0 | 10 | 6 |

### Oban (N.B.).

| | | | |
|---|---|---|---|
| Robertson, A. | 0 | 2 | 6 |

### Odiham.

| | | | |
|---|---|---|---|
| Woodman, George | 0 | 5 | 0 |

### Oldbury.

| | | | |
|---|---|---|---|
| Homes, Joseph P. | 0 | 5 | 0 |

### Old Charlton.

| | | | |
|---|---|---|---|
| Wigg, L. N. | 0 | 5 | 0 |

### Oldham.

| | | | |
|---|---|---|---|
| Bagshaw, Henry B. | 0 | 10 | 6 |
| Bagshaw, William | 0 | 10 | 6 |
| Bates, Henry | 0 | 10 | 6 |
| Bates, Hiram | 0 | 5 | 0 |
| Braddock, George | 1 | 1 | 0 |
| Brelsford, James | 0 | 10 | 6 |
| Burnett, W. | 0 | 5 | 0 |
| Geddes, William | 0 | 5 | 0 |
| Goodall, F. | 0 | 10 | 6 |

### Oldham—continued.

| | £ | s. | d. |
|---|---|---|---|
| Hargraves, H. L. | 0 | 10 | 6 |
| Haslop, William | 0 | 5 | 0 |
| Hurst, James | 0 | 5 | 0 |
| Lees, James | 0 | 2 | 6 |
| Lord, Robert B. | 0 | 5 | 0 |
| Platt, Mrs. M. | 0 | 2 | 6 |
| Tomlinson, A. G. | 0 | 5 | 0 |
| White, W. | 0 | 5 | 0 |
| Wilson, Alexander G. | 0 | 5 | 0 |

### Olney.

| | | | |
|---|---|---|---|
| Brittan, T. B. | 0 | 2 | 6 |

### Ootacamund.

| | | | |
|---|---|---|---|
| Petter, E. A. | 0 | 4 | 6 |

### Orlingbury.

| | | | |
|---|---|---|---|
| Islip, C. C. | 0 | 5 | 0 |

### Oswaldtwistle.

| | | | |
|---|---|---|---|
| Monk, A. T. | 0 | 5 | 0 |

### Oswestry.

| | | | |
|---|---|---|---|
| Evans, John | 0 | 5 | 0 |
| Roberts, William Carey | 0 | 2 | 6 |
| Smale, Richard B. | 0 | 10 | 6 |
| Vaughan, David | 0 | 5 | 0 |

### Otley (Yorks).

| | | | |
|---|---|---|---|
| Hamond, J. | 0 | 5 | 0 |
| Pratt, Richard M. | 0 | 10 | 6 |

### Oundle.

| | | | |
|---|---|---|---|
| Roper, H. E. | 0 | 5 | 0 |

### Oxford.

| | | | |
|---|---|---|---|
| Bloxham, W. E. | 0 | 15 | 6 |
| Brooks, H. J. R. | 0 | 2 | 6 |
| Burbank, T. J. A. R. | 0 | 2 | 6 |
| Clayton, C. | 0 | 2 | 6 |
| Court, G. F. | 0 | 5 | 0 |
| Druce, George C. | 0 | 10 | 6 |
| Gilkes, W. H. | 0 | 5 | 0 |
| Hill, James H. | 0 | 5 | 0 |
| How, R. E. | 0 | 5 | 0 |
| Jenkins, Alexander | 0 | 5 | 0 |
| Mason, J. | 0 | 2 | 6 |
| Mathews, H. | 1 | 1 | 0 |
| Morrison, C. P. A. | 0 | 5 | 0 |
| Prior, George T. | 0 | 10 | 6 |
| Shrimpton, F. G. | 0 | 2 | 6 |
| Squire, James | 0 | 5 | 0 |
| Thurland, Henry | 0 | 10 | 6 |

### Paignton.

| | | | |
|---|---|---|---|
| Riches, T. | 0 | 5 | 0 |
| Sherriff, George | 0 | 5 | 0 |

### Paisley.

| | | | |
|---|---|---|---|
| MacCowan, R. T. | 0 | 5 | 0 |
| Stewart, H. | 0 | 2 | 6 |

### Partick (N.B.).

| | | | |
|---|---|---|---|
| McNicol, John | 0 | 5 | 0 |
| Rait, Robert C. | 0 | 10 | 6 |

### Pau (France).

| | | | |
|---|---|---|---|
| Jarvis, John | 1 | 1 | 0 |

### Paulton (Somerset).

| | | | |
|---|---|---|---|
| Bush, Thomas | 0 | 5 | 0 |

### Pembroke Dock.

| | | | |
|---|---|---|---|
| Bowling, J. H. | 0 | 2 | 6 |
| Culwick, G. H. J. | 0 | 5 | 0 |
| Laen, Mrs. S. | 0 | 5 | 0 |
| Thomas, J. M. | 0 | 2 | 6 |
| Williams, C. | 0 | 5 | 0 |

### Pendleton.

| | | | |
|---|---|---|---|
| Blore, G. J. | 0 | 2 | 6 |
| Gill and Son | 0 | 10 | 6 |
| Harrop, J. H. | 0 | 10 | 0 |
| Hudson, J. E. | 0 | 5 | 0 |
| Jeans, Thomas R. | 0 | 5 | 0 |
| Robinson, B. | 0 | 5 | 0 |
| Smith, J. L. | 0 | 2 | 6 |

### Penrith.

| | | | |
|---|---|---|---|
| Scott, J. H. | 0 | 5 | 0 |

### Pensford.

| | | | |
|---|---|---|---|
| Dudden, R. M. | 0 | 5 | 0 |

### Pentre (Rhondda).

| | £ | s. | d. |
|---|---|---|---|
| Lloyd, R. | 0 | 5 | 0 |

### Penygraig (Rhondda).

| | | | |
|---|---|---|---|
| Lloyd, R. | 0 | 5 | 0 |

### Penzance.

| | | | |
|---|---|---|---|
| Buckett, A. H. | 0 | 5 | 0 |
| Shakerley, Benjamin | 0 | 5 | 0 |
| Symons, N. H. | 0 | 5 | 0 |

### Perth.

| | | | |
|---|---|---|---|
| Donald, David | 0 | 10 | 6 |

### Peterborough.

| | | | |
|---|---|---|---|
| Althorp, H. | 0 | 2 | 6 |
| Bodger, J. W. | 0 | 7 | 6 |
| Booth, Samuel | 0 | 2 | 6 |
| Bright, Richard H. D. | 0 | 2 | 6 |
| Calcutt, T. J. | 0 | 2 | 6 |
| Carlton, Arthur | 0 | 10 | 6 |
| Heanley and Saunders | 0 | 10 | 6 |
| Howard, A | 0 | 5 | 0 |
| Knight, W. T. | 0 | 10 | 6 |
| Noble, H. E. | 0 | 2 | 6 |
| Pearson, John H. | 0 | 2 | 6 |
| Sturton and Sons | 0 | 10 | 6 |
| Turner, R. P. | 0 | 2 | 6 |
| Whitwell, Ewen | 0 | 5 | 0 |

### Peterhead.

| | | | |
|---|---|---|---|
| Locher, J. F. | 0 | 5 | 0 |

### Petersfield.

| | | | |
|---|---|---|---|
| Nichols, Frederic B. | 0 | 5 | 0 |

### Petworth.

| | | | |
|---|---|---|---|
| Whitcombe, C. | 0 | 5 | 0 |

### Plymouth.

| | | | |
|---|---|---|---|
| Andrews, T. N. | 0 | 5 | 0 |
| Allen, Joseph | 0 | 10 | 6 |
| Bailey, John H. | 0 | 5 | 0 |
| Bailey, J. Richard | 1 | 1 | 0 |
| Balkwill, A. P. | 2 | 2 | 0 |
| Barge, John | 0 | 5 | 0 |
| Blackmore, J. F. | 0 | 2 | 6 |
| Cantle, H. | 0 | 2 | 6 |
| Carveth, W. V. | 0 | 2 | 6 |
| Coombe, S. | 0 | 2 | 6 |
| Cox, F. F. | 0 | 2 | 6 |
| Dance, C. K. | 0 | 2 | 6 |
| Dangerfield, E. | 0 | 2 | 6 |
| Downing, T. J. W. | 0 | 2 | 6 |
| Filmer, J. H. | 0 | 2 | 6 |
| Findlay, J. | 0 | 5 | 0 |
| Foster, F. H. | 0 | 5 | 0 |
| Goodwin, Medmer | 0 | 10 | 6 |
| Hearder, H. P. | 0 | 10 | 6 |
| Hender, W. C. | 0 | 5 | 0 |
| Hetherington, A. H. | 0 | 5 | 0 |
| Hunt, F. W. | 0 | 10 | 6 |
| Jones, E. O. | 0 | 2 | 6 |
| Luke, R. S. | 0 | 5 | 0 |
| Maitland, S. | 0 | 2 | 6 |
| Martin, J. | 0 | 5 | 0 |
| Martin, W. M. | 0 | 2 | 6 |
| Maurice, James | 2 | 2 | 0 |
| Menhenick, C. H. F. | 0 | 5 | 0 |
| Netting, J. G. | 0 | 5 | 0 |
| Park, Charles J. | 0 | 10 | 6 |
| Roper, R. F. | 0 | 5 | 0 |
| Sloggett, Thomas C. | 0 | 5 | 0 |
| Taveney, W. S. | 0 | 2 | 6 |
| Turney, J. D. | 0 | 5 | 0 |
| Turney, Samuel B. | 0 | 5 | 0 |
| Turney, F. E. | 0 | 2 | 6 |
| U'Ren, W. C. | 0 | 5 | 0 |
| Weary, C. T. | 0 | 5 | 0 |
| Westcott, H. O. | 0 | 2 | 6 |
| Williams, S. R. | 0 | 5 | 0 |
| Williams, T. J. | 0 | 2 | 6 |
| Woods, William | 1 | 1 | 0 |
| Woods, W. H. | 0 | 5 | 0 |

### Pocklington.

| | | | |
|---|---|---|---|
| Boyden, John A. C. | 0 | 2 | 6 |

### Pontefract.

| | | | |
|---|---|---|---|
| Bratley, William | 0 | 5 | 0 |

### Pontlottyn.

| | | | |
|---|---|---|---|
| Roberts, W. | 0 | 5 | 0 |

### Pontypool.

| | | | |
|---|---|---|---|
| Ford, Edward B. | 0 | 10 | 6 |

### Pontypridd.

| | £ | s. | d. |
|---|---|---|---|
| Cule, Taliesin | 1 | 1 | 0 |

### Port Elizabeth (Cape Colony).

| | | | |
|---|---|---|---|
| Willet, John A. | 0 | 10 | 6 |

### Porth.

| | | | |
|---|---|---|---|
| Davies, Thomas | 0 | 10 | 6 |

### Portishead.

| | | | |
|---|---|---|---|
| Pinch, J. E. | 0 | 5 | 0 |

### Portland.

| | | | |
|---|---|---|---|
| Childs, Joseph L. | 0 | 5 | 0 |

### Portmadoc.

| | | | |
|---|---|---|---|
| Morris, D. | 0 | 2 | 6 |

### Portobello.

| | | | |
|---|---|---|---|
| Nesbit, James | 0 | 5 | 0 |
| Nesbit, John | 1 | 1 | 0 |

### Portsmouth.

| | | | |
|---|---|---|---|
| Bailey, H. H. | 0 | 2 | 6 |
| Brewis, T. | 1 | 1 | 0 |
| Chettle, H. T. | 0 | 5 | 0 |
| Cooper, J. | 0 | 2 | 6 |
| Cruse and Co. | 1 | 1 | 0 |
| Deacon, F. G. | 0 | 5 | 0 |
| Ford, H. S. | 0 | 5 | 0 |
| Gall, F. | 0 | 2 | 6 |
| Hoit, A. H. | 0 | 2 | 6 |
| Linstead, E. F. | 0 | 5 | 0 |
| Lowther, W. | 0 | 5 | 0 |
| Mumby, C. and Co. | 1 | 1 | 0 |
| Perfect, Geo. | 0 | 5 | 0 |
| Langster, J. G. | 0 | 5 | 0 |
| Trist, R. | 0 | 5 | 0 |
| Watts, W. | 0 | 5 | 0 |

### Portsoy.

| | | | |
|---|---|---|---|
| Clark, James | 0 | 5 | 0 |

### Potton (Beds.).

| | | | |
|---|---|---|---|
| Irving, T. S. | 0 | 5 | 0 |
| Smith, C. B. | 0 | 5 | 0 |

### Poulton-le-Fylde (Lancs.).

| | | | |
|---|---|---|---|
| Blade, E. | 0 | 5 | 0 |
| Rhodes, Mrs. A. | 0 | 5 | 0 |

### Preston.

| | | | |
|---|---|---|---|
| Adamson, W. F. | 0 | 2 | 6 |
| Arkle, C. A. | 0 | 5 | 0 |
| Barnes, T. | 0 | 2 | 6 |
| Bowker, W. | 0 | 2 | 6 |
| Freeman, H. S. | 0 | 2 | 6 |
| Hackforth, F. | 0 | 2 | 6 |
| Hargreaves, J. and Son | 0 | 2 | 6 |
| Leece, F. | 0 | 2 | 6 |
| Lewty, A. E. R. | 0 | 2 | 6 |
| Livesay, W. F. | 0 | 2 | 6 |
| Marsden, J. | 0 | 2 | 6 |
| Miller, N. | 0 | 2 | 6 |
| Parkinson, R. H. | 0 | 2 | 6 |
| Patterson, T. | 0 | 2 | 6 |
| Rae, J. | 0 | 2 | 6 |
| Sharples, George | 0 | 5 | 0 |
| Stuart, W. | 0 | 5 | 0 |
| Taylor, G. | 0 | 2 | 6 |
| Walker, J. E. | 0 | 2 | 6 |
| Waterworth, A. | 0 | 2 | 6 |
| Waterworth, E. | 0 | 2 | 6 |
| Watkinson, W. J. | 0 | 2 | 6 |
| Williamson, F. A. | 0 | 2 | 6 |

### Prestwich.

| | | | |
|---|---|---|---|
| Mercer, A. | 0 | 5 | 0 |

### Purley.

| | | | |
|---|---|---|---|
| Ray, C. | 0 | 2 | 6 |

### Queenstown (South Africa).

| | | | |
|---|---|---|---|
| Mager, W. K. | 0 | 10 | 6 |

### Ramsgate.

| | | | |
|---|---|---|---|
| Argue, James | 0 | 5 | 0 |
| Baily, E. | 0 | 5 | 0 |
| Fox, C. J. | 0 | 5 | 0 |
| Franks, Alfred | 0 | 5 | 0 |
| Morton, Henry | 0 | 5 | 0 |
| Pavey, and Co. | 0 | 5 | 0 |
| Saunders, Charles J. H. | 0 | 2 | 6 |
| Thomas, H. | 1 | 1 | 0 |
| Wells, A. J. | 0 | 10 | 0 |

### Rawcliffe (Yorks.).

| | | | |
|---|---|---|---|
| Kirk, J. R. | 0 | 2 | 6 |

### Reading.

| | £ | s. | d. |
|---|---|---|---|
| Aplin, A. E. | 0 | 5 | 0 |
| Ashfield, A. | 0 | 5 | 0 |
| Biddles, W. B. | 0 | 5 | 0 |
| Bradley, Charles | 0 | 10 | 6 |
| Brunsden, E. | 0 | 2 | 6 |
| Butler, B. H. | 0 | 5 | 0 |
| Cardwell, E. | 0 | 10 | 6 |
| Coles, S. J. | 0 | 5 | 0 |
| Craft, James | 0 | 5 | 0 |
| Dowling, R., jun. | 0 | 5 | 0 |
| Emberton, F. C. | 0 | 5 | 0 |
| Gibson, J. E. | 0 | 5 | 0 |
| Hayward, S. | 0 | 2 | 6 |
| Knowles, J. H. | 0 | 5 | 0 |
| Long, H. | 0 | 10 | 6 |
| Mays, F. W. | 0 | 5 | 0 |
| Milton, H. | 0 | 5 | 0 |
| Powell, J. A. | 0 | 5 | 0 |
| Rowell, John C. | 0 | 5 | 0 |
| Smith, A. B. | 0 | 10 | 6 |
| Tunbridge, Frederick | 0 | 10 | 6 |
| Wright, J. N. | 0 | 10 | 6 |
| Young, J. M. (Theale) | 0 | 5 | 0 |

### Redditch.

| | | | |
|---|---|---|---|
| Moule, William | 0 | 5 | 0 |

### Redhill.

| | | | |
|---|---|---|---|
| Cross, J. | 0 | 5 | 0 |
| Monk, F. A. | 0 | 5 | 0 |
| Padwick, T. | 0 | 10 | 6 |
| Sillitoe, F. S. | 1 | 1 | 0 |

### Reepham.

| | | | |
|---|---|---|---|
| Cripps, Johnson | 0 | 10 | 0 |

### Reigate.

| | | | |
|---|---|---|---|
| Bray, F. D. | 0 | 2 | 6 |
| Sargant, J. | 0 | 10 | 6 |
| Woodward, M. M. | 0 | 5 | 0 |

### Retford.

| | | | |
|---|---|---|---|
| Pater, E. R. | 0 | 5 | 0 |
| Westbrook, Dr. C. | 1 | 1 | 0 |

### Rhyl.

| | | | |
|---|---|---|---|
| Lawrence, George R. | 1 | 1 | 0 |
| Williams, A. H. | 0 | 5 | 0 |

### Richmond (Surrey).

| | | | |
|---|---|---|---|
| Bletsoe, F. F. | 0 | 10 | 6 |
| Bletsoe, John | 0 | 10 | 6 |
| Hume, H. E. | 0 | 5 | 0 |
| Palmer, J. T. | 0 | 10 | 6 |
| Thacker, William | 1 | 1 | 0 |

### Rickmansworth.

| | | | |
|---|---|---|---|
| Sumner, G. T. | 0 | 5 | 0 |

### Ripley (Derby).

| | | | |
|---|---|---|---|
| Rideal, F. | 0 | 2 | 6 |

### Ripon.

| | | | |
|---|---|---|---|
| Parkin, J. B. | 0 | 10 | 6 |
| Rudd, H. B. | 0 | 2 | 6 |
| Thornley, F. | 0 | 5 | 0 |

### Rochdale.

| | | | |
|---|---|---|---|
| Cross, E. R. | 0 | 2 | 6 |
| Duckworth, A. | 0 | 5 | 0 |
| Bamford, J. W. | 0 | 5 | 0 |
| Highley, William | 0 | 5 | 0 |
| Kerr, William | 0 | 2 | 6 |
| Mason, Arthur | 0 | 5 | 0 |
| Mercer, T. W. | 0 | 5 | 0 |
| Partington, William | 0 | 2 | 6 |
| Taylor, Edward | 0 | 5 | 0 |
| Thomas, E. | 0 | 2 | 6 |
| Whittaker, J. W. | 0 | 2 | 0 |

### Rochester.

| | | | |
|---|---|---|---|
| Brown, Hugh S. F. | 0 | 2 | 6 |
| Cowan, Frank | 0 | 5 | 0 |
| Hewitt, J. S. | 0 | 5 | 0 |
| Wyatt, C. F. | 0 | 5 | 0 |

### Romford.

| | | | |
|---|---|---|---|
| Lasham, John W. | 0 | 10 | 6 |

### Romsey.

| | | | |
|---|---|---|---|
| Kemp, C. T. | 0 | 5 | 0 |
| Oram, F. | 0 | 2 | 6 |

### Ross.

| | | | |
|---|---|---|---|
| Matthews, T. A. | 0 | 5 | 0 |

### Rothbury.

| | £ | s. | d. |
|---|---|---|---|
| Farrage, Robert | 0 | 10 | 6 |

### Rotherham.

| | | | |
|---|---|---|---|
| Bradshaw, C. H. | 1 | 1 | 0 |
| roll, G. J. | 0 | 5 | 0 |

### Rothesay.

| | | | |
|---|---|---|---|
| Duncan, William | 0 | 5 | 0 |

### Rothwell.

| | | | |
|---|---|---|---|
| Gray, A. U. | 0 | 2 | 6 |

### Runcorn.

| | | | |
|---|---|---|---|
| Weston, J. H. | 0 | 10 | 6 |

### Ruthin.

| | | | |
|---|---|---|---|
| Rouw, T. J. | 0 | 5 | 0 |

### Ryde (Isle of Wight).

| | | | |
|---|---|---|---|
| Bevis, W. | 0 | 2 | 6 |
| Dixon, Henry | 0 | 10 | 6 |
| Flower, T. C. | 0 | 2 | 6 |
| Gibbs, William | 0 | 10 | 6 |
| Pollard, Henry H. | 0 | 10 | 6 |
| Smith, Tenison | 0 | 10 | 6 |
| Smith, W. | 0 | 2 | 6 |

### Rye (Sussex).

| | | | |
|---|---|---|---|
| Horrell, W. H. D. | 0 | 5 | 0 |
| Waters, William A. | 0 | 10 | 6 |

### Saddleworth.

| | | | |
|---|---|---|---|
| Fryer, J. | 0 | 2 | 6 |

### Saffron Walden.

| | | | |
|---|---|---|---|
| Gilling, J. | 0 | 5 | 0 |
| Jones, J. S. | 0 | 10 | 6 |

### St. Albans.

| | | | |
|---|---|---|---|
| Allenby, Henry | 0 | 2 | 6 |
| Ekins, Arthur E. | 0 | 10 | 6 |

### St. Andrews.

| | | | |
|---|---|---|---|
| Bruce, A. K. | 0 | 10 | 0 |
| Cleghorn, Dr. | 1 | 0 | 0 |
| Govan, Alexander | 0 | 10 | 0 |
| Kirk, John J. | 0 | 5 | 0 |

### St. Austell.

| | | | |
|---|---|---|---|
| Bice, James | 0 | 5 | 0 |

### St. Boswells.

| | | | |
|---|---|---|---|
| Robertson, J. | 0 | 5 | 0 |

### St. Davids.

| | | | |
|---|---|---|---|
| David, Albert | 0 | 2 | 6 |

### St. Day.

| | | | |
|---|---|---|---|
| Corfield, Charles | 0 | 10 | 6 |

### St. Helens.

| | | | |
|---|---|---|---|
| Harrison, James | 0 | 5 | 0 |
| Sherlock, Thomas | 0 | 5 | 0 |
| Swift, C. W. | 0 | 2 | 6 |
| Wallbridge, J. G. | 0 | 2 | 6 |

### St. Just.

| | | | |
|---|---|---|---|
| Wearing, John | 0 | 2 | 6 |

### St. Leonards. See Hastings.

### St. Neots.

| | | | |
|---|---|---|---|
| Dukes, H. J. | 0 | 2 | 6 |
| Wise, James | 1 | 1 | 0 |

### Sale.

| | | | |
|---|---|---|---|
| Smith, A. | 0 | 2 | 6 |

### Salford (Lancs.).

| | | | |
|---|---|---|---|
| Bullock, A. H. | 0 | 2 | 6 |
| Bullock, H. | 0 | 2 | 6 |
| Butcher, G. S. | 0 | 10 | 6 |
| Denton, J. | 0 | 5 | 0 |
| Fletcher, J. E. | 0 | 2 | 6 |
| Gardner, E. | 0 | 2 | 6 |
| Johnson, W. H. | 0 | 10 | 6 |
| Reddish, A. F. | 0 | 2 | 6 |
| Waugh, J. | 0 | 5 | 0 |
| Whittaker, E. | 0 | 10 | 6 |

### Salisbury.

| | | | |
|---|---|---|---|
| Atkins, Samuel Ralph | 1 | 1 | 0 |
| Atkins, William R. | 0 | 10 | 6 |
| Hardy, R. E. | 0 | 10 | 6 |
| Hook, R. G. | 0 | 5 | 0 |
| Kerly, W. | 0 | 2 | 6 |
| Liddle C. | 0 | 5 | 0 |

### Salisbury—continued.

| | £ | s. | d. |
|---|---|---|---|
| Newton, F. H. | 0 | 5 | 0 |
| Newton, J. W. | 0 | 10 | 6 |
| Orchard, E. J. | 1 | 1 | 0 |
| Pickford, A. F. | 0 | 5 | 0 |
| Roe, S. | 0 | 5 | 0 |
| Rowe, J. | 0 | 5 | 0 |

### Saltburn-by-the-Sea.

| | | | |
|---|---|---|---|
| Taylor, William | 0 | 10 | 6 |

### Saltcoats.

| | | | |
|---|---|---|---|
| Walker, J. | 0 | 5 | 0 |

### Saltley.

| | | | |
|---|---|---|---|
| Strutt, E. B. | 0 | 5 | 0 |

### Sandbach.

| | | | |
|---|---|---|---|
| Gee, G. H | 0 | 2 | 6 |

### San Remo (Italy).

| | | | |
|---|---|---|---|
| Squire, Frank R. | 1 | 1 | 0 |

### Sandgate.

| | | | |
|---|---|---|---|
| Jenner, William M. | 0 | 5 | 0 |
| Kennett, E. | 0 | 2 | 6 |

### Sandown (Isle of Wight).

| | | | |
|---|---|---|---|
| Brown, G. | 0 | 5 | 0 |
| Cocksedge, H. B. | 1 | 1 | 0 |

### Sandwich.

| | | | |
|---|---|---|---|
| Baker, Frank | 0 | 10 | 6 |
| Dixon, William (Ash) | 0 | 5 | 0 |
| Woodruff, A. E. (Eastry) | 0 | 5 | 0 |

### Scarborough.

| | | | |
|---|---|---|---|
| Chapman, Henry | 0 | 10 | 6 |
| Clare and Hunt | 1 | 1 | 0 |
| Eccles, H. | 0 | 5 | 0 |
| Hill, R. | 0 | 2 | 6 |
| Hughes, John E. | 0 | 10 | 6 |
| Jones, Alfred | 0 | 5 | 0 |
| Parker, W. | 0 | 2 | 6 |
| Roberts, R. | 0 | 2 | 6 |
| Whitfield, G. | 0 | 5 | 0 |
| Whitfield, John | 1 | 1 | 0 |

### Seacombe.

| | | | |
|---|---|---|---|
| Hinkley, E. | 0 | 5 | 0 |
| Holt, Richard W. | 0 | 5 | 0 |
| Robinson, R. F. W. | 0 | 2 | 6 |

### Seaham Harbour.

| | | | |
|---|---|---|---|
| Storey, W. | 0 | 5 | 0 |

### Seaton.

| | | | |
|---|---|---|---|
| Skinner, G. J. | 0 | 5 | 0 |

### Sedgeley (Staffs.).

| | | | |
|---|---|---|---|
| Thompson, J. W. | 0 | 10 | 6 |

### Selkirk.

| | | | |
|---|---|---|---|
| Dunn, Thomas | 0 | 5 | 0 |

### Settle.

| | | | |
|---|---|---|---|
| Shepherd, J. W. | 0 | 10 | 6 |

### Sevenoaks.

| | | | |
|---|---|---|---|
| Barrat, R. | 0 | 5 | 0 |
| Pain, E. | 1 | 0 | 0 |
| Ventham, A. W. | 0 | 5 | 0 |

### Shallowford.

| | | | |
|---|---|---|---|
| Smith, E. R. | 0 | 10 | 6 |

### Shanklin (Isle of Wight).

| | | | |
|---|---|---|---|
| Deeks, W. T. | 0 | 2 | 6 |

### Sheepshed.

| | | | |
|---|---|---|---|
| Moore, Thomas | 0 | 5 | 0 |

### Sheerness.

| | | | |
|---|---|---|---|
| Hills, William J. | 0 | 2 | 6 |
| Prosser, David | 0 | 10 | 6 |

### Sheffield.

| | | | |
|---|---|---|---|
| Austin, J. | 0 | 2 | 6 |
| Bates, J. H. | 0 | 5 | 0 |
| Bradwall, J. H. | 0 | 5 | 0 |
| Carr, George | 0 | 5 | 0 |
| Carr, P. | 0 | 5 | 0 |
| Clayton, William | 0 | 10 | 6 |
| Dale, J. | 0 | 5 | 0 |
| Dobb, J. T. | 0 | 10 | 6 |
| Eardley, J. F. | 0 | 5 | 0 |
| Ellinor, George | 0 | 10 | 6 |
| Eyre, S. | 0 | 5 | 0 |
| Fox, A. R. | 0 | 10 | 6 |
| Furness, Joseph M. | 0 | 5 | 0 |

| **Sheffield—continued.** | £ | s. | d. |
|---|---|---|---|
| Gardner, J. | 0 | 2 | 6 |
| Haining, E. | 0 | 2 | 6 |
| Hewitt, C. H. | 0 | 10 | 6 |
| Hewitt, J. P. | 0 | 5 | 0 |
| Ibbitt, H. E. | 0 | 2 | 6 |
| Jepson, Xeno | 0 | 2 | 6 |
| Kirkby, W. | 0 | 2 | 6 |
| Lowe, S. P. | 0 | 5 | 0 |
| Marshall, J. | 0 | 5 | 0 |
| Miller, John T. | 0 | 5 | 0 |
| Miner, M. T. | 0 | 5 | 0 |
| Moffatt, C. D. | 0 | 2 | 6 |
| Morrison, C. O. | 0 | 5 | 0 |
| Newsholme, G. T. Wilkinson | 1 | 1 | 0 |
| Owen, G. B. | 0 | 5 | 0 |
| Preston, Job | 0 | 10 | 6 |
| Priestley, Henry | 0 | 10 | 6 |
| Smith, E. W. | 0 | 5 | 0 |
| Swift, A. H. | 0 | 2 | 6 |
| Turner, J. | 0 | 5 | 0 |
| Turner, J. W. J. | 0 | 5 | 0 |
| Twelves, C. H. | 0 | 2 | 6 |
| Ward, William | 0 | 10 | 6 |
| Watson, H. G. | 0 | 5 | 0 |
| Watson, Robert W. | 0 | 10 | 6 |
| Watts, J. | 0 | 5 | 0 |
| Wiles, Edwin | 0 | 5 | 0 |
| **Shepton Mallet.** | | | |
| Fudge, Charles William | 0 | 5 | 0 |
| **Sherringham (Norfolk).** | | | |
| Burrell, W. H. | 0 | 2 | 6 |
| **Shields, North.** | | | |
| Burn, Thomas | 0 | 2 | 6 |
| Gibson, James | 0 | 10 | 6 |
| **Shields, South.** | | | |
| Bottomley, L. W. | 0 | 5 | 0 |
| Forrest, Robert | 0 | 10 | 6 |
| Mays, A. | 0 | 5 | 0 |
| Noble, John | 0 | 5 | 0 |
| Riddle, J. | 0 | 5 | 0 |
| Sinclair, J. G. | 0 | 2 | 6 |
| Walker, James | 0 | 5 | 0 |
| Walker, J. B. | 0 | 5 | 0 |
| Williamson, B. | 0 | 10 | 6 |
| **Shildon.** | | | |
| Veitch, T. D. | 0 | 10 | 6 |
| **Shipdham.** | | | |
| Skoulding, W. G. | 0 | 5 | 0 |
| **Shrewsbury.** | | | |
| Adams, William | 1 | 1 | 0 |
| Blunt, T. P. | 1 | 1 | 0 |
| Cross, A. R. | 0 | 5 | 0 |
| Cross, William G. | 3 | 3 | 0 |
| Eldred, C. W. | 0 | 2 | 6 |
| Gouldbourn, William | 0 | 10 | 6 |
| King, L. W. | 0 | 5 | 0 |
| Perkins, Christopher | 0 | 5 | 0 |
| Pyefinch, John | 0 | 5 | 0 |
| Salter, Benjamin | 1 | 1 | 0 |
| Salter, Joseph B. | 1 | 1 | 0 |
| **Sidmouth.** | | | |
| Chessall, Rowland | 0 | 5 | 0 |
| **Silloth.** | | | |
| Smith, H. J. | 0 | 5 | 0 |
| **Sittingbourne.** | | | |
| Cocking, T. S. | 0 | 5 | 0 |
| Gordelier, William G. | 1 | 1 | 0 |
| Stedman, W. (Teynham) | 0 | 5 | 0 |
| **Skelton (in Cleveland).** | | | |
| Ellis, A. | 0 | 5 | 0 |
| **Sketty.** | | | |
| James, A. W. | 0 | 2 | 6 |
| **Sleaford.** | | | |
| Harrison, T. E. | 0 | 5 | 0 |
| Spyvee, W. | 0 | 5 | 0 |
| **Slough.** | | | |
| Elliman, Sons and Co. | 1 | 1 | 0 |
| Griffith and Walden | 0 | 10 | 6 |
| **Smallthorne.** | | | |
| Fletcher, Thomas | 0 | 10 | 6 |

| **Snaith.** | £ | s. | d. |
|---|---|---|---|
| Bean, John | 0 | 10 | 6 |
| **Solihull.** | | | |
| Pegg, H. | 1 | 1 | 0 |
| **Southall (Middlesex).** | | | |
| Diggens, E. D. | 0 | 5 | 0 |
| **Southampton.** | | | |
| Alderslade, W. | 0 | 5 | 0 |
| Andrews, W. | 0 | 3 | 6 |
| Bates, William | 0 | 5 | 0 |
| Bishop, Samuel | 0 | 5 | 0 |
| Borchert, Heinrich T. G. | 0 | 10 | 0 |
| Carter, H. A. | 0 | 5 | 0 |
| Chipperfield, R. | 1 | 1 | 0 |
| Dawson, Oliver R. | 0 | 10 | 6 |
| Hughes, J. H. | 0 | 5 | 0 |
| Johnson, W. E. | 0 | 5 | 0 |
| Madge, James C. | 0 | 10 | 6 |
| Mumford, Alfred | 0 | 10 | 6 |
| Randall, William B. | 1 | 1 | 0 |
| Rubie, J. T. | 0 | 5 | 0 |
| Spearing, James | 0 | 10 | 6 |
| Vertue, M. S. | 0 | 2 | 6 |
| **Southend.** | | | |
| Dawson, George R. | 0 | 5 | 0 |
| Ebbage, H. E. | 0 | 5 | 0 |
| Powers, E. | 0 | 5 | 0 |
| **South Molton.** | | | |
| Harris, J. B | 0 | 2 | 6 |
| Swingburn, Richard H. | 0 | 10 | 6 |
| **Southport.** | | | |
| Adams, C. M. | 0 | 10 | 6 |
| Ashton, William | 0 | 10 | 6 |
| Ball, Henry | 0 | 10 | 6 |
| Cave, J. R. | 0 | 5 | 0 |
| Crook, G. | 0 | 5 | 0 |
| Eatough, N. W. | 0 | 5 | 0 |
| Elliott, Stephen J. | 0 | 2 | 6 |
| Foggitt, J. B. | 0 | 5 | 0 |
| Gill, Hugh | 0 | 5 | 0 |
| Gill, W. S. | 0 | 2 | 6 |
| Gillett, J. (Executors of) | 0 | 5 | 0 |
| Hamer, J. A. | 0 | 5 | 0 |
| Hartley, T. | 0 | 5 | 0 |
| Laing, J. W. A. | 0 | 5 | 0 |
| Mainwaring, R. | 0 | 10 | 6 |
| Merchant and Co. | 0 | 5 | 0 |
| Neame, H. A. (Birkdale) | 0 | 2 | 6 |
| Righton, James | 0 | 10 | 6 |
| Roberts, H. (Birkdale) | 0 | 5 | 0 |
| Robinson, T. | 0 | 2 | 6 |
| Round, Frederick | 0 | 10 | 6 |
| Smith, F. J. | 0 | 5 | 0 |
| Surr, Edward | 0 | 10 | 6 |
| Sykes, J. | 0 | 5 | 0 |
| Whitworth, James | 0 | 5 | 0 |
| Wilding, G. J. (Birkdale) | 0 | 10 | 6 |
| Winter, William | 0 | 10 | 6 |
| **Southwell.** | | | |
| Bennett, G. | 0 | 5 | 0 |
| Downing, J. H. | 0 | 10 | 6 |
| **Southwold.** | | | |
| Critten, Robert P. | 0 | 2 | 6 |
| **Spalding.** | | | |
| Bell, E. W. | 0 | 5 | 0 |
| Bloodworth, T. | 0 | 5 | 0 |
| Donington, R. | 0 | 5 | 0 |
| **Spennymoor.** | | | |
| Burdon, Thomas A. | 0 | 5 | 0 |
| Farthing, G. T. | 0 | 5 | 0 |
| **Spilsby.** | | | |
| Rainey, J. J. | 0 | 5 | 0 |
| **Stafford.** | | | |
| Averill, Henry Alcock | 0 | 10 | 6 |
| Averill, John | 0 | 10 | 6 |
| Hawthorne, A. | 0 | 5 | 0 |
| **Stamford.** | | | |
| Clark, A. T. S. | 1 | 1 | 0 |
| Dickinson, Frederick | 0 | 10 | 6 |
| **Stanford-le-Hope.** | | | |
| Cushion, S. | 0 | 5 | 0 |
| **Stanningley (Yorks).** | | | |
| Powell, A. J. | 0 | 5 | 0 |

| **Stirling.** | £ | s. | d. |
|---|---|---|---|
| Muir, Mrs. T. | 1 | 1 | 0 |
| **Stockport.** | | | |
| Arnfield, J. C. | 0 | 5 | 0 |
| Ball, G. | 0 | 2 | 6 |
| Goddard, J. (Edgeley) | 0 | 5 | 0 |
| Johnson, Thomas J. | 0 | 5 | 0 |
| Kay Brothers | 2 | 2 | 0 |
| Lang, J. W. | 0 | 5 | 0 |
| Orton, W. B. | 0 | 5 | 0 |
| Plant, F. G. L. (Romiley) | 0 | 5 | 0 |
| Swingburn, B. | 0 | 2 | 6 |
| Wilson, A. E. | 0 | 2 | 6 |
| **Stockton-on-Tees.** | | | |
| Bainbridge, Robert R. | 0 | 2 | 6 |
| **Stoke-on-Trent.** | | | |
| Adams, Frank | 0 | 10 | 6 |
| Adams, William H. | 0 | 10 | 6 |
| Smith, Arthur H. | 0 | 10 | 6 |
| Wilson, Clement Fisher | 0 | 10 | 6 |
| **Stone (Staffs).** | | | |
| Slater, Thomas | 0 | 10 | 6 |
| Slater, Thomas, jun. | 0 | 5 | 0 |
| **Stonehaven (N.B.).** | | | |
| Finlayson, T. | 0 | 5 | 0 |
| Wood, A. L. | 0 | 2 | 6 |
| **Stonehouse (Devon).** | | | |
| Cocks, J. | 0 | 5 | 0 |
| Maitland, F. | 0 | 5 | 0 |
| Netten, Henry J. T. | 0 | 5 | 0 |
| **Stony Stratford.** | | | |
| Cox, Julia Jane | 0 | 10 | 6 |
| Robinson, William H. | 0 | 10 | 6 |
| **Stourbridge.** | | | |
| Biggs, F. W. | 0 | 5 | 0 |
| Burgess, William | 0 | 5 | 0 |
| Green, G. T. | 0 | 2 | 6 |
| Loverock, Henry | 0 | 5 | 0 |
| Selleck, W. R. | 0 | 5 | 0 |
| Simpkins, G. S. | 0 | 5 | 0 |
| Yeates, A. | 0 | 5 | 0 |
| **Stowmarket.** | | | |
| Gostling, George J. | 1 | 1 | 0 |
| Simpson, Robert G. | 0 | 5 | 0 |
| Wilson, Thomas | 0 | 5 | 0 |
| **Stradbroke.** | | | |
| Foulsham, Harry B. | 0 | 5 | 0 |
| **Stratford.** | | | |
| Eastman, J. E. | 0 | 10 | 6 |
| Cowles, C. | 1 | 1 | 0 |
| **Stratford-on-Avon.** | | | |
| Akerman, W. J. | 0 | 2 | 6 |
| **Strathpeffer Spa.** | | | |
| Maxwell, T. W. | 0 | 10 | 0 |
| **Stratton.** | | | |
| Pickard, Henry | 0 | 5 | 0 |
| **Streatham.** | | | |
| Shacklock, J. H. | 1 | 1 | 0 |
| **Strood.** | | | |
| Picnot, Charles | 1 | 1 | 0 |
| **Stroud.** | | | |
| Coley, Samuel J. | 0 | 10 | 6 |
| Hart, Jane | 0 | 10 | 0 |
| **Sudbury (Suffolk).** | | | |
| Brown, J. H. | 0 | 2 | 6 |
| **Sunbury-on-Thames.** | | | |
| Price, J. | 0 | 5 | 0 |
| **Sunderland.** | | | |
| Bell, R. H. | 0 | 5 | 0 |
| Bennet, A. R. | 0 | 2 | 6 |
| Bowman, S. | 0 | 5 | 0 |
| Cherret, E. R. | 0 | 5 | 0 |
| Fairman, George P. | 0 | 10 | 6 |
| Harrison, E. E. | 0 | 2 | 6 |
| Harrison, John | 1 | 1 | 0 |
| Hodgson, C. | 0 | 5 | 0 |
| Hodgson, R. | 0 | 5 | 0 |
| Hudson, W. | 0 | 5 | 0 |
| Leadbitter, W. W. | 0 | 2 | 6 |
| Mitchinson, John | 0 | 5 | 0 |

### Shrewsbury—continued.

| | £ | s. | d. |
|---|---|---|---|
| Purse, A. D. | 0 | 2 | 6 |
| Ranken, Charles | 0 | 5 | 0 |
| Sayer, J. R. | 0 | 5 | 0 |
| Scott, W. | 0 | 5 | 0 |
| Thompson, L. | 0 | 10 | 6 |
| Todd, M. J. | 0 | 2 | 6 |
| Walton, T. | 0 | 5 | 0 |

### Sunninghill (Berks.).

| | | | |
|---|---|---|---|
| Ball, W. B. | 0 | 5 | 0 |

### Surbiton.

| | | | |
|---|---|---|---|
| Acfield, William | 0 | 5 | 0 |
| Lowe, Charles | 0 | 10 | 6 |

### Sutton.

| | | | |
|---|---|---|---|
| Blyth, U. | 0 | 10 | 6 |
| Westlake, J. | 0 | 10 | 6 |

### Sutton Coldfield.

| | | | |
|---|---|---|---|
| Fletcher, F. | 0 | 5 | 0 |

### Swaffham.

| | | | |
|---|---|---|---|
| Bell, Frederick R. | 0 | 10 | 6 |
| Christopherson, Fred | 0 | 5 | 0 |
| Finch, Jacob | 0 | 10 | 6 |

### Swanage.

| | | | |
|---|---|---|---|
| Harman, E. S. | 0 | 5 | 0 |

### Swansea.

| | | | |
|---|---|---|---|
| Bevan, E. | 0 | 5 | 0 |
| Bevan, M. L. | 0 | 5 | 0 |
| Bonnett, F. | 0 | 5 | 0 |
| Davies, J. M. | 0 | 5 | 0 |
| Davies, John (31, High Street) | 0 | 5 | 0 |
| Davies, John (75, Oxford Street) | 0 | 5 | 0 |
| Davies, John (Walters Road) | 0 | 10 | 6 |
| Davies, William | 0 | 5 | 0 |
| Evans, D. L. | 0 | 2 | 6 |
| Evans, J. W. M. | 0 | 5 | 0 |
| Evans, M. D. | 0 | 5 | 0 |
| George, W. | 0 | 10 | 6 |
| Grose, Nicholas M. | 1 | 1 | 0 |
| Hughes, James | 0 | 5 | 0 |
| Jones, Moses | 0 | 10 | 6 |
| Jones, T. | 0 | 5 | 0 |
| Keall, F. P. | 0 | 10 | 6 |
| Lloyd, John W. | 0 | 5 | 0 |
| Lowther, H. R. | 0 | 5 | 0 |
| Powell, S. J. | 0 | 2 | 6 |
| Rees, Daniel | 0 | 5 | 0 |
| Roberts, J. K. | 0 | 5 | 0 |
| Thomas, Evan | 0 | 10 | 6 |
| Thomas, L. | 0 | 5 | 0 |
| Thomas, T. | 0 | 5 | 0 |
| Trick, M. | 0 | 5 | 0 |
| Williams, H. E. | 0 | 10 | 6 |
| Williams, J. T. | 0 | 10 | 6 |
| Yorath, C. | 0 | 5 | 0 |

### Swindon.

| | | | |
|---|---|---|---|
| Green, John | 0 | 5 | 0 |

### Swineshead.

| | | | |
|---|---|---|---|
| Steeper, S. | 0 | 5 | 0 |

### Sydney (N.S.W.).

| | | | |
|---|---|---|---|
| Sloper, F. E. | 0 | 4 | 6 |

### Syston.

| | | | |
|---|---|---|---|
| Shakespeare, W. | 0 | 2 | 6 |

### Tarporley.

| | | | |
|---|---|---|---|
| Aston, A. V. | 0 | 5 | 0 |

### Taunton.

| | | | |
|---|---|---|---|
| Short, G. W. | 0 | 2 | 6 |

### Tavistock.

| | | | |
|---|---|---|---|
| Doble, H. T. | 0 | 5 | 0 |
| Doble, R. D. | 0 | 5 | 0 |
| Gill, William | 0 | 5 | 0 |

### Teddington.

| | | | |
|---|---|---|---|
| Peirson, H. S. | 0 | 10 | 0 |
| Stacey, P. | 0 | 5 | 0 |

### Teignmouth.

| | | | |
|---|---|---|---|
| Evans, Joseph J. O. | 0 | 5 | 0 |
| Maunder, William | 0 | 5 | 0 |
| Silk, E. | 0 | 5 | 0 |
| Wills, A. G. | 0 | 5 | 0 |

### Tenbury.

| | | | |
|---|---|---|---|
| Slade, John | 0 | 10 | 6 |

### Tenby.

| | £ | s. | d. |
|---|---|---|---|
| Davies, Moses P. | 0 | 5 | 0 |
| James, George | 0 | 10 | 0 |

### Tenterden.

| | | | |
|---|---|---|---|
| Willsher, S. H. | 0 | 10 | 6 |

### Tewkesbury.

| | | | |
|---|---|---|---|
| Barlow, G. R. | 0 | 5 | 0 |
| Wilkes, D. T. (Bredon) | 0 | 2 | 6 |

### Thetford.

| | | | |
|---|---|---|---|
| Marshallsay, R. J. | 0 | 5 | 0 |

### Thirsk.

| | | | |
|---|---|---|---|
| Rose, T. | 0 | 2 | 6 |

### Thornaby-on-Tees.

| | | | |
|---|---|---|---|
| Bonchetti, T. A. | 0 | 5 | 0 |

### Thornhill (N.B.).

| | | | |
|---|---|---|---|
| Fingland, James | 0 | 5 | 0 |
| McNay, D. | 0 | 5 | 0 |

### Thrapston.

| | | | |
|---|---|---|---|
| Pars, R. C. | 1 | 1 | 0 |

### Thurso.

| | | | |
|---|---|---|---|
| Cumming, W. | 0 | 2 | 6 |

### Ticehurst.

| | | | |
|---|---|---|---|
| Corke, Edward | 0 | 10 | 6 |

### Titchfield.

| | | | |
|---|---|---|---|
| Smith, W. O. | 0 | 10 | 6 |

### Tiverton.

| | | | |
|---|---|---|---|
| Havill, P. W. | 0 | 2 | 6 |
| Rossiter, Thomas E. | 0 | 5 | 0 |
| Tritton, C. E. | 0 | 5 | 0 |

### Todmorden.

| | | | |
|---|---|---|---|
| Lovatt, H. P. | 0 | 5 | 0 |

### Tonypandy.

| | | | |
|---|---|---|---|
| Thomas, J. | 0 | 5 | 0 |

### Topsham.

| | | | |
|---|---|---|---|
| Ellis, Frederick | 0 | 2 | 6 |

### Torpoint.

| | | | |
|---|---|---|---|
| Perkins, S. A. | 0 | 5 | 0 |

### Torquay.

| | | | |
|---|---|---|---|
| Bathe, William | 0 | 5 | 0 |
| Bridgman, William Louis | 0 | 5 | 0 |
| Cocks, John W. | 0 | 5 | 0 |
| Davies, J. | 0 | 5 | 0 |
| Guyer, James B. | 0 | 10 | 6 |
| Holloway, E. A. | 0 | 5 | 0 |
| Knight, Benjamin | 0 | 5 | 0 |
| Moon, G. W. | 0 | 5 | 0 |
| Newlyn, J. | 0 | 5 | 0 |
| Rawling, W. J. | 0 | 5 | 0 |
| Shapley, Charles | 0 | 10 | 6 |
| Slomau, F. | 0 | 2 | 6 |
| Sloman, Richard | 0 | 10 | 6 |
| Taylor, John | 0 | 10 | 6 |
| Temple, C. H. | 0 | 5 | 0 |
| Tomlin, I. P. | 0 | 5 | 0 |
| Waymouth, T. S. | 0 | 5 | 0 |

### Torrington.

| | | | |
|---|---|---|---|
| Griffiths, J. A. | 0 | 5 | 0 |

### Totnes.

| | | | |
|---|---|---|---|
| Cooke, E. H. | 0 | 2 | 6 |
| Foot, W. R. W. | 0 | 5 | 0 |
| Morse, C. H. Stafford | 0 | 5 | 0 |

### Tottenham.

| | | | |
|---|---|---|---|
| Bently, W. J. | 0 | 10 | 6 |
| MacCrindle, T. | 1 | 1 | 0 |
| Miller, C. B. | 0 | 5 | 0 |
| Tanner, A. E. | 1 | 1 | 0 |

### Tranent.

| | | | |
|---|---|---|---|
| Ness, T. | 0 | 5 | 0 |

### Tredegar.

| | | | |
|---|---|---|---|
| Phillips, Charles L. | 0 | 5 | 0 |

### Treherbert.

| | | | |
|---|---|---|---|
| Richards, T. | 0 | 5 | 0 |

### Treorchy (Pontypridd).

| | | | |
|---|---|---|---|
| Prothero, G. R. | 0 | 2 | 6 |

### Truro.

| | £ | s. | d. |
|---|---|---|---|
| Anstey, J. U. | 0 | 5 | 0 |
| Feaver, Samuel | 0 | 10 | 6 |
| James, Hamilton | 0 | 5 | 0 |
| Percy, Thomas B. | 0 | 10 | 0 |

### Tunbridge.

| | | | |
|---|---|---|---|
| Millidge, Thomas E. | 0 | 10 | 6 |
| Wardley, S. F. | 0 | 10 | 6 |

### Tunbridge Wells.

| | | | |
|---|---|---|---|
| Arnold, Spencer | 0 | 10 | 6 |
| Batting, Thomas G. | 0 | 10 | 6 |
| Carter, T. | 0 | 2 | 6 |
| Chapman, F. | 0 | 10 | 6 |
| Cheverton, George | 1 | 1 | 0 |
| Dodge, E. | 0 | 5 | 0 |
| Dunkley and Rogers | 1 | 1 | 0 |
| Hart, J. | 0 | 10 | 6 |
| Howard, Richard | 1 | 10 | 6 |
| Nicholson, A. | 0 | 10 | 6 |
| Sells, Robert J. | 0 | 10 | 6 |
| Thompson, G. A. | 0 | 10 | 0 |
| Whitrow, Benjamin | 1 | 1 | 0 |
| Williams, James | 0 | 10 | 6 |

### Tunstall.

| | | | |
|---|---|---|---|
| Viggars, G. D. | 0 | 5 | 0 |

### Tutbury.

| | | | |
|---|---|---|---|
| Green, Isaac | 0 | 5 | 0 |

### Twickenham.

| | | | |
|---|---|---|---|
| Alexander, William | 0 | 5 | 0 |
| Bishop, Thomas | 1 | 1 | 0 |
| Davies, O. T. | 0 | 5 | 0 |
| Peake, Henry F. | 0 | 5 | 0 |
| Shelley, Henry | 0 | 10 | 6 |
| Taylor, J. J. | 0 | 5 | 0 |

### Uckfield.

| | | | |
|---|---|---|---|
| Farr, E. H. | 0 | 10 | 6 |

### Ulverston.

| | | | |
|---|---|---|---|
| Willan, Robert | 0 | 10 | 6 |

### Unst (N.B.)

| | | | |
|---|---|---|---|
| Sutherland, A. | 0 | 2 | 6 |

### Upton-on-Severn.

| | | | |
|---|---|---|---|
| Cooper, W. E. | 0 | 2 | 6 |
| Gibbs, John | 0 | 10 | 6 |

### Urmston.

| | | | |
|---|---|---|---|
| Duncalfe, Richard | 0 | 5 | 0 |

### Usk (Mon.)

| | | | |
|---|---|---|---|
| Ault, J. | 0 | 5 | 0 |

### Uttoxeter.

| | | | |
|---|---|---|---|
| Woodward, H. | 1 | 1 | 0 |
| Woolrich, Charles B. | 0 | 10 | 6 |

### Uxbridge.

| | | | |
|---|---|---|---|
| Perfect, E. G. | 0 | 2 | 6 |

### Ventnor (Isle of Wight).

| | | | |
|---|---|---|---|
| Fitt, C. H. C. | 0 | 5 | 0 |
| Littlefield, J. W. | 1 | 1 | 0 |
| Nicholls, A. L. | 0 | 2 | 6 |
| Smith, C. A. | 1 | 1 | 0 |
| Weston, Charles | 1 | 1 | 0 |
| Withers, J. T. | 0 | 2 | 6 |

### Wadebridge.

| | | | |
|---|---|---|---|
| Philp, J. | 0 | 5 | 0 |

### Wainfleet.

| | | | |
|---|---|---|---|
| Huggins, R. B. | 1 | 0 | 0 |

### Wakefield.

| | | | |
|---|---|---|---|
| Cardwell, James | 0 | 5 | 0 |
| Chaplin, J. H. | 0 | 10 | 6 |
| Chaplin, John Lambert | 0 | 10 | 6 |
| Duffin, T. (1891-93) | 1 | 1 | 0 |
| Green, A. | 0 | 7 | 6 |
| Hick, M. B. | 0 | 10 | 6 |
| Job, C. F. | 0 | 5 | 0 |
| Pollard, William | 0 | 10 | 6 |
| Saville, George | 0 | 10 | 6 |
| Smith, G. E. | 0 | 10 | 6 |
| Wice, J. H. | 0 | 10 | 6 |

### Walkden.

| | | | |
|---|---|---|---|
| Watkinson, J. | 0 | 5 | 0 |

### Wallingford.

| | | | |
|---|---|---|---|
| Ashmall, George | 0 | 5 | 0 |
| Payne, Sidney | 1 | 1 | 0 |
| Upton, Eustace J. | 0 | 10 | 6 |

### Wallington.

| | £ | s. | d. |
|---|---|---|---|
| Wood, Edward | 0 | 10 | 6 |

### Walmer.

| | | | |
|---|---|---|---|
| Wood, Henry | 0 | 5 | 0 |

### Walsall.

| | | | |
|---|---|---|---|
| Barnes, G. A. | 0 | 5 | 0 |
| Bayley, C. | 0 | 10 | 6 |
| Elliott, E. M. | 0 | 10 | 6 |
| Elliott, George | 0 | 10 | 6 |
| Fast, J. P. | 0 | 5 | 0 |
| Grove and Son | 0 | 2 | 6 |
| Morris, J. O. | 0 | 2 | 6 |
| Shelley, E. S. | 0 | 10 | 0 |

### Walsham-le-Willows.

| | | | |
|---|---|---|---|
| Harrington, Arthur | 0 | 5 | 0 |

### Waltham Abbey.

| | | | |
|---|---|---|---|
| Griffiths, J. M. | 1 | 11 | 6 |
| Marshall, A. | 1 | 1 | 0 |

### Walthamstow.

| | | | |
|---|---|---|---|
| Saunders, A. | 0 | 5 | 0 |

### Walton-on-Thames.

| | | | |
|---|---|---|---|
| Power, William | 0 | 5 | 0 |

### Wantage.

| | | | |
|---|---|---|---|
| Candy, J. W. G. | 0 | 5 | 0 |
| Robins, H. | 0 | 2 | 6 |

### Ware.

| | | | |
|---|---|---|---|
| Medcalf, Benjamin | 0 | 10 | 6 |

### Wareham.

| | | | |
|---|---|---|---|
| Marshallsay, R. J. | 0 | 5 | 0 |
| Randall, Thomas | 0 | 10 | 6 |

### Warminster.

| | | | |
|---|---|---|---|
| Toone, J. V. | 0 | 10 | 6 |

### Warrington.

| | | | |
|---|---|---|---|
| Ashton, H. M. | 0 | 2 | 6 |
| Young, John Rymer | 1 | 1 | 0 |

### Warwick.

| | | | |
|---|---|---|---|
| Goff, T. S. | 0 | 2 | 6 |
| Holliday, J. | 0 | 10 | 6 |
| Mellor, J. G. | 0 | 5 | 0 |

### Watchet.

| | | | |
|---|---|---|---|
| Daymond, Samuel | 0 | 2 | 6 |

### Waterloo (Lancs.)

| | | | |
|---|---|---|---|
| Pearson, W. | 0 | 5 | 0 |
| Pheysey, R. | 0 | 10 | 6 |

### Watford.

| | | | |
|---|---|---|---|
| Chater, Edward M. | 1 | 1 | 0 |
| Chater, Matthew Taylor | 1 | 1 | 0 |
| Cottle, Alfred James | 0 | 5 | 0 |
| Hannaford, W. | 0 | 5 | 0 |
| Maries, H. D. | 0 | 5 | 0 |
| Parrott, W. S. | 0 | 10 | 6 |

### Watlington.

| | | | |
|---|---|---|---|
| Spyer, A. J. | 0 | 5 | 0 |

### Wath-upon-Dearne.

| | | | |
|---|---|---|---|
| Hick, Allan | 0 | 10 | 6 |

### Watton.

| | | | |
|---|---|---|---|
| Pechey, T. P. | 0 | 5 | 0 |
| Vincent, Lacey A. | 0 | 10 | 6 |

### Weaverham.

| | | | |
|---|---|---|---|
| Manifold, John J. | 0 | 5 | 0 |

### Wednesbury.

| | | | |
|---|---|---|---|
| Gittoes, Samuel J. | 0 | 10 | 6 |

### Wellingborough.

| | | | |
|---|---|---|---|
| Smith, John T. | 0 | 2 | 6 |
| Sykes, Harry | 0 | 5 | 0 |

### Wellington (Salop).

| | | | |
|---|---|---|---|
| Hensby, R. P. | 0 | 5 | 0 |

### Wellington (Somerset).

| | | | |
|---|---|---|---|
| Gregory, Walter | 0 | 5 | 0 |
| Windeatt, G. J. | 0 | 5 | 0 |

### Wells (Norfolk).

| | | | |
|---|---|---|---|
| Rump, Robert R. | 0 | 10 | 6 |

### Wells (Somerset).

| | £ | s. | d. |
|---|---|---|---|
| Slater, Jonathan | 0 | 5 | 0 |

### Welshpool.

| | | | |
|---|---|---|---|
| Griffiths, Thomas | 0 | 5 | 0 |

### Welton.

| | | | |
|---|---|---|---|
| Myers, George Henry | 0 | 5 | 0 |

### Wem.

| | | | |
|---|---|---|---|
| Porter, W. | 0 | 2 | 6 |

### West Burton (Yorks.)

| | | | |
|---|---|---|---|
| Pratt, W. | 0 | 5 | 0 |

### Westbury.

| | | | |
|---|---|---|---|
| Paine, Charles | 0 | 2 | 6 |

### West Cornforth (Co. Durham).

| | | | |
|---|---|---|---|
| Hunter, H. | 0 | 2 | 6 |

### Westgate-on-Sea.

| | | | |
|---|---|---|---|
| Bessant, Frederick R. | 0 | 10 | 6 |

### Westhoughton.

| | | | |
|---|---|---|---|
| Hope, T. | 0 | 5 | 0 |

### West Malling.

| | | | |
|---|---|---|---|
| Stedman, Richard B. | 0 | 5 | 0 |

### Weston-super-Mare.

| | | | |
|---|---|---|---|
| Cooper, John | 0 | 5 | 0 |
| Duckett, F. W. (Blackford) | 0 | 10 | 6 |
| Hall, E. | 0 | 5 | 0 |
| Parkes, Harry C. | 0 | 10 | 6 |
| Watson, J. W. | 0 | 5 | 0 |

### Weybridge.

| | | | |
|---|---|---|---|
| Clarke, W. E. | 0 | 5 | 0 |
| Griffin, Thomas | 0 | 10 | 6 |
| Kennett, J. N. | 0 | 10 | 6 |

### Weymouth.

| | | | |
|---|---|---|---|
| Gregory, W. | 0 | 5 | 0 |
| Groves, Thomas B. | 0 | 10 | 6 |
| Smith, E. M. | 0 | 10 | 0 |
| Stedman, S. S. | 0 | 5 | 0 |

### Whitby.

| | | | |
|---|---|---|---|
| Corner, Thomas B. | 0 | 10 | 6 |
| Frank, John | 1 | 1 | 0 |
| Stevenson, John | 0 | 10 | 6 |

### Whitchurch (Hants).

| | | | |
|---|---|---|---|
| Greatorex, E. J. | 0 | 10 | 6 |

### Whitehaven.

| | | | |
|---|---|---|---|
| Wilson and Kitchin | 1 | 1 | 0 |

### Whitley (Northumberland).

| | | | |
|---|---|---|---|
| Pattinson, H. | 0 | 2 | 6 |
| Whitehead, G. | 0 | 5 | 0 |

### Whitstable.

| | | | |
|---|---|---|---|
| Arrowsmith, G. W. T. | 0 | 10 | 6 |

### Wick (N.B.).

| | | | |
|---|---|---|---|
| Miller, Kenneth | 0 | 5 | 0 |

### Wickham Market.

| | | | |
|---|---|---|---|
| Last, A. J. | 0 | 2 | 6 |

### Wigan.

| | | | |
|---|---|---|---|
| Dawson, F. R. | 0 | 5 | 0 |
| Johnson, T. | 0 | 10 | 0 |
| Kellett, Richard E. | 0 | 5 | 0 |
| Phillips, Jonathan | 0 | 5 | 0 |

### Wimbledon.

| | | | |
|---|---|---|---|
| Blissett, F. H. | 0 | 2 | 6 |
| Butler, E. D. Barry | 0 | 10 | 6 |
| Dancey, R. | 0 | 5 | 0 |
| McDiarmid, F. | 0 | 10 | 6 |
| Pooley, John D. S. | 0 | 10 | 6 |
| Spencer, W. G. | 0 | 5 | 0 |

### Winchester.

| | | | |
|---|---|---|---|
| Barratt, F. J. | 0 | 5 | 0 |
| Chaston, A. E. | 0 | 5 | 0 |
| Knight, George E. Moses | 0 | 5 | 0 |
| Powell, Edward F. | 0 | 10 | 6 |

### Windsor.

| | | | |
|---|---|---|---|
| Blayney, W. C. | 0 | 2 | 6 |
| Collins, Henry G. | 0 | 5 | 0 |
| Grisbrook, Edward | 0 | 5 | 0 |
| Harmer, J. D. | 0 | 5 | 0 |
| Russell, Charles J. L. | 0 | 10 | 6 |
| Wood, Robert | 0 | 10 | 6 |

### Wingate.

| | £ | s. | d. |
|---|---|---|---|
| Cross, John T. | 0 | 10 | 0 |

### Wingham.

| | | | |
|---|---|---|---|
| Palmer, Henry B. | 0 | 5 | 0 |

### Winshill.

| | | | |
|---|---|---|---|
| Green, W. | 0 | 2 | 6 |

### Winslow.

| | | | |
|---|---|---|---|
| Parrett, Edward | 0 | 5 | 0 |

### Wisbeach.

| | | | |
|---|---|---|---|
| Hill, Major | 0 | 2 | 6 |

### Wishaw.

| | | | |
|---|---|---|---|
| Macfarlane, T. B. | 0 | 2 | 6 |

### Witham.

| | | | |
|---|---|---|---|
| Green, R. P. | 0 | 10 | 6 |

### Wokingham.

| | | | |
|---|---|---|---|
| Pearman, H. | 0 | 2 | 6 |
| Pickles, L. | 0 | 2 | 6 |
| Rednall, W. R. | 0 | 5 | 0 |

### Wolverhampton.

| | | | |
|---|---|---|---|
| Banks, C. H. | 0 | 5 | 0 |
| Beardmore, A. E. | 0 | 10 | 6 |
| Burnett, C. C. | 0 | 5 | 0 |
| Cannell, William | 0 | 10 | 6 |
| Fleeming, W. | 0 | 5 | 0 |
| Gascoyne, E. | 0 | 2 | 6 |
| Gibson, F. J. | 0 | 10 | 6 |
| Goodsell, P. G. | 0 | 5 | 0 |
| Hamp, John | 0 | 5 | 0 |
| Lowe, R. H. | 0 | 10 | 6 |
| Pratt, J. | 0 | 5 | 0 |
| Reade, Bros. and Co. | 0 | 10 | 6 |
| Robinson, J. | 0 | 5 | 0 |
| Stanway, Edward Thomas | 0 | 10 | 6 |
| Weaver, Alfred C. | 0 | 10 | 6 |
| Willcock, F. A. | 0 | 2 | 6 |

### Wolverton.

| | | | |
|---|---|---|---|
| Barton, W. | 0 | 5 | 0 |

### Woodbridge.

| | | | |
|---|---|---|---|
| Betts, A. S. | 0 | 5 | 0 |
| Betts and Son | 0 | 5 | 0 |

### Woolsthorpe (Lincs.).

| | | | |
|---|---|---|---|
| Welborn, G. | 0 | 2 | 6 |

### Woolston (Hants).

| | | | |
|---|---|---|---|
| Pell, John | 0 | 5 | 0 |

### Worcester.

| | | | |
|---|---|---|---|
| Acton, F. G. | 0 | 5 | 0 |
| Blunt, L. | 0 | 2 | 6 |
| Brickell, E. R. | 0 | 2 | 6 |
| Cooper, J. | 0 | 2 | 6 |
| Ferneley, Charles | 0 | 10 | 6 |
| George, Henry | 0 | 10 | 6 |
| Hall, Frederick J. | 0 | 5 | 0 |
| Hinks, John | 0 | 10 | 6 |
| Hogg, J. E. | 0 | 5 | 0 |
| Horniblow, F. H. | 0 | 2 | 6 |
| Horniblow, W. T. | 0 | 5 | 0 |
| Hurlston, F. | 0 | 2 | 6 |
| Judson, T. B. | 0 | 2 | 6 |
| Lunn, T. | 0 | 5 | 0 |
| Maxey, W. H. | 0 | 10 | 6 |
| Price, W. W. | 0 | 2 | 6 |
| Sawyer, E. B. | 0 | 2 | 6 |
| Silk, Thomas | 0 | 5 | 0 |
| Steward, John A. | 0 | 10 | 6 |
| Storm, E. B. | 0 | 5 | 0 |
| Turner, C. W. | 0 | 5 | 0 |
| Twinberrow, J. | 0 | 10 | 6 |
| Virgo, Charles | 1 | 1 | 0 |
| Williams, G. | 0 | 2 | 6 |
| Witherington, T. J. | 0 | 2 | 6 |

### Wordesley (Staffs.)

| | | | |
|---|---|---|---|
| Smith, S. | 0 | 5 | 0 |

### Workington.

| | | | |
|---|---|---|---|
| Birkett, F. J. | 0 | 2 | 6 |
| Mason, Joseph R. | 0 | 5 | 0 |

### Worksop.

| | £ | s. | d. |
|---|---|---|---|
| Baxter, George | 0 | 5 | 0 |
| Jones, George W. | 0 | 5 | 0 |
| Morris, T. | 1 | 0 | 0 |
| Pask, T. E. | 0 | 10 | 6 |

### Worthing.

| | £ | s. | d. |
|---|---|---|---|
| Aston, W. | 0 | 5 | 0 |
| Berry, H. J. | 0 | 5 | 0 |
| Burt, James | 0 | 5 | 0 |
| Cortis, A. B. | 0 | 10 | 6 |
| Frost, William | 0 | 10 | 6 |
| Gulliver, W. I. | 0 | 10 | 6 |

### Wrexham.

| | £ | s. | d. |
|---|---|---|---|
| Caldicott, C. G. | 0 | 5 | 0 |

### Yarmouth.

| | £ | s. | d. |
|---|---|---|---|
| Arthur, John | 0 | 5 | 0 |
| Clowes, John E. | 0 | 10 | 6 |
| Lane, F. J. | 0 | 5 | 0 |
| Mornement, H. J. | 0 | 5 | 0 |
| Oliver, J. R. | 0 | 2 | 6 |
| Palmer, H. | 0 | 5 | 0 |
| Poll, W. S. | 0 | 2 | 6 |
| Pratt, Edward J. | 0 | 10 | 6 |
| Williams, C. E. | 0 | 2 | 6 |
| Woodcock, T. J. | 0 | 2 | 6 |
| Wyles, W. | 1 | 1 | 0 |

### Yaxley.

| | £ | s. | d. |
|---|---|---|---|
| Farr, Joseph | 0 | 10 | 6 |

### Yeadon (Yorks.)

| | £ | s. | d. |
|---|---|---|---|
| Blatchley, Thomas | 0 | 10 | 6 |
| Galloway, W. H. | 0 | 2 | 6 |

### Yeovil.

| | £ | s. | d. |
|---|---|---|---|
| Francis, J. | 0 | 5 | 0 |
| Gatward, O. | 0 | 10 | 6 |
| Helliar, E. | 0 | 5 | 0 |
| Johnson, A. K. C. | 0 | 2 | 6 |
| Woodliffe, H. G. | 0 | 2 | 6 |
| Wright, A. | 1 | 1 | 0 |

### York.

| | £ | s. | d. |
|---|---|---|---|
| Batty, Thomas | 0 | 10 | 6 |
| Coates, Henry | 0 | 5 | 0 |
| Grierson, G. A. | 0 | 10 | 6 |
| Lupton, J. A. | 0 | 2 | 6 |
| Parker, Thomas | 0 | 10 | 6 |
| Roebuck, A. | 0 | 5 | 0 |
| Saville, John | 1 | 1 | 0 |
| Sowray, J. | 0 | 5 | 0 |
| Wisker, R. H. | 0 | 2 | 6 |

### Zeehan (Tasmania).

| | £ | s. | d. |
|---|---|---|---|
| Davies, E. C. J. | 0 | 10 | 6 |

---

## ANONYMOUS SUBSCRIPTIONS.

| | £ | s. | d. |
|---|---|---|---|
| S. J. B. | 2 | 2 | 0 |
| A. H. | 0 | 5 | 0 |
| C. E. C. M. | 0 | 5 | 0 |
| Sympathizer | 0 | 10 | 6 |
| Anonymous | 0 | 11 | 6 |
| T. M. J. | 0 | 2 | 6 |
| Anonymous | 0 | 5 | 0 |

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## SUBSCRIBERS TO THE BENEVOLENT FUND DURING 1893 (SINCE DECEASED).

| | | £ | s. | d. |
|---|---|---|---|---|
| Allen, George | Ampthill | 1 | 1 | 0 |
| Atkinson, Stephen | Doncaster | 0 | 10 | 6 |
| Bell, John | Carlisle | 0 | 5 | 0 |
| Bowles, W. J. | London | 0 | 10 | 6 |
| Cole, Frederick | Congleton | 0 | 2 | 6 |
| Cooper, F. A. | Cockermouth | 0 | 2 | 6 |
| Davies, R. H. | London | 1 | 1 | 0 |
| Elsey, Charles | Maldon | 0 | 5 | 0 |
| Francis, George Baggett | London | 1 | 1 | 0 |
| Fuge, Harry D. | Cambridge | 0 | 5 | 0 |
| Glen, Robert | Glasgow | 0 | 5 | 0 |
| Green, F. | Bournemouth | 0 | 2 | 6 |
| Hughes, Evan | London | 0 | 10 | 6 |
| Lescher, Joseph S. | London | 1 | 1 | 0 |
| Lewis, Thomas | London | 0 | 2 | 6 |
| Myers, George | Hull | 0 | 10 | 0 |
| Shrubsole, G. W. | Chester | 0 | 5 | 0 |
| Spencer, Thomas | Wokingham | 0 | 10 | 6 |
| Stevenson, William | Sheffield | 0 | 5 | 0 |
| Stewart, David | Kirkwall | 2 | 0 | 0 |
| Tomlinson, Charles K. | Lincoln | 1 | 1 | 0 |
| Tully, John | East Grinstead | 0 | 2 | 6 |
| Ward, Benj. | Newcastle-on-Tyne | 0 | 5 | 0 |
| Weedon, Joseph | Crawley | 0 | 5 | 0 |
| Wilson, Isaac | Oswaldtwistle | 0 | 5 | 0 |
| Woodland, John | London | 1 | 1 | 0 |

## "THE MONTH."

**Aconitine.** Freund and Beck have arrived at results in reference to the constitution of this base which introduce fresh discrepancies. It is stated that the investigation was commenced by Freund in 1891, and afterwards discontinued for a time in consequence of his learning that A. Ehrenberg was engaged upon the same inquiry. The chief points to which attention is directed are the formula of aconitine and the products of its alteration. The results obtained by the authors in the analysis of the base approximate to the values calculated from Wright's formula for apoaconitine, $C_{33}H_{43}NO_{11}$, but they prefer to adopt a formula differing from those arrived at by Wright and by Dunstan chiefly in containing an additional atom of carbon, either $C_{34}H_{45}NO_{11}$, or $C_{34}H_{47}NO_{11}$, because it is more in accordance with the data obtained by analysis of the salts and with the products of alteration. By long-continued boiling, Ehrenberg and Purfürst obtained from aconitine a crystalline product which they regarded as a mixture of two bases in the form of benzoates. Freund and Beck find that it is an individual substance, melting at 202°–203°, for the basic constituent of which they give the formula $C_{32}H_{45}NO_{10}$, and they represent its formation from aconitine by the following equation :—

$$\left.\begin{matrix} C_{34}H_{47}NO_{11} \\ H_2O \end{matrix}\right\} = \left\{\begin{matrix} CH_3{\cdot}COOH \\ C_{32}H_{45}NO_{10} \end{matrix}\right.$$

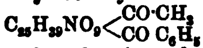
and they refer to the formation of acetic acid as having been already indicated by Ehrenberg and Purfürst (*J. p. Ch.*, xlv., 606). From examination of the amorphous base thus formed, of its crystalline benzoate, hydrobromide, and hydrochloride, they infer that it is identical with the substance to which Dunstan gave the name of "isaconitine," but they state that its composition is not correctly represented by the formula $C_{33}H_{45}NO_{12}$, and that it is not an isomer of aconitine, but probably the substance to which Wright assigned the formula $C_{31}H_{45}NO_{10}$, under the name of "picroaconitine." As the identity of isaconitine with that base has been established, Freund and Beck consider that the base they have obtained from aconitine by elimination of acetyl is picroaconitine, and they propose to revert to that name, altering Wright's formula to $C_{32}H_{45}NO_{10}$. The attempt to reproduce aconitine by acetylation of picroaconitine has hitherto been unsuccessful, the product being a crystalline substance of a different nature. The benzoic acid in the salt resulting from the hydrolysis of aconitine is attributed to another simultaneous mode of alteration, represented by the equation—

$$\left.\begin{matrix} C_{34}H_{47}NO_{11} \\ H_2O \end{matrix}\right\} = \left\{\begin{matrix} C_6H_5.COOH \\ C_{27}H_{43}NO_{10} \end{matrix}\right.$$

The other product of this change has not been isolated, as it appears to hydrolyse and readily break up into acetic acid and the compound $C_{25}H_{41}NO_9$, which is also stated to be produced by the action of boiling alcoholic potash upon picroaconitine, as shown by the equation—

$$\left.\begin{matrix} C_{32}H_{45}NO_{10} \\ H_2O \end{matrix}\right\} = \left\{\begin{matrix} C_6H_5.COOH \\ C_{25}H_{41}NO_9 \end{matrix}\right.$$

From the characters of this base it is considered by the authors to be identical with the substance to which Wright gave the name of aconine, but they state that the formulæ given by him, and subsequently by Dunstan, do not correctly represent its composition. The general result arrived at by Freund and Beck is that aconitine is represented by the formula $C_{34}H_{47}NO_{11}$, and that its constitution is acetyl-benzoyl-aconine—



$$C_{25}H_{39}NO_9 \left\langle \begin{matrix} CO{\cdot}CH_3 \\ CO\,C_6H_5 \end{matrix} \right.$$

The authors state that they intend shortly to publish a more extended account of their investigation, and they hope it may give rise to a discussion that will clear up the differences between their results and those obtained by Dunstan and his colleagues (*Berichte*, xxvii., 433).

In connection with this interesting subject there is a communication from Professor Dunstan at page 735.

**Etherification.** In the course of experiments on the alkyl esters of sulphonic acids, F. Krafft and A. Roos have observed that, by mixing sulphochlorides with the alcohols of the methyl series, sulphonic alkyl esters are formed, as, for instance, when naphtalin sulphochloride is mixed with ethyl alcohol. In the cold the ethyl ester of naphtalin sulphonic acid is formed according to the following equation :—

$$\left.\begin{matrix} C_{10}H_7{\cdot}SO_2Cl \\ HO{\cdot}C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_{10}H_7{\cdot}SO_2{\cdot}OC_2H_5 \\ HCl \end{matrix}\right.$$

On applying heat sufficiently long the product contains only free sulphonic acid and no ester. By heating a mixture of naphtalin sulphochloride and ethyl alcohol in a closed tube for several hours to 130°–135°, a layer of liquid was separated over the sulphonic acid, which distilled at 35°, and was found to be ethyl ether, the secondary change being represented by the following equation :—

$$\left.\begin{matrix} C_{10}H_7{\cdot}SO_2OC_2H_5 \\ HO{\cdot}C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_{10}H_7{\cdot}SO_2\,OH \\ C_2H_5{\cdot}O\,C_2H_5 \end{matrix}\right.$$

A mixture of the ethyl ester of naphtalin sulphonic acid with excess of alcohol, heated in the same manner, gave the same result. It was found that the free sulphonic acid had taken up a molecule of water, and hence it was inferred that the anhydrous sulphonic acid, $C_{10}H_7{\cdot}SO_3H$, first formed had exercised a dehydrating influence upon the alcohol so as to form ether, and in an experiment with the anhydrous sulphonic acid it was found that the reaction took place according to the equation—

$$\left.\begin{matrix} C_{10}H_7{\cdot}SO_3H \\ HO\,C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_{10}H_7{\cdot}SO_3{\cdot}C_2H_5 \\ H_2O \end{matrix}\right.$$

$$\left.\begin{matrix} C_{10}H_7{\cdot}SO_3{\cdot}C_2H_5 \\ HO{\cdot}C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_{10}H_7{\cdot}SO_3H \\ C_2H_5{\cdot}O{\cdot}C_2H_5. \end{matrix}\right.$$

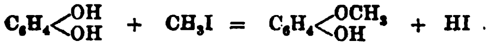
The action of the sulpho acid in this instance is similar to that of sulphuric acid in the formation of ether. In fact, the production of ether may be carried out to any extent by means of aromatic sulphonic acids in a continuous manner. By allowing alcohol to flow into sulphonic acid heated to 135°–145°, a distillate consisting of ether and water is obtained for an almost unlimited length of time, the sulphonic acid being continually regenerated and sufficiently dehydrated to effect the etherification of the alcohol added. When benzene sulphonic acid is employed the formation of ether takes place in two stages :—

1. $$\left.\begin{matrix} C_6H_5{\cdot}SO_2{\cdot}OH \\ HO{\cdot}C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_6H_5{\cdot}SO_2{\cdot}OC_2H_5 \\ H_2O \end{matrix}\right.$$

2. $$\left.\begin{matrix} C_6H_5{\cdot}SO_2{\cdot}OC_2H_5 \\ HO{\cdot}C_2H_5 \end{matrix}\right\} = \left\{\begin{matrix} C_6H_5{\cdot}SO_2{\cdot}OH \\ C_2H_5{\cdot}O{\cdot}C_2H_5 \end{matrix}\right.$$

(*Berichte*, xxvi., 2823, 2829).

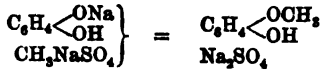
**Guaiacol.** This constituent of beechwood creasote was formerly described as a liquid until Behal and Choay obtained it in a solid crystalline state (*Pharm. Journ.*, lii., 805). It is now prepared synthetically by the reaction of methyl iodide with pyrocatechin—



$$C_6H_4<^{OH}_{OH} + CH_3I = C_6H_4<^{OCH_3}_{OH} + HI$$

Merck (*Bericht*, 1893) describes the product as melting at 33° C. and boiling at 205° C. A one per cent. alcoholic solution mixed with a few drops of two per cent. solution of ferric chloride and dilute hydrochloric acid becomes immediately blue, then green and yellow. The amount of guaiacol in the commercial article known by this name does not appear to be more than about 30 per cent.

**Preparation of Guaiacol.** By fractional distillation of commercial guaiacol the portion passing over between 200° and 205° is a colourless refractive liquid, which still contains an admixture of cresols. Guaiacol may, however, be obtained chemically pure by heating equal molecular proportions of pyrocatechin, the sodium salt of methyl sulphuric acid, and caustic soda. The reaction taking place is represented by the following equation:—



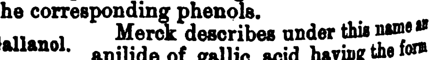
$$\left.\begin{matrix} C_6H_4<^{ONa}_{OH} \\ CH_3NaSO_4 \end{matrix}\right\} = \begin{matrix} C_6H_4<^{OCH_3}_{OH} \\ Na_2SO_4 \end{matrix}$$

Thus prepared, guaiacol is a white crystallisable substance, melting at 28°·5 and boiling at 205°. Hitherto the production of pyrocatechin has been too costly for practical application of this method, but it is now obtainable from derivatives of benzene, or toluene, as the other isomeric dioxybenzenes, resorcin, and hydroquinone have been obtained. By acting upon paraoxybenzoic acid—prepared by treating sodium phenol with carbonic acid—with bromine it is converted into bromoparaoxybenzoic acid, the bromine taking the ortho position relatively to the hydroxyl group. On melting this product with caustic soda, sodium pyrocatechin is formed, which is the material required for the preparation of guaiacol. Another method is that of Baum, who starts with metaoxybenzoic acid obtained from chlorinated toluene. The mixture of benzal chloride and benzene trichloride is heated under pressure with lime, and thus the benzal chloride is converted into benzaldehyd, and the benzene trichloride into benzoic acid. By treatment with sulphuric acid metasulphobenzoic acid is formed, and by melting that with alkali it is converted into metaoxybenzoic acid, the sulpho group being replaced by a hydroxyl group. By dissolving the metaoxybenzoic acid in carbon tetrachloride and adding bromine, parabrom-metaoxybenzoic acid is formed, and by heating this under pressure with caustic soda the sodium salt of protocatechuic acid is formed, which by further heating passes into sodium pyrocatechin. According to a third method of Baum's, alpha-phenol-disulphonic acid is melted with caustic soda, and the pyrocatechin sulphonic acid so produced is converted into pyrocatechin by heating with dilute mineral acids. Chemically pure guaiacol is described by Seifert as having a melting point of 32°. It retains the liquid condition at -2°, but immediately solidifies when a crystal is dropped in, the temperature rising to 27°. The specific gravity of guaiacol in a state of superfusion is 1·149 at 15°, and by the addition of a few drop of water or alcohol it retains the liquid state longe The boiling point is 204°-205°. Liquid guaiac mixed with twice its volume of pure sulphu acid gives a colourless solution. Mixed with a equal volume of caustic soda (sp. gr. 1·3) it forms a clear solution, which rapidly solidifies to crystalline mass. It mixes with twice its volum of glycerin (sp. gr. 1·19) without alteration volume, and dissolves in eight times its volume o petroleum spirit, while ordinary commercia guaiacol requires only four times its volume for solution (*Pharm. Centralh.*, xxxv., 97).

**Aluminium Boro-formate.** Martenson suggests the use of this salt—readily soluble in water—in place of alumnol and other analogous preparations, as being of a milder nature, antiseptic in its action, and well adapted for application to the throat (*Pharm. Zeitschr. Russland*, 1894, xxxiii., 46).

**Iodocresol.** Some iodine compounds of a new class, characterised by their capability of crystallising, and freedom from colour or smell, have been obtained by the firm of Bayer and Co. by operating upon phenols in dilute solution with limited proportions of caustic soda or alkaline carbonate. A solution of *o*-oxy-*p*-toluylic acid (*m*-cresotinic acid) in 1½ mol. of alkaline carbonate or 3 mol. of caustic alkali yields, when acted upon with iodine, triiodo cresol, $C_6HI_3{\cdot}CH_3{\cdot}OH$, which is a substance sparingly soluble in alcohol or petroleum spirit, readily soluble in ether, benzene, chloroform, or fat oils.

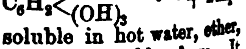
**Carbonic Esters of Pyrocatechin and its Alkyl Ether.** These compounds are obtained by v. Heyden by acting on pyrocatechin, its monoalkyl ether, or the methyl ether of homopyrocatechin with phosgen under pressure and in presence of an indifferent solvent, such as benzene—



$$\left.\begin{matrix} 2C_6H_4{\cdot}OH{\cdot}OC_2H_5 \\ COCl_2 \end{matrix}\right\} = \left\{\begin{matrix} CO(OC_6H_4O{\cdot}C_2H_5)_2 \\ 2HCl \end{matrix}\right.$$

The substances thus obtained are colourless, insoluble in water, soluble in alcohol or ether, and are distinguished from free phenols by their neutral reaction, the absence of corrosive action on the skin, and of taste or smell. They are, therefore, susceptible of useful application medicinally, as they are decomposed in the organism with elimination of the corresponding phenols.

**Gallanol.** Merck describes under this name an anilide of gallic acid having the form of colourless crystals, with a bitter taste,



$$C_6H_2<^{CO.NHC_6H_5}_{(OH)_3} + 2H_2O$$

melting at 205°, and soluble in hot water, ether, or alcohol, insoluble in benzene or chloroform. It has been used with advantage in some forms of skin disease in place of chrysophanic acid or pyrogallol (*Bericht*, 1893, p. 54).

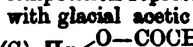
**Glycerin Phosphoric Acid.** Pasquali's observation, that lecithin—the most important phosphoretted constituent of the food—is split up during the process of digestion into choline and glycero-phosphoric acid, has led Merck to prepare this acid and its calcium salt for medical use, as offering phosphorus in the form most suitable for assimilation. The acid is a slightly yellowish, oily, liquid, inodorous, and soluble in water or alcohol. Its composition is represented by the formula $(HO)_2PO.O.C_3H_5(OH_2)$. The calcium salt, $CaC_3H_7PO_6$, is a white, crystalline powder, readily soluble in cold water, but almost insoluble in boiling water, in consequence of which the water solution becomes turbid when heated (*Bericht*, 1893, p. 10).

**Action of Sodium upon Water.** The cause of the violent explosion taking place when water is decomposed by sodium has not been clearly ascertained. As the result of some inquiry into this subject, M. Rosenfeld has come to the conclusion that a compound of sodium and hydrogen is formed, the sudden dissociation of which is the cause of the explosion (*Journ. prakt. Chem.*, xlviii., 599).

**Isoborneol.** By heating camphor with a mixture of acetic acid and a small quantity of mineral acid, J. Bertram and H. Walbaum have obtained an ester having the formula $CH_3COOC_{10}H_{17}$, and by heating it with alcoholic potash they obtained a solid alcohol, $C_{10}H_{18}O$. It closely resembles borneol, but is not identical with it. From solution in petroleum spirit it crystallises in thin feathery laminæ, is readily soluble in alcohol, ether, chloroform, or benzene, and insoluble in water. It melts at 212°, and sublimes readily. It combines with chloral or bromal, forming well defined addition products similar to those obtained by Haller and Minguin with borneol. By treatment with dehydrating agents, such as zinc chloride, isoborneol is readily convertible, with separation of water, into camphene. Boiled with nitric acid, or by the action of chromic acid, isoborneol is converted into a ketone, $C_{10}H_{16}O$, which cannot be distinguished from ordinary laurel camphor. By reduction with sodium this camphor yields a mixture of borneol and isoborneol, just as laurel camphor does, and both these forms of borneol yield by oxidation the same camphor. The borneol of commerce was ascertained to be a mixture of borneol and isoborneol. The above described conversion of camphor into an acetic ester and then into isoborneol is turned to account for the detection of camphor in essential oils. In this way the authors have found camphor in citronella oil, ginger oil, kesso oil from Japanese valerian root, and oil of camphor. When pinene is present in large amount some difficulty arises in the application of this method from the hydration of this terpene to terpineol, which has about the same boiling point as isoborneol, and is capable of holding in solution a large proportion of isoborneol (*Journ. prakt. Chem.* 49, 15).

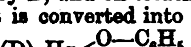
**Mercurial Phenol.** Desesquelle states that, on adding mercuric chloride solution to an alkaline solution of phenol in molecular proportions, a substance is obtained having the composition represented by A. By using a large excess of alkaline phenol solution the product has the composition represented by B, and on treating this with glacial acetic acid it is converted into C.

(A)



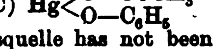
$$Hg<^{Cl}_{O-C_6H_5}$$

(B)



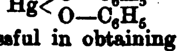
$$Hg<^{O-H}_{O-C_6H_5}$$

(C)



$$Hg<^{O-COCH_3}_{O-C_6H_5}$$

(D)



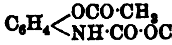
$$Hg<^{O-C_6H_5}_{O-C_6H_5}$$

Desesquelle has not been successful in obtaining a phenotate having the composition represented by the formula D.

**Ethylphenols.** Béhal and Choay find that the compound known as α-ethylphenol is identical with para-ethylphenol, which, however, has nothing in common with the compound described by Errera and Auer. Orthoethyl phenol has a higher boiling point, 202°–203°, than is usually attributed to it. Metaethylphenol is a liquid boiling at 214°, and has a density at 0° of 1·0403. (*Comp. rend.*, cxviii., 422).

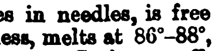
**Phenocol.** The melting point of the purified base in the hydrated condition is stated by Dr. Francesco Nicola to be 113° instead of 95°, as usually given, and the anhydrous base melts at 99°·5. When phenocol is heated somewhat above its melting point, ammonia is given off, and the residue dissolved in water gives a fine red violet colour when a few drops of ferric chloride solution are added. The hydrochloride, which has hitherto been described as anhydrous, crystallises with one molecule of water. Nicola confirms Fischer's statement that phenocol dissolves in 20 parts of water at 15°·5 to 16°. The salt melts with partial decomposition at 254°, beginning to cake together at 200°, and becoming slightly brown at 230°. The residue after melting, dissolved in water, and mixed with a drop of ferric chloride solution, gives an intense reddish violet colour, which is considered by Nicola to be a useful means of identification (*Annali di Chimica e di Farmacologia*, December, 1893).

**Oxyphenyl urethanes.** Some two years ago A. Schneegans and Professor v. Mering, in studying the action of various alcohols and their derivatives, observed that the toxic effects and hypnotic action of the compounds differed according as they contained primary, secondary, or tertiary radicals. Their activity was also greater in proportion to the molecular weight. Merck has followed up this observation by preparing compounds of para-amidophenol, and their physiological examination by Professor v. Mering has shown that two of them admit of useful therapeutic application. NEURODIN, $C_{11}H_{13}NO_4$, is acetyl para-oxyphenyl urethane—



$$C_6H_4<^{OCO\cdot CH_3}_{NH\cdot CO\cdot OC_2H_5}$$

It has the form of colourless crystals, free from odour, melting at 87° C., and slightly soluble in water. It is described as possessing marked anti-neuralgic properties, being prompt in its action. THERMODIN, $C_{13}H_{17}NO_4$, is acetyl para-ethoxyphenyl urethane—



$$C_6H_4<^{O\cdot C_2H_5}_{NCOCH_3\cdot CO\cdot OC_2H_5}$$

It crystallises in needles, is free from smell and almost tasteless, melts at 86°–88°, and is sparingly soluble in water. It is an efficient antipyretic, operating within an hour, and has been found useful in cases of influenza (*Merck's Bericht*, 1893).

**Mineral Acids in Vinegar.** The *Chemiker Zeitung* recommends the following test. A cubic centimetre of the vinegar is placed in a capsule and one drop of an alcoholic solution of rosaniline hydrochloride (25 gr. fuchsin in 100 C.c. 90 per cent. alcohol) added. If the vinegar is pure the liquid will retain a reddish violet colour; if mineral acids are present, even to the extent of one per cent., the liquid becomes dirty yellow. The characteristic colour of fuchsin is again restored after neutralising with alkali.

**Simple Method of Sterilising Water.** M. Traube states that by mixing water with chloride of lime in the proportion of half a milligramme to 100 C.c., all micro-organisms present are destroyed within the space of two hours. Water abounding in bacteria, after having been thus treated, will be found perfectly sterile when tested in suitable culture media. The amount of active chlorine present is reduced within the two hours by about 9·1 per cent., and the remainder may be neutralised by the addition of sodium sulphite in sufficient amount. The addition of an excess would not be detrimental, as it would be soon converted into sulphate by the oxygen dissolved in the water. After treatment in this manner, water has a pure taste, and a perfectly neutral reaction. Whether pathogenic bacteria are completely destroyed by such treatment has not been exactly ascertained (*Zeitschr. Hygiene, etc.*, xvi., 149).

**Carbon Tetrachloride.** By warming a mixture of sulphur chloride and carbon disulphide with finely divided iron or a metallic chloride, such as ferric chloride, the reaction represented by the following equation takes place:—

$$\left.\begin{matrix}2S_2Cl_2\\ CS_2\end{matrix}\right\} = \left\{\begin{matrix}CCl_4\\ 6S\end{matrix}\right.$$

The liquid separated from the sulphur is subjected to fractional distillation. In the place of sulphur chloride the higher chlorinated compounds of sulphur may be used.

**Aseptic Hypodermic Solutions.** At a recent meeting of the *Société de Thérapeutique* a communication was made by Drs. Berlioz and Duflocq, in which they described the methods adopted by them for administering medicines subcutaneously without risk of septic poisoning. The solutions are prepared under conditions of absolute asepsis and preserved in tubes of yellow glass, containing from two to four cubic centimetres each. The neck of each tube is drawn out to a tapering point and, after filling, sterilisation is effected before closing in an autoclave or a vacuum apparatus, according to the volatility of the liquid. When required for use, the neck of the tube is broken off and the needle-point of the previously sterilised syringe is immediately introduced into the opening thus made. Full working details, with illustrations of the apparatus employed, are given by the authors (*Répertoire*, [3], vi., 49).

**Salicylic Esters of Monochlor Phenols.** Of the three isomeric forms of oxybenzoic acid, the ortho compound or salicylic acid is known to have the most decided antiseptic properties, while among the cresols the meta compound is the most powerful, and it was to be expected that the monochlorinated phenols would show similar differences. Karpow has, however, ascertained that the para compound is the most powerful of them. The salicylic esters of two monochlor phenols have been examined, with the result that the orthochlor salol (m. p. 53°) and parachlor salol (m. p. 71°) possess a much greater disinfecting power than salol. They are both colourless crystalline substances, insoluble in water, but readily soluble in alcohol or ether. The solutions give with ferric chloride a reddish-violet coloration (*Pharmaceut. Zeitung*, xxxix., 81).

**Chamberland Filter.** Guignolet finds that the filtering bougies used in this filter purify water, under a pressure of twenty metres, from all microbes during a period of six days, whilst only a limited number of organisms make their way through within twenty-seven days. The bougies are easily sterilised again in the cold and without taking the filter to pieces, by passing through successively solutions of potassium permanganate (1 in 1000) and sodium bisulphite, which totally destroy any organic matter in the pores of the filtering medium. It is recommended that these filters be cleaned on the surface by daily rubbing; that every week, or oftener if the water used be very impure, they should be sterilised by permanganate, as above; and that three or four times a year the two processes should be combined, the cold rubbing being followed by the application of stronger permanganate solution (5 in 1000), and solution of sodium bisulphite (1 in 20). Under these conditions the filters are said to act well for an indefinite period (*Moniteur de la Pharm.*, xliv., 1417).

**Preparation of Oxygen.** M. Delamotte recommends pharmacists to prepare oxygen for medicinal purposes by allowing water to fall intermittently and in small quantities on sodium peroxide, the reaction being checked when necessary by mixing the compound with an equal quantity of sand. This method is said to give a pure product in a brief time. Dr. Bardet prefers to add water to a mixture of fifty grammes of barium dioxide with sixty of potassium permanganate. The gas thus rapidly given off in the cold contains a little ozone, but is said to be sufficiently pure to be respired (*Répertoire*, [3], vi., 54).

**Action of Fluorides on Yeast.** E. Sorel—after referring to the results obtained by Effront (*ante*, p. 441), who showed that yeast cells could be gradually accustomed to the presence of large quantities of ammonium fluoride, and even develop more freely, as well as become capable of fermenting relatively larger proportions of sugar—describes some of the experiments performed by himself in the same direction. He finds that yeasts accustomed to live in a medium rich in hydrofluoric acid form new cells very slowly, but that when they are removed to a weaker medium their activity becomes very great, new cells forming at such a rate that it is impossible to count them. The activity seems to increase in proportion as the original medium was charged with aseptic matter. Further experiments proved that repeated treatment with increasing proportions of hydrofluoric acid failed to destroy the power of reproduction in the yeast cells (*Comp. rend.*, cxviii., 253).

**Artificial Diamonds.** H. Moissan deals with the results of his latest attempts to form diamonds artificially. Under various conditions he has been able to obtain a transparent black variety of carbon, certain specimens of which present a distinctly crystalline appearance. The density of these is between 3 and 3·5, they scratch the ruby, resist the action of potassium chlorate and fuming nitric acid, and burn in oxygen at a temperature near 900° to produce four times their weight of carbon dioxide, in all these respects according exactly with natural diamonds, which alone are known to possess similar properties (*Comp. rend.*, cxviii., 320).

**Chloroform.** Dr. E. R. Squibb, in a footnote to a paper on "Chloroform in 1893," refers to Brown's statement (*ante*, p. 321)—that pure chloroform to which 0·077 per cent. of alcohol had been added, when exposed in colourless glass to direct sunlight, began to decompose in fourteen to nineteen days, with alcohol still present in the chloroform—and states that, whilst not doubting this, his experience is that pure chloroform to which 0·625 per cent. of alcohol had been added, in ground-stoppered bottles of amber glass, has been kept for at least ten years without any trace of decomposition. It is also remarked that though it is true that properly purified chloroform is chemically the same whether it be made from alcohol, acetone, chloral, or other material, "the practical condition still remains that it is comparatively easy to properly purify chloroform from alcohol, while from other materials it is more difficult, and, therefore, less likely to be accomplished (*Ephemeris*, iv., 1431).

**Phenated Lime.** This preparation (*chaux phéniquée*) is said to be much used in Russia as a disinfectant. Lime, three parts, is well slaked with five or six parts of water; then gas tar, two parts, is added, little by little, the mass being well stirred during the operation. A yellowish-brown product results, which is mixed with water and used in the liquid form (*Journ. de Chir. d'Anvers*, through *Moniteur de la Pharm.*).

**Influence of Solvents on Germicides.** That the liquids employed as solvents of carbolic acid sometimes affect its properties as a germicide has been demonstrated by several writers since Koch alluded to the matter in 1881. Recent experiments by P. Lenti, of the University of Naples, have demonstrated that absolute alcohol completely neutralises the germicidal action of both corrosive sublimate and carbolic acid with regard to anthrax spores, and that a considerable proportion of water must be added before any germicidal action can then take place. Glycerin impedes the action of sublimate when less than forty per cent. of water is present, and of ten per cent. solutions of carbolic acid when they consist of less than eighty per cent. of water. Carbolic acid and lysol also lose their disinfecting property entirely when dissolved in olive oil. It would appear, therefore, that alcohol, glycerin, and fatty bodies are unsuitable ingredients of liquid disinfectants (*Rev. d'hygiène*, through *L'union pharm.*, xxxv., 58).

**New Boron Compounds.** Professor Michaelis has prepared diphenyl boron chloride, $(C_6H_5)_2BCl$, by heating in a sealed tube to 300°–320° the mono-phenyl compound, first obtained in 1879, with mercury diphenyl. When pure it is a thick, colourless liquid, fuming slightly in moist air. It decomposes upon heating with water, diphenyl boric acid resulting. The colourless or faintly yellow crystals of this acid melt at 264° and possess a very powerful and penetrating odour. The acid dissolves readily in alkalies, but can be readily extracted from solutions of the salts thus formed by organic solvents (*Berichte*).

**Compounds of the Citral Series.** F. Tiemann and F. W. Semmler describe the citral or geranial obtained from lemon oil or lemon grass oil as an aldehyde, having the composition $C_{10}H_{16}O$. It is nearly colourless, slightly soluble in water, but readily soluble in alcohol, ether, or chloroform. It is optically inactive. The optically inactive geraniol, $C_{10}H_{18}O$, is the alcohol corresponding to citral, and it is convertible into citral by oxidation with chromic acid, while it can be reproduced from citral by reduction with sodium. Optically active alcohols of the formula $C_{10}H_{18}O$ have been obtained by Eckart and Semmler—rhodinol, feebly lævo-rotatory, from rose oil; coriandrol, a dextro-rotatory unsaturated alcohol, from coriander oil; linalool, aurantiol, and lavendol from bergamot, petitgrain, and lavender oils; also nerolool, the lævo-rotatory unsaturated alcohol, from neroli oil. These optically active alcohols of the formula $C_{10}H_{18}O$ all yield citral by careful oxidation. When citral is oxidised, below 0 in acetic acid solution, with chromic acid it yields methyl heptylene ketone and a substituted glyceric acid, chiefly geranic acid, $C_{10}H_{16}O_2$, in the form of a colourless oil, readily soluble in alcohol, ether, benzene, or chloroform. By destructive distillation citral yields carbonic acid and a hydrocarbon, $C_9H_{16}$, geraniolene, of 0·757 specific gravity at 20°, boiling at 142°–143° (*Berichte*, xxvi., 2708).

**Constitution of Camphor.** C. Gillet is of opinion that none of the views hitherto put forward as to the constitution of camphor are sufficiently in accordance with its known characters. By condensation of acetone by means of acids or alkalies he has obtained two different forms of phorone analogous to camphor, but containing $CH_2$ less in the molecule, and Gillet regards camphor as a phorone in which one atom of hydrogen has been replaced by $CH_3$. By condensation of two molecules of acetone and one of methyl acetone he has obtained a substance which is crystallisable, capable of being sublimed, and has the appearance, as well as the smell, of camphor (*Apotheker Zeit.*, ix, 124).

**Sapotin.** This is the name given to a glucoside extracted by G. Michaud from the seed contained in the Sapodilla Plum, the fruit of *Achras Sapota*. This tree has a febrifrugal bark, and diuretic and aperient seeds. The glucoside was obtained in minute crystals, melting at 240°. In alcoholic solution they are lævogyre, $[\alpha]_D = 32·11$. Sapotin is very soluble in water, less so in alcohol, and insoluble in ether, benzene, or chloroform. Acetate of lead forms a gelatinous precipitate in an aqueous solution of the compound, the precipitate being soluble in excess of the reagent. The formula of sapotin is $C_{29}H_{52}O_{20}$, and when boiled with dilute sulphuric acid the compound decomposes, glucose and sapotiretin, $C_{17}H_{32}O_{10}$, being formed, the latter insoluble in water, but very soluble in alcohol (*Am. Chem. Journ.*, xiii., 572).

**Essence of Lemon.** V. Oliveri has examined the essential oil of *Citrus Limonum* and describes it, when freshly prepared, as neutral in reaction, not reducing ammoniated silver nitrate, of density 0·86 to 1·60, and having a specific rotatory power varying between $[\alpha]_D = + 69°·75$ and $72°·10$, at 16°. It oxidises in air, becoming faintly acid, and distils entirely with the vapour of water. By fractional distillation the oil was separated into three portions. The first (constituting one-fifteenth of the whole) passed over at 170°–170°·5, and consisted of limonene, $C_{10}H_{16}$; density at $0° = 0·8867$; $[\alpha]_D = + 66°·82$ at 16°. It formed a tetrabromide, $C_{10}H_{16}Br_4$, and a dichlorhydrate, $C_{10}H_{18}Cl_2$. The second fraction (nine-tenths of the total amount) distilled at 176°–178°, and also consisted of limonene; density 0·899; $[\alpha]_D = + 76°·75$. The third fraction distilled at 240°–242°, and is described as sesquilimonene, $C_{15}H_{24}$, a viscid liquid of density 0·9847, optically inactive. This constituted a very small proportion of the oil, and formed an uncrystallisable oily tetrabromide and a similar dichlorhydrate (*Gagg. chim. ital.*, through *Bull. Soc. Chim. de Paris*, [3], xii., 46).

**Ipecacuanha and Senega.** A. Andrée calls attention to an admixture of undulated ipecacuanha root (*Richardsonia scabra*), with senega root, in a parcel sent out by a New York house, the ipecacuanha being present in a notable proportion. The senega root is described as not presenting identical characters with the official article, being harder, more fibrous, and not possessing generally the keel by which the root is usually recognised. Portions of stem attached to the root were coloured violet. Andrée suggests that the roots may possibly be obtained from a distinct species of *Polygala*, growing in the same districts as the *Richardsonia*, and collected at the same time as the roots of the latter (*Apot. Zeit.*, ix., 23).

**Mercurialis Annua, L.** G. de Letter, of Brussels, considers that this plant, properly collected, dried, and preserved, constitutes an economical laxative medicine. Twenty to thirty grammes of the dried herb, in aqueous infusion, is suggested as a proper dose, or ten to twenty centigrammes of an alcoholic extract. A medical authority is also quoted, to the effect that a decoction of the fresh herb possesses both laxative and diuretic properties (*Journ. de Pharm. d'Anvers*, l., 30).

**Adulteration of Kousso.** Professor Arthur Meyer and Hendrik Sandlund have drawn attention to the difficulty that at present exists of procuring kousso in bundles, and point out the fact that an adulteration with male flowers can be more easily effected when the flowers are loose than when the whole inflorescence is packed in hanks. From an examination of commercial loose kousso, they have found that such an adueration actually takes place to the extent of as much as 12 per cent. These male flowers are unexpanded; the sepals of the outer calyx are distinguished from the corresponding organs of the female flowers by a thick covering of short unicellular hairs. Occasionally the female flowers develop stamens, in which, however, no pollen is formed. The presence, therefore, of sepals with dense short hairs, of pollen, and of the tissue of the filament in more than very small proportion, are sufficient to distinguish the male flower, either in the loose or powdered kousso (*Pharm. Zeit.*, No. 99, 1893).

**Kosin or Koussin.** Max Leichsenring has re-investigated kousso flowers, and isolated a crystalline inactive body, protokosin, and an amorphous, highly active substance, kosotoxin; from the latter a yellow crystalline inactive body, apparently identical with commercial kosin, could be obtained by boiling with hot baryta water, purifying, and crystallising. The author concludes that commercial kosin is not a natural constituent of kousso flowers, but is produced from one of the constituents during the process of isolation (*Archiv.*, ccxxxi., 50).

**False Sarsaparilla.** C. Hartwich describes a false sarsaparilla from Jamaica, which has recently made its appearance in Hamburg. It consisted of cylindrical pieces of root, measuring up to nineteen inches in length and three-sixteenths to three-quarters of an inch in thickness, and brown or greyish brown in colour. The larger pieces were covered with projections which proved to be small galls. The cortex of the root contained numerous schizo-lysigenous ducts, which were surrounded by a sclerenchymatous sheath, and in the earlier stages were filled with resin. The central column showed a very small pith, radial fibrovascular bundles, and numerous resin ducts. The root was identified by these characters as a *Philodendron*, but the species could not be determined (*Archiv.*, ccxxxi., 42)

**Extract of Logwood.** E. Donath finds that commercial extract of logwood contains a notable quantity of nitrogen in a soluble form, and that the ash is higher in proportion, and richer in chlorides and phosphates than it was in an extract prepared by himself. These differences he attributes to the sprinkling of the logwood with putrid urine during the process of fermentation to which it is subjected, in order to convert the hæmatoxylin into hæmatëin (*Chemiker Zeitung*, xviii., 277).

**East African Gum.** C. Hartwich reports upon a gum resembling tragacanth recently sent from East Africa. It differed from tragacanth in containing comparatively few pieces of the characteristic flattened shape of true tragacanth; the majority consisted of rounded or pear-shaped whitish masses; the gum swelled to a stiff jelly with two hundred times its weight of water, and was soluble only after prolonged boiling with much water. It appeared to consist mostly of bassorin, the formation of which began in the middle lamella, and proceeded to the primary and secondary deposits in the cell-wall. From the mode of formation of the gum, and the anatomical characters of the fragments of bark found in it, the conclusion was drawn that it was produced by a species of *Sterculia* (*Archiv.*, ccxxxi., 43).

**Russian Fir Tar.** This tar is obtained chiefly from *Pinus sylvestris* as a syrupy, reddish-brown liquid, of 1·085 sp. gr., containing an amount of acid varying from 2 to 5 per cent. The phenols it contains are guaiacol and its homologs (Nenki and O. Lieber, *Chem. Zeitung Report*, 18, 8).

**Aconitum Septentironale.** This plant closely resembles *Aconitum Lycoctonum*, but the flowers are blue or violet, sometimes white. It grows in Sweden and Norway, Northern Russia, and some parts of Austria. H. V. Rosendahl has obtained from the rhizomes three bases:—1. Lappaconitine, $C_{34}H_{48}N_2O_8$, in the form of hexagonal prisms, melting at 205°. A solution of the base in alcohol or ether has a reddish-violet fluorescence. When heated with caustic alkalies lappaconitine yields two other bases and an acid. 2. Septentrionaline, $C_{31}H_{48}N_2O_9$, amorphous, melting at 128°·9, very soluble in alcohol or ether, and in 58 parts of water; has a bitter taste, and local anæsthetic action. Alkalies convert it into two other bases and a crystallisable acid, which gives a bluish-violet colour with ferric chloride. 3. Cynoctonine, $C_{36}H_{55}N_2O_{13}$, amorphous, melting at 137°, readily soluble in water or alcohol, but only in 1373 parts of ether. Mixed with fuming nitric acid and evaporated the residue becomes blood-red on adding alcoholic solution of caustic potash. Lappaconitine is coloured yellowish-red by sulphovanadic acid, afterwards becoming green. Septentrionaline gives a cherry-red with furfurol sulphuric acid (*Apotheker Zeitung*, ix., 112).

**Pycnanthemum lanceolatum.** H. C. Barker has investigated the constituents of this plant, and found it to contain neither alkaloids, glucosides, starch, nor tannin, whilst but small quantities of inulin and sugar were noted. It yielded about 1·47 per cent. of ethereal oil, however, calculated on the air-dried material. This oil is described as yellow in colour, resembling that of pennyroyal in odour, and of specific gravity 0·9361 at 15° C. (*Am. Journ. Pharm.*, [4], xxiv., 65).

**Creasote Pills.** For obtaining very small creasote pills Fauel (*Rev. Pharm. de Gand*) recommends the use of a mass obtained by dissolving five parts of sugar in twenty-four of water and then adding eleven parts of gelatin. One part of this, used warm, is said to emulsify two parts of creasote, and by the addition of liquorice powder a convenient pill-mass may be obtained which contains a large proportion of the active ingredient. When creasote is prescribed in pilular form, together with tannin and iodoform, Violé (*Bull. de Pharm. de Bordeaux*) absorbs the first by means of animal charcoal, then adds the other ingredients, and finally masses the whole with turpentine. The charcoal is said to mask the taste of the creasote to some extent, and by rolling the pills in magnesia, silvering, or coating with tolu varnish it may be still further covered.

**Chloralose Poisoning.** Dr. P. W. Watson describes a case of poisoning by chloralose, which has been generally regarded as a perfectly safe hypnotic. Fortunately the effects were not fatal, but the administration of a second ten-grain dose to a lady within twenty-four hours of the first dose—which seemed to cause no ill effects—was succeeded by an attack of acute delirious mania. On recovering, the patient was extremely prostrate, and had no recollection of what had passed since taking the chloralose. The drug appeared to stimulate the heart's action, and it is suggested that caution should be observed in administering it in cases where chloral is distinctly contra-indicated (*Practitioner*, lii., 98).

**Electric Indicating Thermometer.** M. Barillé describes an ingenious application of electricity as an aid in preserving a constant temperature during laboratory operations. An ordinary mercurial thermometer has the upper half of the stem somewhat enlarged in diameter, the lower, narrow portion alone being graduated. A fine platinum wire (*a*) is sealed into the bottom of the bulb, so that one end projects into the mercury, and a similar wire (*b*) is fixed into the upper part of the stem, running the whole length of the thickened portion. A third platinum wire (*c*) extends from a point about one-third the distance down the narrow, graduated part of the stem, up past the free end of the second wire as far as the middle of the latter, round which it is then twisted in a spiral, whilst a steel needle to serve as an index is soldered to its extremity. Finally, the air in the upper part of the stem is replaced by orthotoluidine—which boils at 200°, freezes at -20°, and does not appreciably affect the mercury—the opening is sealed, and the thermometer fixed in a suitable copper frame, the lower part of which may readily be introduced into the openings in drying ovens, etc. A small permanent horseshoe magnet is next placed so that its poles are opposite the ends of the index, which it maintains in position by its attractive influence, so that the movable wire *c* becomes practically a prolongation of the fixed wire *b*, along which it slides by means of the spiral. By sliding this magnet up or down the side of the thermometer tube a corresponding movement of the wire *c* also takes place. The free extremities of the wires *a* and *b* are attached to binding screws, which are in turn connected with an electric bell and battery. Now, when the surrounding temperature is sufficiently high to expand the mercury until it comes in contact with the lower extremity of the wire *c*, the circuit is immediately closed and the bell rings; and by regulating the position of the permanent magnet, and consequently the steel index on the upper end of the wire *c*, it is possible to fix the maximum temperature at any point desired (*Comp. rend.*, cxviii., 246).

## THE PRODUCTION OF ACETIC ACID FROM ACONITINE.*

BY PROFESSOR DUNSTAN, F.R.S.,

*Director of the Research Laboratory of the Pharmaceutical Society.*

In the last number of the *Berichte* of the German Chemical Society, February 19, 1894, Herrn M. Freund and J. Beck state that they have found that aconitine loses acetic acid when it is hydrolysed, forming first the alkaloid "picraconitine," or "isaconitine" as we believed it to be when we isolated it from the plant. This fact has already been published by me and my colleagues in communications made to the Chemical Society of London on January 17, 1894, of which abstracts are given in the *Pharmaceutical Journal* of January 20, 1894, and also in the 'Proceedings of the Chemical Society' of January 27, 1894. We showed also that aconitine loses acetic acid when it is heated in the dry state. The obvious conclusion that aconitine must be acetylbenzoyl-aconine, and the so-called "isaconitine" benzoyl-aconine, though not stated in so many words in the abstracts, is given in the original papers which appear in the number of the *Journal of the Chemical Society* now being published. Being wholly unaware that Herr Freund was working at the subject, and that our conclusions were in danger of being forestalled, we had intended to delay giving a complete discussion of our results, and their bearing on the constitution of aconitine, until synthetical experiments now in progress had been completed.

It is surprising that Herr Freund should not allude to our observations on the production of acetic acid from aconitine, especially as they are recorded in the same number of the 'Proceedings of the Chemical Society' as that which contains the abstract of our paper on "Picraconitine," from which Herr Freund quotes. It is also to be regretted that Herr Freund did not inform us that he intended to work at this subject, since he must be aware that we have been occupied with this inquiry for some years past. It was to be expected that a chemist of Herr Freund's reputation would have recognised that chemical science is international, and that foreign workers are entitled to the same courtesy which he would be the last to deny to his own countrymen. We do not now intend to do more than substantiate our claim to priority in this subject, leaving for a future occasion a discussion of the new formula for aconitine, which Herrn Freund and Beck propose.

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* The substance of a communication to the Chemical Society of Berlin, February 25, 1894.

## THE NEW SWISS PHARMACOPŒIA.

BY C. JEHL.*

In 1865 the Swiss Society of Pharmacists published for the first time a "Pharmacopea Helvetica" in the Latin language. This work, a second edition of which was published in 1872, and a supplement to the latter in 1876, was not official, but optional, since it was not originated by the State. It is none the less true, however, that it is due to this previous work of the Swiss pharmacists that the third edition, just published, is official and obligatory for the whole Confederation, except the canton of Glarus, which has profited by the occasion to affirm its retrograde ideas and render itself immortally ridiculous. In 1889, the Federal Council appointed a commission of pharmacists, medical men, veterinarians, and chemists, to elaborate a Swiss official pharmacopœia. This commission ended its labours in April, 1893, and decided to publish the work in the three languages used in Switzerland, instead of in Latin as formerly. There will thus be three separate editions—French, German, and Italian. To preserve the same alphabetical order in all three, the Latin denominations of the drugs, etc., have been retained, and these are followed by synonyms in the other languages.

This pharmacopœia bears an international stamp which will contribute strongly, it is to be hoped, towards the realisation of the dream of the Pharmaceutical Congress—*i.e.*, the publication of a universal pharmacopœia. Thus, from the German Pharmacopœia it borrows the methods of classing and labelling active remedies and poisons, an excellent arrangement which we have strongly appreciated in Alsace, and ought to be general. The ordinary preparations are indicated by black letters on a white ground; more active ones by red letters on a white ground; whilst poisons are shut up in a cupboard and indicated by white letters on a black ground. The same regulations apply to the cellar and store-rooms.

Distilled water alone is recognised. This is also according to the German Pharmacopœia, but here (Alsace) the rule only exists on paper; for, since the enforcement of obligatory assurance against sickness, there is frequently an indisposition to pay for distilled water, and the pump has assumed its former position. The pharmacist often finds himself in a very perplexing situation on this account; for, on the one hand, the Imperial Chancellor's office orders, by its official pharmacopœia, the employment of distilled water alone in all preparations, without exception, and, on the other hand, the local authorities intimate to him the desirability of economising in the formulæ and using distilled water only where absolutely necessary.

Substances sensitive to light are to be preserved in yellow and black glass receptacles. An excellent innovation, which the German Pharmacopœia had already borrowed from that of the United States, is the specification of the degrees of fineness of the sieves used for powders and substances reduced by cutting. This is one of the most important points in modern pharmacopœias, because it contributes, in great measure, to the uniformity of laboratory preparations. The Swiss Pharmacopœia uses seven distinct sieves, one more than the German, and has accordingly finer powders and coarser species than the latter.

The work resembles the French Codex in its wide choice of formulæ and methods of manufacture of a certain proportion of chemical products which the German Pharmacopœia is content to fix a standard of purity for. Such conciseness in the latter necessitates the publication of extensive commentaries to compensate for official brevity. A preparation for which a formula might have been included is bismuth salicylate, commercial specimens of which have a very variable composition.

The distilled waters are simple in the case of plants rich in essential oil, and the others are concentrated to one-tenth with the addition of alcohol. There are five altogether, besides cherry-laurel (1 in 1000) and rose waters. Whilst the German Pharmacopœia recognises one kind of cinchona only, the Swiss recognises two—yellow (*Ledgeriana* and *Calisaya*) and red (*Succirubra*); and the French Codex three (grey, yellow, red), from numerous sources, and proving a veritable embarrassment of riches.

Where the Germans have ten plasters, the Swiss have fourteen, and the French twenty-three. A novelty, borrowed from the Americans, distinguishes the Swiss extracts, which are divided into fluid, soft, hard, and dry extracts, one part of the last being equivalent to two parts of the drug. In the sixth edition of the U.S.P. these were termed abstracts, but they have been suppressed in the seventh edition. It would be preferable to see but two kinds of extracts, fluid and dry. Pharmaceutical work would thus gain in cleanliness and accuracy.

The latter part of the book contains the following tables:—An enumeration of reagents and volumetric solutions; a table of solubilities; lists of active medicaments and poisons; maximum doses; a table indicating the proportion of active ingredients in the pharmaceutical preparations; a table of alcoholic strengths; one giving densities of solutions of ammonia, potash, and soda, as well as nitric, hydrochloric, and sulphuric acids; a comparison of degrees Beaumé with densities; two saturation tables for acids and bases; a reduction of specific weights according to temperatures; and a list of synonyms. There are eighteen tables in all. Finally, the index of contents is in four languages, including Latin.

The Swiss commission has produced a work worthy of modern science and representing an enormous amount of work, greatly augmented by the necessity of publication in three languages. But, by reason of this, the pharmacopœia will be consulted more than any other in the countries bordering on Switzerland, and thus probably hasten the amalgamation of the principal active preparations in the various European pharmacopœias. It is satisfactory to be able fully to congratulate the Swiss Pharmacopœia Commission, and particularly its president, Professor Schaer, director of the Pharmaceutical Institute at Strasburg.

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* From the 'Journ. der Pharm. von Elsass-Lothringen.'

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, MARCH 3, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

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## PHARMACY IN AMERICA AND IN THE UNITED KINGDOM.

SOME of the American pharmaceutical journals appear to manifest a certain feeling of uneasiness in regard to Mr. MARTIN's criticisms of American systems of education and legislation. The last number of the *Pharmaceutical Era* states that the remarks of Mr. MARTIN on American pharmacy have elicited considerable protest, as was to be expected. If that be the case, the protestants have not made their opinions public, and so far as can be gathered from comments which have appeared in print, it seems to be admitted that Mr. MARTIN's criticisms are very much in accord with the views held by eminent authorities in the United States. The article in the *Era* also states that there is a desire on the part of American pharmacists for information concerning the regulations governing the practice of the profession in Great Britain and its colonies, and it proceeds to give some account, not altogether correct, of the conditions prevailing here, for the purpose of comparison of the state of affairs on both sides of the Atlantic. Such a comparison would most probably lead to the discovery of weak points in both cases, and it might also lead to improvements in the systems adopted. In a subsequent article in the *Era* it is stated that, in the scheme of examination in various states, there has been a great lack of practical tests of candidates' proficiency in dispensing, and that a more practical test is being enforced by some boards of pharmacy in the United States. As a consequence, the leading colleges are said to be recognising the value of instruction afforded in the dispensing laboratory, and it is remarked that all colleges and boards must adopt that system in order to best fulfil their functions. In this particular it is added that England beats the United States.

## ALCHEMY *v.* CHEMISTRY.

IN the work-a-day world of modern chemistry there exists considerable danger of the devotees of the science becoming blind to its ideals, by reason of the apparently overwhelming importance of its realities—facts. Day by day the endless accumulation of facts proceeds, each one frequently suggesting the existence of other, kindred, facts, and the worker is irresistibly lured on and on, the while sinking deeper and deeper into the materialistic and utilitarian slough. The early chemists and their immediate successors, being only gradually and partially liberated from the restraints of habits acquired from the mediæval alchemists from whom they directly traced their descent, proceeding moreover deliberately and sedately in their pursuit of knowledge, were philosophers as much as scientists. They allowed the glamour and mystery surrounding their avocation to tincture their reflections and conclusions, thus relieving the tedium of what might have otherwise proved a monotonous and uneventful round. For even of successful and original experimental work there may be a surfeit; whilst the unvarying, yet necessary, performance of ordinary routine work may become extremely distasteful, unless the field of activity be otherwise fairly diversified.

These remarks are suggested by the perusal of a work just published by Mr. PATTISON MUIR, entitled "The Alchemical Essence and the Chemical Element," otherwise described as "an episode in the quest of the unchanging," in which the author furnishes a brief and smoothly written exposition of the gradual transition from the romance of alchemy to the romance of chemistry; the former being described as insecurely founded, false, glaring, and hard, whilst the second, firmly based and true, constitutes part of the romance of nature itself. Alchemy is defined as "a manufacturer of blinkers," distorting the vision and preventing close contact with external realities. Chemistry, on the other hand, is described as forcing men into close contact with some aspects of these realities, and helping in the task of removing "everything that prevents the full vision of nature." The argument of the author is supported by numerous quotations from HOMER, PLINY, PARACELSUS, EUGENIUS PHILALETHES, THOMAS VAUGHAN, BEN JONSON, and other writers, which are full of interest—literary, historical, philosophic, and scientific — and a perusal of the work may induce even the most case-hardened of utilitarians amongst chemists to reconsider his aversion to theories not yet fully justified by facts, and to recognise the practical value of the scientific use of the imagination. It may perhaps even convince him that time spent in attempting to realise a seemingly unattainable ideal is not necessarily wasted, but may react upon and illumine the results of his most ordinary everyday work. Such a position would not be in the least inconsistent with the truth uttered by VAUGHAN and inscribed on the title-page of the essay, that "Nature moves not by the theorie of men, but by their practice;" since, to secure the most satisfactory outcome of human labour, theory and practice must always be conjoined.

In especial relation to chemical work, the treatment of the subject will probably have the effect of showing that the needed variety can be found in the chemist's own proper sphere. Written in the hope that some who exercise their "wit and reason" in examining the problems of life may assist in the solution of Nature's other problems, that face students "who follow the quest of the unchanging," a very useful purpose would be served by the book were modern chemists induced by its aid to pause in their race for facts, and more generally to assimilate their procedure to that of FARADAY, LAVOISIER, MENDELÉEFF, and kindred workers, speculating on first principles, no less than recording final results.

### COMPLIMENT TO MR. KINNINMONT.

AT the annual supper of the Glasgow and West of Scotland Pharmaceutical Association last week, the opportunity was taken to make a semi-official presentation of an illuminated address to Mr. KINNINMONT on the occasion of his retirement from the Scottish Board of Examiners, expressing the esteem and regard entertained for him by the chemists of the district, and their high appreciation of the services he has rendered to the craft. In order to celebrate the occurrence of the jubilee of Mr. KINNINMONT'S connection with pharmacy, a subscription testimonial has been proposed by a committee formed for that purpose, and the sum of one hundred pounds has been contributed by his friends. This, at Mr. KINNINMONT'S desire, will be devoted to the purpose of offering a prize to be awarded to the member of the Association who shall take the first place in a competitive examination in Glasgow, after having first passed the Minor examination. We are sure that chemists in other parts of the kingdom who are cognisant of the long services of Mr. KINNINMONT as a member of the Board of Examiners, and of the zealous interest he has taken in all matters connected with the advancement of pharmacy, will concur with their brethren in the Glasgow district in thinking that the compliment paid to him has been well earned.

### INTERNATIONAL MEDICAL CONGRESS.

WE have been favoured with an official statement of the arrangements made in connection with the eleventh International Medical Congress, to be held at Rome, from March 29 to April 5 next. There will be a section on Experimental Pharmacology and Therapeutics, and amongst the numerous contributions to this section already announced are papers dealing with the action, etc., of *Grindelia robusta*, *Aristolochia Clematitis*, *Celastrus edulis*, *Hydrastis Canadensis*, *Carlina acaulis*, chloralose, parachloralose, cytisine, tropacocaine, pelletierine, and β-naphtol, in addition to other remedial agents. English will be one of the official languages of the Congress; and full information may be obtained by addressing the Secretary-General, XI International Medical Congress, Rome.

### UNWARRANTED CENSURE ON CHEMISTS.

IN the report, published in the Chester papers, of a recent inquest at Newtown on a case of suicide by carbolic acid, the city coroner, Mr. BRASSEY, is represented as stating that "carbolic acid was a poison which could be bought at any chemist's without being entered in a book—more blame to the chemists." But as Mr. W. F. J. SHEPHEARD, the Society's local secretary at Chester, points out, in a letter to the *Cheshire Observer*, the bulk of the carbolic acid sold for disinfecting purposes is vended by unregistered persons who have no knowledge of its dangerous properties or antidotes, and sell it in the same way as the most innocent articles of domestic consumption. Registered chemists and druggists only sell this and other unscheduled poisons with proper precautions, and voluntarily treat such dangerous compounds as though the recommendations of the Pharmaceutical Society to have them properly scheduled were rendered effective. The Society is in no degree to blame in this matter, and chemists ought not to be censured for the actions of those who carry on a business for which they are not qualified.

### EVENING MEETING IN LONDON.

AT the next evening meeting in London of the Pharmaceutical Society, on Wednesday, March 14, a lecture will be delivered by Professor DUNSTAN, F.R.S., entitled "The Nature of Aconitine." It is proposed to show certain specimens with the aid of the lantern, and Professor DUNSTAN will also perform some experiments with aconitine, on the occasion.

### LIVERPOOL CHEMISTS' ASSOCIATION.

THE annual dinner in connection with this Association will be held at the Adelphi Hotel, Liverpool, on Wednesday next, March 7, at 7.15 p.m. The LORD MAYOR of Liverpool has signified his intention of being present on the occasion, and tickets may be obtained of the Honorary Secretary, Mr. ANTHONY S. BUCK, 179, Bedford Street, Liverpool.

### SCIENCE PROGRESS.

UNDER the above title a monthly review of current scientific investigation is announced to make its first appearance this week. It will be conducted by Mr. H. C. BURDETT, and edited by Mr. J. B. FARMER, with the co-operation of Professors ARMSTRONG, SHERRINGTON, JUDD, WELDON, HOWES, and MARSHALL WARD, acting as an editorial committee. The paper will be published by "The Scientific Press, Limited," 428, Strand, W.C.

### THE METRIC SYSTEM.

IT is stated that the U.S. Bureau of Weights and Measures has decided to use the metre and kilogramme as fundamental standards, and, from April 5 next, to consider the yard and pound as derivatives from the metrical standards.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

WE are asked to announce that the sixteenth annual dinner in connection with this Association will be held at the Cannon Street Hotel, on Thursday next, March 8, at 8 p m., when the chair will be taken by Mr. T. H. W. IDRIS, J.P.

# Proceedings of Societies in London.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, February 22, the President, Mr. E. F. Harrison, in the chair, the following paper was read:—

### POISONOUS AND INFECTED FOODS.

BY A. P. LUFF, M.D., B.SC., M.R.C.P.

It occasionally happens that under certain and various conditions different articles of diet become possessed of poisonous properties. This may happen quite apart from the criminal or accidental introduction of poison, which subject will not enter into my paper to-night. Articles of food may become more or less poisonous from the following causes:—

1. The poisonous results may be due to food conveying a true infection, or to poisons developed in and from the food by bacterial agencies.

2. The poisonous results may be due to toxic metallic salts.

3. The poisonous results may be due to the presence in the food of the germs or spores of certain specific diseases.

4. The food may be infected with certain parasites or their ova, which parasites or ova are capable of undergoing development in man.

I propose now to discuss this classified list of causes *seriatim*.

### (1) THE POISONOUS RESULTS MAY BE DUE TO FOOD CONVEYING TRUE INFECTION, OR TO POISONS DEVELOPED IN AND FROM THE FOOD BY BACTERIAL AGENCIES.

1. *Meat.*—Meat poisoning has resulted from consumption of the following kinds of meat, viz., pork, ham, sausages, tongues, beef, brawn, veal-pie, pork-pie, beef-pie, and chicken broth. The symptoms produced by the consumption of poisonous meat are those of gastro-intestinal disturbance, which is more or less severe, and is accompanied by disturbance of the nervous system. The first symptoms of illness as a rule occur rather suddenly, at a varying period after consumption of the poisonous food. The symptoms generally are nausea, vomiting, pain in the abdomen, and diarrhœa, the latter being generally of an offensive character. The nervous symptoms as a rule are faintness, muscular weakness, prostration, and occasionally rigours. Usually these symptoms are followed by fever, headache, and thirst. Occasionally the nervous symptoms are more pronounced, and may produce drowsiness and even insensibility. This condition must be regarded as not simply the result of the irritant effects of the poisonous food on the stomach and intestines, but also as being due to a general disease, resembling in many of its effects a specific fever. This latter point has been insisted on by Sir George Buchanan, who says:—"That the phenomena which were spoken of as food poisoning are claiming on ever growing evidence to be regarded as true infective diseases, as much so as was scarlet fever or tuberculosis; that they have not been admitted into this rank arises, first, from the circumstance that some of them have seemed to be wanting in the incubation period; and, secondly, because they are rarely recognised as being transmissible from person to person." An epidemic occurred in Middlesboro' in the early part of 1888, and resulted in 490 deaths in a population of 98,000. It was an epidemic of pleuro-pneumonia due, at all events in part, to the consumption of American bacon, prepared by soaking in water, and then only slightly drying, salted pork imported from America. In this bacon there was found a bacillus which was capable of producing a specific general fever, the special characteristic of which was pleuro-pneumonia.

If an analysis of the cases of food poisoning occurring, from the various kinds of meat that I have mentioned be made, the following deductions may be drawn:—

(*a*) In food which has become poisonous by keeping, one or both of these two conditions obtain, viz., a living microscopic organism and an organic chemical poison, which may be a ptomaine, albumose, or toxin.

(*b*) The substance which is the immediate cause of the production of the morbid phenomena or symptoms is the chemical poison which, probably, is produced by the action of the micro-organism on the albuminous constituents of the food. In the majority of cases the presence of oxygen appears to be necessary for the development of poisonous ptomaines, and, therefore, finely divided meat is more liable to become toxic, on account of the large surface which is thus brought in contact with the oxygen of the air. In certain of the German sausages, liver and blood enter into their composition, and these ingredients appear to be especially prone to develop poisonous bases.

(*c*) Provided the conditions are favourable to the growth and activity of the micro-organism contained in the article of food, it may produce its own peculiar chemical poison from the material affording it nourishment, either outside the body of man or within it.

(*d*) Both the specific micro-organism in an infected food, and the poison resulting from the fermentative and putrefactive changes induced by it may be fleeting as regards their existence, since the micro-organism may be killed by its own products, or the chemical poison, from its unstable nature, may undergo decomposition; so that an infected food may be poisonous at one time and may fail to be so at a later period.

(*e*) In many of the cases of food poisoning that have occurred, an incubation period has been noticed; although, in some cases, it is practically wanting. When an incubation period occurs, in all probability that period is being employed by the micro-organism growing and cultivating itself within the human body, and producing during this period its poisonous chemical substance, to which the symptoms arising at the end of the incubation period are no doubt due. When symptoms are produced by poisonous food without an incubation period (that is, in from one half to a few hours after taking the food), these symptoms are probably due to the action of an organic chemical poison, previously manufactured in the food. This is what one would naturally infer, since a micro-organism, as in the other specific infections, would require time to grow, and to develop its chemical poison; whereas an article of food containing an already developed chemical poison would naturally operate more speedily, and the rapidity of the action of the poison would depend upon the amount of it taken, its poisonous nature, and on the idiosyncrasy of the individual taking the poisonous food.

(*f*) That the symptoms induced by poisonous food are not always due to chemical poisons previously produced in the article consumed, but that they are due to a true infection is shown by the fact that extremely virulent micro-organisms have been found in articles of food and in the viscera of persons dying from the consumption of such articles. As was shown in the Portsmouth pie-poisoning case, some of these bacilli may not be pathogenic, or disease producing, on inoculation, though when taken by the mouth they may produce a chemical poison which, absorbed from the alimentary canal, is capable of producing illness, and even death. The not uncommon practice of eating high game is one which is liable to be attended with danger, since the highness of the game is dependent upon putrefactive changes that have occurred in it. The cooking of the game possibly destroys the bacilli of putrefaction in the food, but does not necessarily destroy the chemical products of the putrefaction. Hence, after consumption of such game, which, to my mind, is a disgusting practice, a certain amount of headache, nausea, and lassitude, and frequently slight diarrhœa, are not uncommon symptoms the next day.

As to the nature of the chemical poisons produced in articles of food by bacterial agencies, the following three classes are known to us:—

A. The ptomaines or animal alkaloids resulting from putrefactive or fermentative changes.

B. The albumoses or poisonous proteids, which are also produced by bacterial agencies, and probably occupy an intermediate position between albumins or proteids and ptomaines.

C. Toxins, or poisons possessing an uncertain composition, which are also probably produced by bacterial agency.

2. *Fish.*—Cases of poisoning by fish, and especially by certain kinds of shell fish, are not uncommon. Mussels, crabs, lobsters, oysters, salmon, and sardines may produce symptoms of poisoning. The ordinary symptoms are those of irritation of the stomach and intestines, with vomiting and diarrhœa, more or less nervous disturbance, and not uncommonly a rash resembling nettle rash. Fatal effects may result owing to fish becoming toxic from the development of a chemical poison by bacterial agency, and in some instances the bacilli or germs appear to grow practically without an air supply, as most probably occurred in connection with the fatal case of poisoning with tinned salmon that was investigated by me in 1891, and the fatal case of poisoning with tinned sardines that was investigated by Dr. Stevenson in 1892. In both of these cases the fish, to appearance, smell, and taste seemed to be perfectly sound, and was consumed without suspicion. Most probably in these cases the contents of the tin were not completely sterilised, and so, after sealing, the micro-organisms continued to grow and produce a chemical poison, without a supply of air.

Many cases of poisoning from eating mussels have occurred. Formerly, it was believed that mussels owed their poisonous properties to the presence in them of copper derived from ships' bottoms; but the researches of Brieger have shown that the poisonous effects are due to a ptomaine named mytilotoxin, a poison which is produced within the mussels by bacterial agency, the bacteria generally gaining access to the fish from sewage contamination of the water in which they are living. It has been found that mussels gathered in harbours, or on shores polluted by sewage, are not unfrequently poisonous, and contain the ptomaine, mytilotoxin; whereas, if some of these mussels are taken to the open sea and laid down there for a few months, they lose their poisonous properties and cease to contain the ptomaine, mytilotoxin. If the mussels inhabit stagnant water, or water containing decomposing organic matter, they may also develop their peculiar poison. Oysters also, if grown in water to which sewage gains access, may develop poisonous properties.

3. *Milk.*—Milk may produce symptoms of poisoning or of disease in several ways. It may become acid from lactic acid fermentation, and in this condition is extremely liable to produce flatulence, sickness, and diarrhœa in children. Milk may also develop a poisonous substance, named tyrotoxicon, which was first discovered by Vaughan in poisonous cheese. In addition, milk may contain the germs of several of the specific fevers, which subject will be discussed presently.

4. *Cheese.*—Under certain conditions cheese may become poisonous, due to the production, as the result of a peculiar fermentation, of a toxin discovered by Vaughan, and named tyrotoxicon. Tyrotoxicon was at first considered to be a ptomaine, but its chemical composition is that of diazo-benzene-butyrate. This substance is an extremely powerful poison, producing nausea, vomiting, diarrhœa, and extreme prostration. Usually the symptoms pass off after a few hours, but death may occur from collapse. Milk and cream, as well as cheese, may contain tyrotoxicon. Cheese containing this poison need not be either in appearance or taste different from that of sound cheese.

5. *Vegetables.*—Vegetables may also develop poisons as the result of putrefactive changes, although this accident is not so likely to occur as is the case with the different kinds of meat and fish.

### (2) THE POISONOUS RESULTS MAY BE DUE TO THE PRESENCE OF TOXIC METALLIC SALTS.

Tinned provisions, but especially tinned fruits containing malic acid in the juice, may produce poisonous symptoms from impregnation with soluble tin salts. These are probably produced by the malic acid, present in the juice, exerting a galvanic action upon the solder of the tin, and so carrying some of the tin into solution as malate of tin. Tinned cherries, apples, pineapples, and tomatoes are the most liable of the tinned provisions to contain tin, the acid juice acting upon the solder of the tin as just described, or possibly on the tin surface, owing to the interior being coated with impure tin. In 1890, I investigated four cases of tin-poisoning caused by the consumption of tinned cherries, and owing to the tin from which the patients had eaten being left half full, I was enabled to determine the amount of tin present, and therefore the amount that had been taken in each case. The juice contained in solution malate of tin, equivalent to nearly two grains of the higher oxide of tin in each fluid ounce. It was estimated that the symptoms (in each case occurring in robust men) were produced by doses of malate of tin, varying from four to ten grains. Two of the patients nearly died from the severity of the diarrhœa and collapse, but finally, under careful treatment, they all recovered.

Copper sulphate is occasionally used to give a rich green colour to preserved peas and other vegetables, to olives and green pickles; copper may also gain access to articles of food which have been kept in the cold in copper vessels exposed to the air. The colouring of vegetables by the use of a copper salt is due to the formation of a copper compound with phyllocyanic acid derived from the chlorophyll. This copper salt being an insoluble one, is not as a rule found in the liquid surrounding the peas, etc., but all the same when such peas, etc., are consumed, the copper compound can exercise a detrimental effect.

Lastly, water may become contaminated with metallic impurities, such as lead, copper, and zinc; the lead is generally derived from leaden pipes, or from lead-lined storage cisterns.

### (3) THE POISONOUS RESULTS MAY BE DUE TO THE PRESENCE IN THE FOOD OF THE GERMS OR SPORES OF CERTAIN SPECIFIC DISEASES.

In this way such specific diseases as typhoid fever, cholera, scarlet fever, diphtheria, tuberculosis, actinomycosis, and anthrax may be conveyed to man. Water is the usual medium by which the typhoid germ is conveyed to the system of man, from the pollution of water with sewage containing typhoid stools. The dissemination of cholera is also mainly due to the contamination of water with cholera bacilli derived from cholera stools. Milk may contain the bacilli of typhoid fever, cholera, scarlet fever, and diphtheria. The typhoid germs may gain access to the milk either by polluted water being added to the milk or being used to cleanse the milk-cans, or by exposure of the milk to sewer air. The germs of scarlet fever may be conveyed into the milk either from the hands of a milker suffering from scarlet fever in the peeling stage, or from cows suffering from a disease which is either identical with or closely resembles human scarlet fever. Diphtheria is possibly conveyed from the cows themselves.

Tubercular disease of the intestines, which is so common among young children, is probably due to the milk containing tubercle bacilli derived from tubercular udders of cows. If such milk is given unboiled to children these tubercle bacilli are capable of setting up tubercular ulceration of the intestines. Milk may also be contaminated from the animal suffering from foot and mouth disease; if vesicles are present on the teats of cows suffering from this disease, the virus may gain access to the milk, and then is capable of producing a somewhat similar disease in the person consuming such milk. The rare disease known as actinomycosis is probably due to eating raw barley or other cereals upon which the actinomyces fungus has grown.

### (4) The Food may be Infected with Certain Parasites or their Ova, which Parasites or Ova are capable of undergoing Development in Man.

Pork may contain the small trichina spiralis worm, and so may produce in man the disease called trichinosis. Pork may also contain the cystic stage of a tape worm, and so give rise to the tape worm, tænia solium, in man; such pork is commonly known as "measly" pork. Beef may contain the cystic stage of the tape worm, tænia mediocanellata, and so give rise to that tape worm in man. Vegetables which are eaten uncooked by man, such as lettuces, watercress, etc., may contain on the surface the ova of a small tape worm named tænia echinococcus, which inhabits the intestines of dogs; the presence of the ova on the vegetables is due to dogs defecating thereon. Such ova introduced into the stomach of man are the cause of hydatid disease. Water may also contain these ova from contamination with dogs' fœces, and so may give rise to hydatid disease in man.

I have now briefly described to you the principal effects produced, and the diseases that may be conveyed to man, by the ingestion of poisonous or infected food. A word or two in conclusion, as to the preventive measures that may be employed to avert the disasters attendant upon the consumption of such food. The best preventive measure, undoubtedly, is good cooking; that is, sufficiently long exposure of the article of food to a sufficiently high temperature. The smoking of meat is not so effective as cooking. The salting of meat, generally speaking, is more effective than smoking. The importance of boiling, previous to their consumption, water and milk liable to be contaminated with the germs of specific diseases is a matter of common knowledge.

After the reading of the paper, the President remarked upon the great interest of the subject dealt with by Dr. Luff, and said although the paper had been of great general interest, yet much was especially so to pharmacists. One point that came within their scope of observation at times was mussel poisoning. It was the first time he had heard the cause of it explained and attributed to the growth of the mussels in sewage contaminated water. The infection of tinned foods by bacteria was a most important subject on account of the large demand there was for tinned goods nowadays, and too great care could not be used to perfectly sterilise them before sealing them down. Speaking of the galvanic action set up in the tin by means of the malic acid, he asked Dr. Luff if all risk of poisoning was obviated if the fruits were turned out as soon as the tin was opened. Chemistry had played a very important part in adding to our knowledge the chemical composition of the poison tyrotoxicon.

Mr. Robins asked whether the excess of malic acid in the fruit would be sufficient to generate enough hydrogen to "blow" the tin.

Mr. Millard said he would be glad if Dr. Luff could tell him whether he had been able to isolate sufficient of any of the ptomaines to examine them chemically, and whether, in the poisoned fruits mentioned, there was any definite quantity present, and, if so, what amount would be likely to prove a poisonous dose.

Mr. Lloyd Williams asked if Dr. Luff had any information as to how the bacon had been cooked in the case he had mentioned, for a temperature of 150° C. applied two or three times was sufficient to destroy most germs, and a temperature of 212° was so easily reached. Malic and most of the vegetable acids in fruits were solvents of lead, and when fruit was cooked in enamelled pans it took up a considerable quantity.

Dr. Luff, in reply to the questions raised, said that in the case he had cited, in which tinned cherries had been found to possess such poisonous properties, there was no question that the tin salt had been formed previous to opening, for the tin was opened and the cherries partaken of immediately. The tin and the fruit looked perfectly good, and the tin was not "blown" in any way. The "blowing" of tins was caused by gases which were liberated during putrefactive changes which took place, and any hydrogen which might be formed by the action of the malic acid on the tin would not escape as such, but be used up in the putrefactive decomposition which was taking place. Speaking of the ptomaines found in these poisoning cases, Dr. Luff said that the cases were so few and far between, and the quantity of material was so small, that it was impossible to determine their composition. Mr. Millard had mentioned the ptomaine which he (Dr. Luff) had isolated in the urine of scarlet fever patients; he had also isolated one from typhoid fever patients; but although he had operated upon gallons of the urine, and had used gallons of ether to extract with, yet he had never been able to isolate a sufficient quantity to determine the chemical composition of them; it was reported that they had been isolated in Germany, and their constitution studied; but he was very sceptical of the results. He had no very definite information as to how the bacon was cooked at Middlesboro', but it was known that in several cases it had been cooked in thick slices, and in this manner it was very possible that the interior was insufficiently cooked. There was no doubt that lead was taken up from the enamel of saucepans, and the fact that many deaths had occurred lately amongst the girls who worked in the enamel works had brought the subject to some prominence.

The President then proposed, and Mr. Garnett seconded, that a very hearty vote of thanks be tendered to Dr. Luff for his kindness in coming amongst them, and for his valuable paper. This was carried with acclamation, and Dr. Luff, in thanking the members, said that he always felt that he was coming amongst old friends when he came to the Association. He thought that perhaps he ought to have postponed his paper until after the annual dinner, but at that event he hoped to see a large number employing the various chemical processes necessary to digest and assimilate what was set before them, and hoped that his remarks during the evening would not be applicable to anything there.

## THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

At a meeting held on February 21, Mr. Andrews, President, in the chair, the adjourned discussion on the subject of "The Federation of Local Pharmaceutical Associations" took place.

The Honorary Secretary, Mr. Cracknell, read the original resolution, which was proposed by the Vice-President, Mr. Parker, and seconded by Mr. Burden, and was as follows:—

"That this meeting, having considered the subject of the proposed Federation of Local Pharmaceutical Associations, approves the scheme, and authorises the committee to appoint delegates."

Mr. R. A. Robinson, in moving an amendment to the resolution, said that he considered such an association was not necessary, inasmuch as the Pharmaceutical Society was a legally appointed body to look after the interests of chemists and druggists. He suggested that one of the objects of the proposed federation would be to introduce a territorial representation on the Council of the Society, and also thought that after a time the federation could not help interfering with the working of the Council, and thus cause the trade to be still more disunited. He also pointed out that the number of local associations interesting themselves in pharmacy did not amount to more than fifty (if so many) throughout the country, and thought it would be of little use to form a federated body from such a small number. He wished it to be understood that he was not opposed to the formation of local associations, but on the contrary, advocated their formation wherever possible, and urged that their federation should be with the Pharmaceutical Society. He would therefore propose the following amendment:—

"That this meeting is of opinion that the first step towards, and the best way to promote, union among those of our calling is to increase the number of members of the Pharmaceutical Society, so as to include the bulk of registered chemists—thus creating a strong and united body, having full power under existing laws to elect representatives to the Council, which will reflect and carry out the wishes of the electors, and, by united action, might exert a powerful influence upon pharmaceutical legislation in Parliament—and therefore strongly urges upon all who have not yet joined the Society to do so forthwith. Furthermore, this meeting does not see the necessity for creating another organisation as a federation of chemists' associations, which it is certain could not have the same status, cohesion, and capacity for usefulness as the incorporated Society."

Mr. Hyne seconded the amendment.

Mr. Hyslop spoke strongly in favour of supporting the Pharmaceutical Society only. He pointed out that rather more than fifty years ago, the founders of the Society met together, and in a friendly and hearty manner invited the members of the trade to come in and join them. He said that the Society then formed a cordon round some of the pharmacists of that time, and had continued to extend that cordon, gradually gaining strength, and as they were now doing good work, he could not see that any benefit would arise from the formation of another association as suggested, and earnestly asked all members of the trade to come in and join the Pharmaceutical Society, thus making a united body, possessing greater strength and power. He must therefore support the amendment.

Mr. Spink also supported the amendment, and urged the necessity of upholding the power and increasing the number of members of the Pharmaceutical Society. He considered the formation of a federated association, especially at the present time, would be detrimental to the interests of the trade, inasmuch as it would tend to weaken the efforts of the Pharmaceutical Society in the event of their applying to Parliament for fresh powers or protection, as when it became known there was a second association, the parliamentary committee, in considering any bill that might come before them, would conclude that the trade itself was not united on the subject.

Mr. Parker, the Vice-President, spoke in favour of the resolution, saying that he did not think any harm could result from a delegate being sent to the meeting at Oxford, as the Association was still not fully informed as to what the federated association intended doing, and he thought some advantage might ensue by the delegate reporting what had taken place, and then, if necessary, another discussion could be held on the subject.

The amendment was then put to the meeting and carried by a majority of ten—eighteen against eight. It then became a substantive motion, and

Mr. Knight proposed as an amendment—

"That this meeting, strongly approving of everything likely to promote unity of feeling amongst those following the occupation of pharmacy, requests those of the officers of this Association who may be in Oxford during the meeting of the proposed 'Federation of Local Pharmaceutical Associations,' to attend thereat and report to the next Annual General Meeting." He said he thought the resolution rather premature, as at present it was not fully understood what the federated association intended doing, and it appeared to him that by putting a direct veto on the proposed federation it was giving unnecessary discouragement to those who had promoted it.

Mr. Holding seconded, and said that he attended the meeting at Nottingham, and was able to state that the promoters of federation had not the least intention of doing anything antagonistic to the Pharmaceutical Society; in fact, it would help the Society, as one of their objects was to induce men to join it.

Mr. Parker said that on the grounds mentioned by the last speaker he would support Mr. Knight's amendment.

Mr. C. A. Tiley would do the same, thinking that the formation of such an association would do much good, especially in the country.

Mr. Spink, Mr. Hyslop, and Mr. Robinson again spoke, still urging the support of the Pharmaceutical Society only.

The amendment was put to the meeting and lost, and Mr. Robinson's motion carried.

Mr. Spink then proposed the following resolution:— "That this meeting conveys through its President to the Council of the Pharmaceutical Society the desirability of increasing the number of members of the Pharmaceutical Society."

Mr. Hyne seconded the resolution, which was put to the meeting and carried.

# Provincial Transactions.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

A meeting of this Society was held on Thursday the 22nd ult., Mr. T. H. Wardleworth, Vice-President, in the chair.

Mr. R. C. Cowley drew attention to the formula for "Mist. Ol. Ricini, B.P.," which is generally regarded as being unsatisfactory. The preparation can be easily made in from three to five minutes by mixing the oils, potash and syrup thoroughly in a mortar, and adding the water gradually at the end.

Mr. R. H. Mitchell contributed the following dispensing notes:—

℞ Aristol........................gr. x.
Ol. Theobrom. q. s. fit buginar.

These can be made with ol. theobrom. gr. xii., but a sticky and tough mass is formed, which is not very soluble. A better preparation is obtained by using ol. theobrom. gr. x and ung. cetacei gr. iii. They are also more easily prepared if moulded in tinfoil.

℞ Ferri Alumin... ...........gr. iii.
Ol. Theobrom. q. s. ft. suppos.

This is an unusual medicament in a suppository. They require great care in manipulation, as over-heating causes the salt to aggregate at the point of the suppository.

℞ Cocaine .........................5 p.c.
in Parolein .................. ℥i.

The cocaine dissolves with heat, but is mostly thrown out on cooling. The prescriber sanctioned the substitution of almond oil.

These items having been discussed, Mr. F. C. Larkin, F.R.C.S., delivered an interesting lecture on—

### Animal Extracts as Therapeutic Agents.

The lecturer began by describing the animal therapeutics of the ancients, and showed that the new idea of fighting disease with animal extracts was perhaps after all an elaboration of the therapeutics of our ancestors. In the 17th century animal substances were largely used in medicine, some of them not altogether without a show of reason; for instance, foxes' lungs for asthma, essence of serpents for bites, decoction of earthworms for worms, &c. In the B.P. of 1864 the only true internal remedies of an animal nature were cantharides, musk, cod liver oil, and ox-gall. But though obliterated from the books they still remained floating about in the mind of man, and about thirty years ago began to rise to the surface of the great ocean of ideas, and have since then been creeping into our journals and pharmacopœias. Modern chemistry has modified greatly our ideas of organic matter. It has introduced many refinements into medicine, and taught us how best to administer our remedies. We must remember in these days of chemistry there is no such thing as abstract virtue and principle; it is chemical compound and nothing else. The empiricism of to-day is practical, the old empiricism was theoretical. For instance, ague was treated by extract of swallows on the assumption that because swallows fly away quickly, an extract of swallows would cause the ague to fly away; while modern empiricism gives quinine, because it has shown that ague is a parasitic animal micro-organism, to which quinine is fatal. The modern administration of animal extracts is of two kinds—(1) the giving the product of a healthy part to cure a similar unhealthy part in man. Its great apostle is Brown-Sequard. (2) The giving the product of a diseased animal to cure or prevent the same disease in man ("the hair of the dog that bit him"). Its great apostles are Pasteur and Koch. The lecturer then entered into the details of Brown-Sequard's reasoning and experiments with the generative organs, and mentioned that most English observers had not experienced the same success with the testicular juice. Having described Brown-Sequard's experiments with the pancreatic juice, Dr. Larkin gave a lengthy description of the thyroid gland and its uses, and mentioned that until lately its functions were unknown, and it was looked upon as a godsend to the surgeon. The fatal effect of the removal of the thyroid in goitre as studied by Kocher, and the discovery of myxœdema by Dr. Ord were then described. Children who from birth show the characters of myxœdema are known as cretins. They are idiots and dwarfs, with thick lips and coarse skin, and though they may live thirty years, always remain such. In old Egypt these cretins were venerated as superior beings. Dr. Larkin then described the experiments by Kocher and others which led up to the injection of the thyroid juice as suggested by Brown-Sequard. Dr. Murray, Newcastle-on-Tyne, was the first to carry this out in October, 1891, using the sheep's thyroid with marked success. The administration, however, must be continued, as relapse occurs if it is stopped. The lecturer concluded by describing the various forms of administration, and said that he had really only touched on one phase of his subject. The lecture was illustrated by lantern slides; also by samples of thyroidin powder, extract, and tablets. A vote of thanks, proposed by Mr. R. C. Cowley, and seconded by Mr. J. G. Jackson, was accorded to the lecturer.

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### CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

A highly successful smoking concert was given by members and friends on Thursday, the 22nd ult., at the Bijou Theatre, Cambridge, Mr. Alderman Deck in the chair. A programme, excellently arranged by Mr. E. H. Church, was heartily appreciated by an audience of between fifty and sixty.

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### THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

A meeting of the junior section of this Association was held at the Foresters' Hall, Octagon, Plymouth, on Thursday, February 22, at 8.30 p.m. Mr. E. Green was elected Chairman for the ensuing twelve months. A proposal asking the general committee to allow the apprentices to elect a representative was deferred until the next meeting. It was then announced that arrangements were being made by the Committee of an important educational character. A proposal was carried that the next meeting (March 15) should be partly educational and social. It was afterwards resolved that special efforts should be made to bring in the few outside assistants and apprentices as members, and a vote of thanks to the Chairman concluded the meeting.

## Scottish Transactions.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The annual supper of this Association took place on Thursday, February 22, at the Bath Hotel, Bath Street, when over 100 gentlemen were present, and the chair was occupied by the President, Mr. W. L. Currie, who was supported by Professor Gairdner, M.P., President of the Royal College of Physicians; Mr. J. Laidlaw Ewing, Edinburgh, Chairman of the Executive of the North British Branch; Mr. J. Nesbit, Portobello, Chairman of the Board of Examiners for Scotland; Mr. D. Storrar, Kirkcaldy, member of Council of the Pharmaceutical Society; Dr. T. B. Henderson, Dr. Love, Dr. G. B. Todd, Dr. Mechan, Mr. R. McAdam, Mr. A. Kinninmont, Mr. J. McMillan, Mr. C. Kerr, Dundee, Vice-Chairman of the Executive of the North British Branch; Mr. Rankin, Mr. Sutherland, Dumfries; Mr. Allan, Dumfries; Mr. R. Brodie, Mr. J. Rankin, Mr. J. Rutherford Hill, Edinburgh. The croupiers were Dr. A. M. Robertson and Messrs. S. McCall Fraser and W. Greig, who were supported by Dr. Adam, Dr. Illingworth, and Messrs. Mowat, Macdonald, Law, and Edwards.

Apologies for unavoidable absence were intimated from a number of gentlemen, and the usual loyal toasts having been duly honoured,

Mr. R. McAdam, Convener of the Committee, explained the steps which had been taken in getting up the testimonial to Mr. Alexander Kinninmont. The response to the Committee's appeal had been very hearty and liberal. The sum of £100 would, by Mr Kinninmont's express desire, be put into a Kinninmont

Prize Fund, the annual proceeds to be devoted to a prize to be awarded to the member of the Glasgow and West of Scotland Association who, having just passed the Minor examination, shall take a first place in a competitive examination in Glasgow under conditions to be arranged. It had also been decided to present Mr. Kinninmont with an illuminated address, and he called upon Mr. Robert Brodie, one of Mr. Kinninmont's oldest friends, to perform this duty.

Mr. Brodie then, after referring to the fact that this year was the jubilee of Mr. Kinninmont's connection with pharmacy, and having described the prominent part he had taken for many years in pharmaceutical affairs in Glasgow, presented him with a very handsome illuminated address in the following terms:—

"Presented to Alexander Kinninmont, Esq., Ph.C., F.C.S., on the occasion of his retiring from the Scottish Board of Examiners of the Pharmaceutical Society of Great Britain, after twenty-one years' service.

"Dear Sir,

"We, Chemists in Glasgow and West of Scotland, and other friends, deem this a fitting opportunity for conveying to you an expression of our regard and esteem, and our appreciation of the able and valuable services which you have rendered to local pharmacy for the past forty years.

"The honour and distinction with which you have so long held the position of Examiner to the Pharmaceutical Society has won from all of us our warmest admiration and regard, and by your special knowledge and ability, your just, yet kind and considerate nature, you proved a worthy and model Examiner.

"As a pharmacist, you have long held a leading and honoured position in our midst, ever seeking to promote the advancement of pharmaceutical knowledge and education, and ever ready to accord the utmost courtesy and kindness to all seeking information or advice.

"That you have well earned the comparative rest you now seek, is a conviction which we all share, and we unite in heartiest and best wishes for your future health and happiness.

"Along with this address is presented the sum of £100, which you generously desire should be devoted to the purpose of establishing a Prize in connection with pharmacy in Glasgow and the West of Scotland, to be called the 'Kinninmont Prize.'

"Signed in name of the subscribers—
"Robert McAdam, Chairman.
"William L. Currie, Secretary.
"Walter Paris, Treasurer.

"R. Brodie, A. M. Robertson, James Dickie, John Foster, Wm. T. Law, John McMillan, David Lees, Alexander Boyd, Thomas Adam, Members of Committee."

Mr. Kinninmont said he was overwhelmed by the kindness which had prompted this presentation, and by the eulogistic terms in which Mr. Brodie had referred to him. The position of examiner had been a great pleasure to him, but it was not by any means so easy a post as many might imagine. They had constantly to bear in mind the interests of the public on the one hand and the interests of the candidate on the other, and it was not always easy to give a clear answer to the question—Is this man fit to be put upon the Register? He felt bound to say that he thought all the examiners were actuated by a desire to treat every candidate with the most perfect fairness and courtesy. They had to strive, and did strive, to be lenient without being lax. He hoped this prize scheme would be properly established, and that some permanent good would come of it.

Mr. Nesbit, Portobello, Chairman of the Scotch Board of Examiners, proposed a vote of thanks to the Testimonial Committee, coupled with the name of Mr. Boyd, who suitably replied.

Mr. D. Storrar, Kirkcaldy, member of the Pharmaceutical Council, proposed "The Medical Profession." He said there was no profession that held a higher place in public esteem than that of medicine, and there was none in which pharmacists were more deeply interested. The presence of so many medical men on this occasion was a great honour to pharmacists, and highly honourable to the medical profession. He took it as a sign of the friendliness which they so much desired to see between medicine and pharmacy. He had great pleasure in coupling with this toast the name of Professor W. T. Gairdner, the distinguished President of the Royal College of Physicians, Edinburgh, who was known and respected by all who took an interest in medical study and teaching.

Professor Gairdner, in responding, said he could not without emotion witness their manifestation of good feeling towards Mr. Kinninmont, of whom he had often heard as a skilled pharmacist, and one who maintained a high standard of professional honour. It did them all good to see such qualities thus frankly recognised. He was glad to recognise the desire for co-operation between medicine and pharmacy, and he was glad to see that medicine and pharmacy were coming more and more into touch, for they had the same object in view. Their main object was to work together for the good of humanity. They should cultivate mutual respect, and it was to the advantage of both that medicine and pharmacy should be separated into distinct departments. He was very pleased to be present to acknowledge this toast, and he trusted the Glasgow Association would flourish.

Dr. T. B. Henderson proposed "The Pharmaceutical Society of Great Britain." He said the Pharmaceutical Society had done good work as an educational and examining body. He thought it had conferred a benefit on the medical profession. At least, that was so in his case. The medical curriculum had been extended to five years, and the last year was to be devoted to special studies. He thought one or two hours a week in the establishment of a skilled pharmacist would do medical students a great deal more good than a three months' course of practical pharmacy in a school or dispensary. If they did this they would not be so ready as they were to prescribe so-and-so's pills or syrup, which medical men were to blame for ordering. He regarded the relationship between the medical man and the pharmacist as most important, for the former had to depend upon the skill and integrity of the latter and the purity of the drugs he supplied. Every pharmacist, to some extent, shares the responsibility of the medical practitioner. He thought the Pharmaceutical Society deserved every encouragement in insisting on a high educational attainment and a lofty standard of honour among its members. He had much pleasure in coupling with this toast the name of Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch.

Mr. J. Laidlaw Ewing, in responding, said this was the second time he had had the honour of responding to this toast at this large gathering. The Society had two sides, the scientific and the administrative. In the first, as a teaching and examining body, and by the institution of a research laboratory, the Society had done much to advance the status and science of pharmacy. He saw before him a copy of the Edinburgh pharmacopœia of 1841. They must ever regard that book with respect, for it was brought out under the auspices of the Royal College of Physicians, whose distinguished President he was pleased to meet at their hospitable table. The various editions of that pharmacopœia were brought out under such great men as Cullen, Gray, Christison, and Allison, but they could not but recognise an enormous advance in the imperial British Pharmacopœia, which was now taking shape. It was gratifying to observe the increasing share which pharmacists were taking in this work, and it was only by the co-operation of the scientific physician and the practical pharmacist that a thoroughly good edition of such a book could be produced. In the administrative department of the Society's work they had the new scheme of local secretaries, under which three gentlemen had been appointed assistants to Mr. Kinninmont, and he hoped for increased support to the Society as a result of their labours. He would especially commend to their notice the Benevolent Fund of the Society, which needed and well deserved all the support they could give it. With regard to the punitive powers of the Society he would say little, as some points were still *sub judice*. On the one hand Mr. Ernest Hart was urging the Government to press upon the Society the need for applying the law, while some other members of the medical profession were saying they had exceeded their powers. He could only say that the Society would seek to discharge the duties laid upon it by the Legislature without fear or favour. He would just like to say they regarded Mr. Kinninmont as an officer who had served the Society well, and he carried with him into his retirement their best wishes and highest esteem. He had to thank Dr. Henderson and that large gathering for the cordial way in which this toast had been proposed and received.

The Chairman then proposed "The Glasgow and West of Scotland Pharmaceutical Association." He said the Association was highly honoured in having such distinguished guests present, and thanked the members for re-electing him as president. The membership of the Association had increased from 126 last year to 160 at present; and the number would probably soon be greater. The meetings had been well attended, and considerable interest manifested by the members in all things pertaining to the bettering of pharmacy, but a great deal remained to be done. The Pharmaceutical Society must receive more support from the general body, and particularly by such as were not already connected with it in any way. It was a great pity that educated men should not support the Society from which they had obtained their qualification, and through which any material improvement in the position must be effected.

Other toasts were "The Strangers," by Mr. W. T. Law, acknowledged by Mr. Charles Kerr, Dundee; "The Croupiers," by Mr. W. C. De Nance, acknowledged by Dr. A. M. Robertson; and "The Chairman," by Mr. J. W. Sutherland.

The evening's proceedings were enlivened by songs, etc., by Mr. R. Brodie, Dr. Mechan, Mr. Leiper, and Mr. Law.

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## EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The sixth meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, February 14, at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, the following communications were read:—

### NOTES ON PERCOLATION.

BY PETER BOA.

The author gave a description of the process of percolation, and explained the principle of it. His remarks were illustrated by a practical demonstration of the various methods employed. He recommended a moderate degree of fineness in the powdering of the drug, and preferred to regulate the flow of the menstruum by having the delivery tube furnished with a tap or an adjustable clamp, rather than by special attention to the packing of the drug in the percolator. He preferred this method also to the long rubber tube recommended in the U.S. Pharmacopœia, on the ground that the latter required constant attention owing to the alteration of level in the menstruum.

The next communication was on

### TINCTURE OF IODINE.

BY C. F. HENRY.

Tincture of iodine has long been a subject of controversy, and after fifty years it cannot be said we have a satisfactory preparation, though various and varied have been its formulæ.

The Edinburgh Pharmacopœia tincture, which is still in considerable demand, had a strength of 1 in 16, and was made with spirit alone, by the aid of heat. The London Pharmacopœia preparation, termed tinct. iodini co., contained iodine 1 in 40, and potassium iodide 1 in 20. The 1864 Pharmacopœia ordered 1 in 40 of iodine, with 1 in 80 of potassium iodide, and this was retained in the 1867 edition. In 1870, Mr. Martindale (*Pharm. Journ.* [2], vol. xi., p. 601) pointed out that this proportion of potassium iodide was insufficient to render the tincture miscible with water, and in the 1885 edition the proportion was increased to 1 in 40, making the quantity of potassium iodide equal to the quantity of iodine.

A comparison with foreign pharmacopœias gives approximately the following results:—French Codex, 1 in 15¼; German and Russian, 1 in 13; United States, 1 in 14⅓; Austrian, 1 in 17; Dutch, 1 in 16. These are all made without potassium iodide, and are all very much stronger than the British preparation, which is 1 in 40. It is the weakness of the British tincture that has been most criticised, and it has several times been emphatically condemned.

Against the plea that the present tincture is too weak, it may be urged that it is intended for internal use, and that the liniment is meant to supply the need for an external application. Against this plea I would urge, first, that the tincture is frequently prescribed for external use, and fails in its purpose. Secondly, that the tincture of the Edinburgh Pharmacopœia is regularly prescribed by many on account of its suitability, and the existing pharmacopœia should contain a preparation which would obviate recourse to an obsolete pharmacopœia. Thirdly, that the frequency with which the liniment is diluted when prescribed shows that it is too strong in most cases. Fourthly, because there should be no difficulty in having a preparation suitable for both internal and external use, which should take the place of the present tincture and liniment. To suggest a formula for such a tincture is the object of this note. The author detailed a series of experiments which pointed to the conclusion that the following formula most suitably met all requirements:—

Take of—

| | |
|---|---|
| Iodine | 1¼ ounce. |
| Iodide of potassium | 1¼ ounce. |
| Distilled water | ½ fl. ounce. |
| Glycerin | ½ fl. ounce. |

Rectified spirit, sufficient to make 20 fluid ounces.

Add the iodine and iodide of potassium to the water, allow to stand till dissolved, then add the glycerin and sufficient rectified spirit to make twenty fluid ounces. Such a tincture (1 in 16) would be suitable for both internal and external use, and is like the present tincture, miscible with water in all proportions. The dose would be 2 to 8 minims, and 24 minims to the fluid ounce would make a vapor iodi corresponding to the present official vapor iodi.

The next communication was on

### Liquefied Carbolic Acid.

BY C. F. HENRY.

The author gave the results of a number of experiments which confirmed the suggestion made by Mr. Boa in a recent paper (*Pharm. Journ.* [3], xxiv., p. 511). He found that the best results were got by using 90 fluid parts carbolic acid, 7½ fluid parts water, and 2½ fluid parts rectified spirit. In the subsequent discussion it was suggested that the stability of the liquid at low temperatures might be attained by adding 15 per cent. rather than 10 per cent. of water.

The reading of the papers was followed by discussion, taken part in by Messrs. Boa, Cowie, Dey, Duncan, Henry, Hill, and Macpherson, and on the motion of the chairman a hearty vote of thanks was awarded to the authors.

## EDINBURGH PHARMACY ATHLETIC CLUB.

The above club's second annual smoking concert came off on Wednesday, February 21, in the Café Royal Hotel. Mr. W. Richardson (Anderson and Co.) was in the chair, and there was an attendance of about 100 members and friends. A capital programme was submitted for the delectation of those present, embracing as it did songs, recitations, dances, with selections on violins, cornet, mandoline, and banjo. Two toasts were proposed during the evening—"The Edinburgh Pharmacy Athletic Club," by the chairman, reply by Mr. J. P. Gibb; and "Kindred Clubs," by Mr. W. D. Jameson, reply by Mr. W. M. Carment. The proceedings, which were of a most enjoyable nature, did not terminate till an early hour in the morning, Mr. W. B. Cowie proposing a vote of thanks to the chairman for presiding.

# Parliamentary and Law Proceedings.

### The Sale of Carbolic Acid.

In the House of Commons, on Monday, Mr. Picton asked the Parliamentary Secretary to the Local Government Board whether the *British Medical Journal* of December 30, 1893, was correct in stating that he had written to Mr. Ernest Hart, Chairman of the Parliamentary Bills Committee of the British Medical Association, in reply to a communication urging protective restrictions on the sale of carbolic acid, and in that reply had promised the serious consideration of the Board; whether he can now state the result of that consideration; and whether he is aware that between the date of his reply to Mr. Hart and the 10th of February twenty-seven deaths from carbolic acid, either by suicide or misadventure, have been reported by the press.

Sir W. Foster stated, in reply, that the imposition of restrictions on the sale of carbolic acid was a matter for the Privy Council and the Local Government Board. He was in communication with that Department, which, he believed, had the matter still under consideration.

### Habitual use of Chlorodyne.

Dr. G. Danford Thomas held an inquest on Wednesday, February 14, at the Coroner's Court, Holloway Road, touching the death of Eliza Stadmüller, aged 48, the wife of a watchmaker residing at 41, Grovedale Road, Highbury. According to the husband of the deceased, the latter first began to take chlorodyne to "soothe her" eight years ago, on the advice of a doctor. It was recommended only for temporary use; but Mrs. Stadmüller continued to take the drug habitually ever since, and the witness, when he returned home from work, often found her stupefied from its effects. She was never happy unless she had a bottle of chlorodyne handy, and the witness had tried in vain to wean her from her habit.

The coroner: Chlorodyne is, we know, a narcotic. It is composed of chloroform, opium, morphine, prussic acid, Indian hemp, treacle, and peppermint.

The husband added that the deceased obtained a two-ounce bottle of chlorodyne on Saturday. On Monday morning she fell on the landing on the first floor, and died before a doctor could arrive.

Dr. W. H. Noble, who was called in, and who had since made an autopsy, said that death was due to syncope from sudden cardiac failure. Mrs. Stadmüller had a weak, fatty heart. Though an habitual chlorodyne user, there was no trace of poison found either in the stomach or its contents. It was stated that she had no chlorodyne on the Sunday or on the Monday morning.

The coroner: Perhaps she died for the want of it—for the want of a stimulus to a weak, feeble heart.

Mr. Blackham, chemist, of Holloway Road, said the deceased usually bought two or three two-ounce bottles of chlorodyne from him in the course of a week.

The jury returned a verdict in accordance with the medical testimony.—*St. James's Gazette.*

### Death from Overdose of Chlorodyne.

An inquest was held on February 21, by Mr. Smelt, Manchester Deputy City Coroner, on the body of William Woodcock, aged 51, a watchman, who lodged at 39, William Street, Ardwick. Deceased was a watchman in the service of Mr. Stubbs, machinist, Mill Street, Ancoats, and had suffered from lung disease. To ease his pain a friend suggested to him that he should take chlorodyne and peppermint, and he followed the advice. When he went on duty on Tuesday night it was noticed that his appearance was peculiar, and being asked what the matter was said he had taken too much chlorodyne. He was taken to the Ancoats Hospital and put under treatment, but died shortly after admission. A verdict of accidental death from an overdose of chlorodyne was returned.—*Manchester Courier.*

### Death from Overdose of Sweet Nitre.

On February 19, an inquest was held at Nelson, Lancashire, touching the death of Mary Ann Hargreaves, aged 54 years, wife of Thomas Hargreaves, formerly a member of the Nelson Town Council. It was stated that the deceased had been addicted to drink of late years, and had recently taken to drinking sweet nitre. On Friday last she drank a shilling's worth of nitre. She was found unconscious in the evening, and died a few hours later. The jury returned a verdict of "Death from excessive drinking, accelerated by the drinking of sweet nitre."—*Morning Leader.*

# Obituary.

Notice has been received of the death of the following:—

On January 27, Samuel Whittle, Pharmaceutical Chemist, of Leigh, Lancs. (Aged 66 years). Mr. Whittle's connection with the Society dates from 1853.

On February 20, Thomas Griffiths, Chemist and Druggist, of Llandovery.

On February 21, Edwin Cornforth, Chemist and Druggist, of Aston. (Aged 59 years). Deceased was a member of the Society, which he joined in 1872.

## Correspondence.

*** *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only.*

### MEDICAL MEN AND PHARMACISTS.

Sir,—I read with very much regret the letter in your columns of Saturday last with the above heading. When physicians relinquish dispensing in favour of chemists, it is the duty of chemists to act honourably and cease from prescribing, except in very minor ailments, in which physicians have no wish to interfere. The chemists of Margate are called upon to defend their character. Can they do so? I am acquainted with one town where one surgeon, when he has a difficult case, prevails upon his patient to visit a West-end physician. He writes a note beforehand to the physician, desiring the prescription to be sent to him. Hence the chemist never sees the prescription. Two other medical men in the same town sell to their patients trusses, suspensory bandages, Kepler's malt extract, etc., at unusually low prices, thus robbing the chemist of his legitimate trade. In such cases where medical men dispense their own, there is nothing left in these days of severe competition but either to prescribe or starve. By virtue of their special education, it is the proper function for the doctor to prescribe and the chemist to dispense. Personally, I should hail the day if this was to be the law of the land.

VERAX.

Sir,—As the natural inference to be drawn from the letter appearing under the above heading in last week's issue is that all the chemists of Margate are guilty of violating the understanding between them and the medical men regarding counter prescribing, I desire, as far as I personally am concerned, to deny the accuracy of the charge. I do not profess to answer for the whole of the fraternity, but I feel certain that I am not alone in discouraging prescribing in every possible way.

*Margate.* D. T. EVANS.

Sir,—The cause for the letter from the Margate Medical Society, as reported in last week's issue of the *Pharmaceutical Journal*, is very regrettable, and it may be hoped the gentlemen against whom the accusation is levelled will lose no time in coming to a friendly understanding with the members of the Society in question, whose voluntary action, as stated in your article on page 691, is a rare occurrence. Many of my customers have referred to the fact of the Margate chemists enjoying the monopoly of dispensing, and I know one or two whose establishments enjoy a high reputation that makes the mouth water of one who is less highly favoured. Is it not a fact that whilst in favoured districts doctors and chemists come to an understanding on the question of dispensing and prescribing, they are socially separate and distinct callings, instead of being two branches of one calling? If the dispensing and prescribing by the specially fitted men are to become a recognised fact in all districts, the surest way for such a wished for consummation is for the chemists and doctors of each locality to form an association, the members of which agree not to infringe on the domains of the others' rights. By being frequently in contact with each other, mutual respect and watchfulness in upholding the integrity of the other branch is more likely to be permanently satisfactory. It is a notorious fact that in almost every district there are one or two chemists who cater for a "prescribing reputation" above their fellows; so much so that a man is thought little of if he cannot successfully compete against the doctor's surgery. The Apothecaries' Society would have no difficulty whatever in obtaining convictions against such glaring infringements of their rights. It is from the fact of these men being uninterruptedly allowed to usurp the doctors' sphere that others venture in the same direction in order to keep a business together, and thus prescribing by chemists becomes far too general. Even in herbalists' windows notices are conspicuously exhibited, informing the public "a lady attends to advise in female complaints." It would surely be equally as remunerative to each branch if active measures were taken to suppress this growing evil, and each be compelled to limit themselves to that calling for which they are severally trained. What is done elsewhere ought to be possible in England.

RECIPROCITY.

Sir,—I have had a long stay in one of the most prominent pharmacies in Margate, and it certainly was not the custom there to cultivate any prescribing work. No small number of the visitors, however, seemed to suppose that behind every coloured carboy a doctor may be found, and it was sometimes easier to give a remedy than to show that you were the wrong person to be applied to. I can safely assert that to refuse to prescribe and to give the address of medical men was of daily occurrence. But to some you must give a liver pill, or a saline mixture, or a cough linctus; otherwise the sufferer will go to the patent medicine emporium in the High Street and obtain there what he has last seen advertised to fit his complaint. My employer's opinion must please all doctors—that it was more profitable to him to dispense than to dabble in counter prescribing.

H. S.

### MALAYAN ARROW POISONS.

Sir,—Mr. W. T. Thiselton Dyer says (*ante*, p. 659) that he can find no reasons given by me (*Pharm. Journ.* [3], xxiii., p. 389) for the statement that the botanical sources of these poisons are unknown. Permit me, therefore, to endeavour to make the reasons clearer, if possible.

(A) With respect to the species of *Strychnos* (Aker and Lampong). (1) I stated that the specimens had neither flowers nor fruit; now it is well known to most botanists that it is impossible to accurately name species of this genus without flowers; (2) the eminent botanists alluded to by me differed in opinion concerning the specimens. One thought they probably belonged to *S. Maingayi*, Clarke, another that they were probably new species of *Strychnos*, and a third that they were nearer *S. Wallichiana* in appearance; (3) the natives who collect the roots consider the plants to be distinct.

(B) With respect to "Prual." The *Kew Bulletin*, 1891, p. 267, refers the plant received as that yielding "Prual" root to one of two genera, "possibly *Lasianthus* or *Urophyllum*," both belonging to the Rubiaceæ. But a celebrated botanist, an expert in histology, to whom I sent the "Prual" root, affirmed positively that it does not belong to the Rubiaceæ. The most easy solution of these conflicting opinions is to suppose that the herbarium specimen of "Prual" sent to Kew, as suggested by Dr. Stapf, is not the one yielding the root, for Dr. Stockman has proved that the "Prual" root out of the same parcel as that examined histologically is very poisonous, and there can therefore be little doubt that the root is right, if the plant be wrong. Now, under these circumstances, would Mr. Dyer, or any other botanist, like to affirm in print that the plants have been accurately identified, or even that the exact species yielding the poisons are known? I held it unwise to do so, and consequently said so to Dr. Stockman. As Curator of the valuable herbarium of medicinal plants belonging to this Society, it has always been my aim to be, as far as possible, personally responsible for the labels placed upon them. I, too, expend some pains in verifying them.

There is one point in Mr. Dyer's letter which I cannot pass over. He implies that I have followed an unusual course in taking the opinion of distinguished botanists who may happen to be working in the herbarium at Kew. I think that he misapprehends the circumstances. I have hitherto, when visiting this immense collection of plants, been referred by the keeper, or one of the assistants, to the officer who is best acquainted with the particular genus or species in which I am interested, or if an eminent botanist be present who has seen the plant growing, or is likely to be able to give any better information by reason of having monographed or otherwise paid special attention to the genus, I have on more than one occasion been politely introduced to him in order to obtain his opinion. The two gentlemen whose opinion I asked were already known to me, and I cannot see that the accident of their being at the time in the Kew Herbarium when I asked their opinion should prove any bar to obtaining the most accurate information possible. As one of the gentlemen happened to be the author of the species in question, it would, I think, be the opinion of most botanists, that with authentic specimens for comparison before him, no higher authority could be consulted, notwithstanding that he subsequently, with characteristic modesty, declares that his opinion is worthless.

17, *Bloomsbury Square, W.C.* E. M. HOLMES.

### ŒSYPUM *v.* LANOLIN.

Sir,—In the case Darmstädter *v.* Richardson it was contended that although œsypum had been known for centuries there was no evidence of its ever having been used medicinally. I have just come across a passage in H. Peters' "Pharmacy in Bygone Days" ('Aus Pharmaceutischer Vorzeit in Bild und Wort,' Berlin, J. Springer) which has a direct bearing on this question, and may be not without interest to some of your readers. In Germany the dispensing charges are regulated by the so-called "Arznei-Taxe," which is issued by the Government at certain intervals (now every year), and contains a detailed list of prices of all articles actually used in the compounding of medicines, whether included in the pharmacopœia or not. These official publications, according to Peters, date back as far as 1486. However, one of the most complete of these early editions was issued at Dresden, and appeared in print in 1552, a copy of which is still, if I mistake not, in the library of the Nuremberg Town Hall. It is from this Arznei-Taxe of 1552 that Peters quotes several items, among them: Œsypum at 1 "groschen" (1¼d.) for 1 "loth" (½ oz.). In conclusion, allow me to point out that the term œsypus now generally used is not correct, as Pliny calls the substance œsypum.

149, *Houndsditch, E.C.* K. HEBBELER.

### MR. CROSSE AND ACARI.

Sir,—Mr. Mumbray seems a little confused in his fifty years' reminiscence (page 705). Mr. Crosse did not reside in Yorkshire, but near Taunton, in Somerset, where I had the pleasure to spend a day with him and his extensive and unique apparatus for "aerial electricity" and other experiments. But he did not draw his "continuous mild streams of electricity" from the wires extending over his park. This would be impossible, although he drew sparks that would kill an elephant, and charged his large Leyden battery in a few seconds. For his patient and long continued experiments in crystallising minerals, in the course of which the famous *Acari* made their appearance, he used a modification of Daniel's battery. While writing, may I ask if any of your country readers ever noticed or heard of phosphorescence, like that of the glow-worm, in the common centipede. A few months since I met with a case, and I now hear from a friend who is known as an expert student and writer in natural history that he has also met with it.

*Bilbrook.* W. SIMONS.

### BENEVOLENT FUND.

Sir,—I have an idea that an amount may be raised for the Benevolent Fund by the Divisional and Local Secretaries by the following method: I shall go round and ask every chemist in my district to give me sixpence; let others do likewise.

HENRY WIGGINS,
*District Secretary for Rotherhithe.*

## Answers to Correspondents.

*Burroughs, Wellcome, and Co.*—The fruits you kindly send are the product of a species of *Raphia* (Palmaceæ). The banana, *Musa sapientum*, on the other hand, is classed in a separate order, Musaceæ.

*J. O. Goodwin.*—Refer to Abney's 'Treatise on Photography,' Hardwich's 'Manual of Photographic Chemistry,' and Vogel's 'Chemistry of Light and Photography,' all of which are in the Society's library.

## Notices of Meetings next Week.

### MONDAY, MARCH 5.

*Society of Chemical Industry*, at 8 p.m.
"The Zymean Metallurgy," by Admiral J. H. Selwyn.
"The Commercial Production of Chlorine by the Ammonia-Soda Process," by F. Bale.
"Notes on Lithographic Varnish," by F. H. Leeds.

*Royal Institution*, at 5 p.m.
General Monthly Meeting.

*Imperial Institute*, at 8 p.m.
"The Compleat Angler in the Antipodes," by W. Senior.

### TUESDAY, MARCH 6.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (eighth lecture), by Professor C. Stewart.

*Society of Arts*, at 8 p.m.
"Travels on the Zambesi," by Mons. Foa.

### WEDNESDAY, MARCH 7.

*Edinburgh Chemists', Assistants', and Apprentices' Association*, at 9.15 p.m.
Notes and Queries, conducted by Wm. Duncan.

*Liverpool Chemists' Association*, at 7.15 p.m.
Annual Dinner at the Adelphi Hotel.

*Society of Arts*, at 8 p.m.
"Refrigerating Apparatus," by Professor Carl Linde.

### THURSDAY, MARCH 8.

*Royal Institution*, at 3 p.m.
"The Vendânta Philosophy" (second lecture), by Professor Max Müller.

*Chemists' Assistants' Association*, at 8 p.m.
Annual Dinner at the Cannon Street Hotel.

*Imperial Institute*, at 8 p.m.
"Buddhism in Connection with Ceylon," by Rev. Canon R. Morris.

*Society of Arts*, at 4.30 and 8 p.m.
"The Indian Currency," by J. Barr Robertson.
"Pewter," by J. S. Gardner.

### FRIDAY, MARCH 9.

*Royal Institution*, at 9 p.m.
"The Making of a Modern Fleet," by W. H. White.

### SATURDAY, MARCH 10.

*Royal Institution*, at 3 p.m.
"Light" (fifth lecture), by Lord Rayleigh.

*Pharmaceutical Football Club* v. Charing Cross Hospital, at Shepherd's Bush, at 3 p.m.

## Books, etc., received.

A CRITICAL REVIEW OF THE SEVENTH DECENNIAL REVISION OF THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA. By GEORGE M. BERINGER, A.M., Ph.G. Reprinted from the *American Journal of Pharmacy*. Pp. 47. From the Author.

QUALITATIVE ANALYTICAL TABLES. By FREDERICK DAVIS, B.Sc. Pp. 22. 1s. London: John Gower. From the Publisher.

SHALL THE PRACTICE OF MEDICINE AND THE PRACTICE OF PHARMACY CONTINUE DISTINCT AND SEPARATE? By J. M. GOOD, Ph.G. Reprinted from the 'Journal of the American Medical Association.' Chicago, 1894. From the Author.

CONGENITAL AFFECTIONS OF THE HEART. By GEORGE CARPENTER, M.D. Lond. Pp. 103. 3s. 6d. London: John Bale and Sons. From the Publishers.

*Errata.*—In the list of subscriptions to the Benevolent Fund, published last week, Gavin, T., Manchester, should be credited with 10s. 6d., not 5s., and Powell, S. R., London, with 5s., not 10s. 6d.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Barclay, Buck, Dunlop, Liversedge, Pickering, Stephens.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, MARCH 10, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE COUNCIL MEETING.

At the meeting last Wednesday, a letter from the brother-in-law of the late Mr. R. H. Davies was read, expressing, on behalf of his sister, thanks for the resolution of condolence passed by the Council at a recent meeting.

The additions to the roll of the Society comprised four pharmaceutical chemist members, three chemist and druggist members, twenty-three associates, and twenty-eight students.

A special feature of the Finance Committee's report was the recommendation that a sum of £1000 should be placed to the credit of the Chairman of the Executive of the North British Branch, to provide for the payments necessary in connection with the new buildings at Edinburgh. Incidentally, the President mentioned that the work is proceeding satisfactorily, and that the Chairman of the Executive and his Committee are taking great care in supervising it, with the assistance of Mr. Hill. The receipts on account of the Benevolent Fund amount to about one hundred pounds, together with a donation of £9 8s. 10d. sent by Mr. Woolley as the balance from a very successful ball held under the auspices of the Manchester Pharmaceutical Association. Though it may be expected that subscriptions amounting to a much larger sum will come in during this month and next, there is great need for local secretaries to make special efforts for obtaining subscriptions and creating greater interest in the Fund. The support of the Fund, as the President put it, is a duty incumbent on all members of the trade, and it is that view of the matter which requires to be impressed upon them.

On the recommendation of the Benevolent Fund Committee two grants of fifteen pounds each and one of ten pounds were ordered to be paid. The Secretary reported the death of an annuitant. In seconding the motion for the adoption of the report, Mr. Atkins emphasised the remarks of the President as to the importance of personal application for subscriptions by local secretaries, as many persons thoroughly impressed with the good done by the Benevolent Fund nevertheless waited to be asked to subscribe. That view of the matter was supported by Mr. Grose, who thought that a little personal effort on the part of local secretaries generally would considerably increase the subscriptions. Mr. Young, on the contrary, thought that was doubtful.

The report of the School Committee contained a reference to a scheme which has been submitted by Mr. Schacht for modifying the system of awarding prizes to the students. This scheme has been considered by the Committee in conjunction with the staff of the School, and in accordance with the opinion expressed in a letter received from the Dean, the Committee has decided not to recommend the adoption of the scheme. In reference to this portion of the report, the President stated that Mr. Schacht's proposal had been framed on the lines of the system carried out at University College, Bristol, the candidates being classed and receiving a certificate accordingly, instead of the medals now awarded, which so often fall into the hands of one very successful student. Mr. Schacht said that his proposal was not merely an imitation of the system followed at University College, Bristol, but was framed in reference to the general practice at universities, and though he felt disappointed that the general feeling was opposed to its adoption at present, he was glad to find that it was not finally disposed of, but that there was some possibility of its being more favourably entertained on a future occasion.

Another subject referred to in the report of the same Committee was the desirability of formulating a code of ethics, as suggested by a resolution of the Chemists' Assistants' Association, and the Committee reported having come to the conclusion that the formation of a code of ethics is at the present time impracticable. In the discussion of this subject the President remarked that the main points of the suggestion were such as would command the sympathy of all right-minded men, and he thought it a good omen for pharmacy that there should be a strong desire among the younger members of the body to take a high view of their position.

Wednesday, May 23, was fixed as the date on which the annual meeting is to held, and the preparation of the annual report was remitted to the Library, etc., Committee.

Mr. Thomas Higham was appointed local secretary for Lewes in the place of Mr. Saxby, who has resigned the office.

In reference to an invitation to send delegates to the International Medical Congress in Rome, it was resolved that the President should appoint two members of the Society to attend the Congress. The decision as to a similar invitation from the Secretary of the International Congress of Hygiene and Demography was deferred.

Vol. LIII. (Third Series, Vol. XXIV.), No. 1237.

The report of the General Purposes Committee gave the usual statement of progress made with cases placed in the solicitor's hands. Judgment has been obtained in several instances, in others penalties and costs have been paid without trial, and some cases are awaiting decision.

The Registrar was authorised to institute proceedings in several cases of alleged infringement of the Pharmacy Act, in accordance with the recommendation of the Committee.

### DECISION UNDER THE PHARMACY ACT.

Our readers will be glad to learn that the judgment delivered in the Derby case (p. 768) by his Honour Judge Kenelm Digby completely supports the position which the Pharmaceutical Society has been constrained to take in regard to the sale of secret remedies containing poisons within the meaning of the Pharmacy Act, at the instance of the Treasury department, the medical profession, and many coroners. But the principle upon which the application of the Pharmacy Act to those articles is to be based still remains somewhat undetermined. As might be expected, the judgment in the Derby case follows the authorities in the Piper case by holding that the article to which it relates is within the purview of the Act because it was proved to contain a scheduled poison and might be itself injurious. Those grounds are held to be sufficient for the purpose of the prosecution; but it may be suggested that there is another, still more cogent. The article in question is "a preparation of opium," and as preparations of opium are poisons within the meaning of the Act, the article to which the Derby case relates is itself a poison "pure and simple." Consideration of that circumstance would, we venture to think, have done away with the necessity for arguing questions as to poisonous effects, or as to the quantity of poison contained in the article; for preparations of opium are undeniably medicinal compounds in which opium is an ingredient, and by the second section of the Pharmacy Act it is provided that they are articles which "shall be deemed to be poisons." The proof that any article is a preparation of opium ought, therefore, to be sufficient evidence that it is a poison within the meaning of the Act, and that its sale is subject to the respective provisions.

### PHARMACY ACT PROCEEDINGS AT HULL.

On Thursday, at the Hull County Court, the case of the Pharmaceutical Society *v.* William Pattinson Hayton was re-heard. The case was originally dealt with on December 6, when the defendant did not put in an appearance in court, and evidence being then given to show that he, being an unregistered person, had sold a mixture of laudanum and soap liniment, a verdict was given for the plaintiffs, with costs on the higher scale (*ante*, p. 479). On the ground of informality on the part of the court officials, the defendant claimed to have the case re-heard, and at the second hearing, on Thursday, denied the sale. Ultimately, however, judgment was again given for the plaintiffs on the same terms as before, intimation of the fact being received just at the time of going to press. A report of the proceedings will be published next week.

### PHARMACY LAW IN SCOTLAND.

An important appeal case, a verbatim report of which will be found at page 760, was partly heard in the High Court of Justiciary, Edinburgh, on Monday last. The appellant, William Tomlinson, who was employed by Dr. Hugh Kelly, of Glasgow, was fined at the Glasgow Summary Court in November last for selling various poisons, he not being registered under the Pharmacy Act, and the Sheriff on that occasion remarked that it was a very bad case indeed (*ante*, p. 457). It is understood that the object of the present proceedings is to obtain an authoritative opinion whether the House of Lords' interpretation of the word "seller," and Mr. Justice Hawkins' judgment are to be held binding in Scotland. Otherwise, what is now an offence in England and Wales may be perfectly lawful across the border. The case is therefore of exceptional importance, as the judges have recognised by deciding to have the matter argued before a full bench.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual dinner of this Association was held at the Cannon Street Hotel on Thursday, when the chair was taken by Mr. T. H. W. Idris, J.P. Amongst the visitors were Mr. Michael Carteighe, President of the Pharmaceutical Society; Mr. N. H. Martin, President of the British Pharmaceutical Conference; Dr. Thos. Stevenson, Dr. A. P. Luff, Professor Greenish, Mr. F. Andrews, Mr. Richard Bremridge, and several other officers of the Pharmaceutical Society. The toast of the "Medical Profession" was proposed by Mr. E. H. Gane and responded to by Dr. Thos. Stevenson; that of the "Pharmaceutical Society" by Mr. C. E. Sage was acknowledged by Mr. Carteighe; success to the "Chemists' Assistants' Association" was proposed by the Chairman, thanks being tendered by Mr. E. F. Harrison, President of the Association; and complimentary allusions to the "Chairman and Visitors" were acknowledged by Mr. F. Andrews, President of the Western Chemists' Association (of London). The musical programme was contributed to by Messrs. Moncrieff, E. J. Wood, S. Jamieson, and Frampton, who were accompanied by Mr. Mackadam. The whole of the arrangements reflected great credit upon Mr. Gane, the acting secretary to the dinner committee, and the more especially so since he had, we understand, to undertake the duties at somewhat brief notice.

### ANNUAL DINNER.

A general meeting will be held in the Pharmaceutical Society's house, 16, Bloomsbury Square, on Wednesday next, March 14, to consider preliminary arrangements for the annual dinner of the members of the Society and their friends in May. The meeting will be opened at 11.30 a.m. precisely, and it is hoped that those willing to assist by acting as stewards, if unable to attend on this occasion, will previously intimate their willingness to act to the President, Mr. Michael Carteighe.

### EVENING MEETING IN LONDON.

The chair will be taken at the evening meeting on Wednesday next, March 14, at 8.30; that is, half-an-hour later than usual. As already announced, Professor Dunstan will then lecture on "The Nature of Aconitine."

# Transactions of the Pharmaceutical Society.

## MEETING OF THE COUNCIL.

*Wednesday, March 7, 1894.*

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

MR. WM. GOWEN CROSS, VICE-PRESIDENT.

Messrs. Abraham, Allen, Atkins, Greenish, Grose, Hampson, Hills, Martin, Martindale, Newsholme, Schacht, Southall, and Young.

The minutes of the last meeting were read and confirmed.

### THE LATE MR. R. H. DAVIES.

A letter was read from the brother-in-law of the late Mr. R. H. Davies, written on behalf of his sister, the widow, thanking the Council for the resolution of condolence recently passed.

### ELECTIONS.

#### MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Brown, James | Ampthill. |
| Hendry, Alex. John Garden | London. |
| Low, Robert | Malvern. |
| Norwood, John Percy | Wath-on-Dearne. |

*Chemists and Druggists.*

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Dickinson, Frederick | Stamford. |
| Forshaw, Thomas Garratt | Bradford. |
| Strachan, Thomas Craig | Carrickmacross. |

#### ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Anderson, George Watson | Forres. |
| Beach, Thomas Edgar | London. |
| Conley, Thomas | Auchtermuchty. |
| Connochie, James | Selkirk. |
| Fraser, Alexander | Forres. |
| Goode, Chas. Edwd. Adams | Hastings. |
| Merrick, William Stephen N. | Walworth. |
| Powell, Frederick William | Camberwell. |
| Robinson, G. Walton Gibson | Brighton. |
| Rowland, Leonard Bromfield | Wrexham. |
| Stephens, Albert Francis H. | Camborne. |
| Stratford, Horace Oliver | Kensington. |
| Ward, Walter James | Conisborough. |
| Wood, Uriah | Arnold. |
| Woolls, Victor John | Margate. |

#### ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Bell, John | Dumfries. |
| Chorley, Cleasby | Kendal. |
| Hill, Blair | Edinburgh. |
| Lindsay, Robert Macintosh | Dundee. |
| Noble, John G. Barrington | South Shields. |
| Roberts, Thomas William | Holyhead. |
| Tod, James Arnold | Edinburgh. |
| Williams, Roger Matthew | Abergavenny. |

#### STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Bell, Arthur Henry | Mansfield. |
| Betts, William Maydwell | Towcester. |
| Blyton, John Henry | Manchester. |
| Chapman, Frederick Thomas | Crowle. |
| Davies, David Thomas | Portsmouth. |
| Doig, William, jun. | Dundee. |
| Epton, James | Spalding. |
| Findlay, Alexander | Cullen. |
| Floyd, Harry Victor | Soham. |
| French, Thomas | Clevedon. |
| Gunstone, Herbert Challiner | Oxford. |
| Hartland, Charles | Oldbury. |
| Hill, John | Hawick. |
| Jenkins, Morris William | St. Clears. |
| Jones, Noel Crossley | London. |
| Kellam, Edward Kenny | Stamford. |
| Lewis, Frederic | Shrewsbury. |
| Mundy, John Frederick | London. |
| Phillips, John G. | Spalding. |
| Renouf, Fred | Jersey. |
| Thomas, Herbert Charles | London. |
| Thompson, Edgar | Cartmel. |
| Trotter, George Clark | Edinburgh. |
| Veitch, William Cuthbert | Bishop Auckland. |
| Warren, Frank | Southwick. |
| Westlake, Walter Vincent | Melksham. |
| Wilson, Archibald Ralph | Bishop Stortford. |
| Wise, Walter Frederick | London. |

### ADDITION TO THE REGISTER.

The REGISTRAR reported that—

Thomas Garratt Forshaw, 22, Fountain Street,
Bradford,

having made a declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported, his name had been placed on the Register.

### RESTORATION TO THE REGISTER.

The names of the following persons, who had respectively made the required declarations, and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

John Titus Newton, 202, Moseley Road, Birmingham.
John Hugh Davies, Church Hill, Sydney, N.S.W.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

### REPORT OF THE FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended the payment of sundry accounts. It also recommended that a sum of £1000 be placed to the credit of the chairman of the Executive of the North British Branch on account of the new buildings.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. There was nothing calling for special notice with regard either to the receipts or payments. It was recommended that £1000 should be placed to the account of a separate building fund in Edinburgh, with a view to paying, as might be required, the architect and contractor for the work now being done. It was considered that this would simplify the accounts both in London and Edinburgh. About £800 would be required in a short time, £400 at once. The works were proceeding very satisfactorily; the chairman of the Executive and his committee were taking the greatest possible care in supervision, and they were ably assisted by the indefatigable assistant-secretary, Mr. Hill. When the building was finished, in spite of certain difficulties which had occurred, especially with regard to the question of water, although the floor would be relatively low, it would, with the precautions which were being taken, give them a building absolutely dry and fit for keeping apparatus in and for other purposes. The usual accounts would be presented in due course, the present proposal being simply to transfer a sum of money from London to Edinburgh for a special purpose. With regard to the Benevolent Fund, the subscriptions had amounted to about £100. They would no doubt be much larger during March and April, but he hoped local secretaries would not forget that special efforts would be required even to keep up the standard of last year. More money was wanted, and he was sanguine enough to think that they would be able by degrees to arouse their friends who did not subscribe to do so, and so awaken a greater interest in those who did. If necessary, some might see their way to slightly increasing their subscriptions, and even five shillings additional from a large number would produce a considerable effect. He was not begging—only asking that the members should be reminded of their duty. A sum of £9 8s. 10d. had been received as a donation to the Fund from Mr. Woolley, President of the Manchester Pharmaceutical Association, as the balance of proceeds arising from a ball which had been organised under the direction of Messrs. Kemp, Blackburn, Beyton, Butcher, Johnstone, Vallance, and Westmacott, and proved very successful.

The resolution was agreed to unanimously.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow (aged 44) of a member and subscriber, whose husband died in 1880, leaving her with three children. After continuing the business for some time she was obliged to sell it, and has since supported herself by nursing. (London).

£15 to the widow (aged 41) of a registered chemist and druggist who has had three previous grants. She carries on a small confectionery business. (London).

£15 to the widow (aged 63) of a member who has had three previous grants, and was an unsuccessful candidate at the last election. (Herts).

One other case was not entertained.

The Secretary had reported the death on February 14 of James Pearce, aged 70, who had been an annuitant since 1891.

The Vice-President (as Chairman of the Committee) in moving the adoption of the report and recommendations, said the business on the previous day was of purely routine character, and called for no special remark.

Mr. Atkins, in seconding the motion, wished to emphasise the remarks made by the President with regard to obtaining additional subscriptions. He was satisfied that almost the only way to increase the income of the Fund was to adopt the advice of the President. It was simply by personal appeals that the great majority of the subscriptions were obtained. Many men waited to be asked, but many who hesitated to subscribe to the Society never hesitated to subscribe to the Benevolent Fund, the catholicity of its operations appealing very strongly to everyone. If local secretaries would simply ask for small contributions they would succeed in most cases. His experience was that if small subscriptions were asked for, many would not only be willing, but feel it an honour to contribute.

Mr. Grose said he had great pleasure in emphasising what Mr. Atkins had said. It only wanted a little personal effort on the part of the local secretaries to increase the subscriptions considerably. He always met with the greatest courtesy, and he felt sure that chemists and druggists generally would respond to an appeal with the same open hands that those in his neighbourhood did.

Mr. Young said his experience was that local secretaries received a great deal more courtesy than cash. Out of ten or twelve visits he only succeeded in extracting donations from two, who, he believed, would continue them in future; but his impression was that the majority, so far from feeling it an honour to subscribe, regarded it as a thing to be shirked if possible. He found that, practically, members of the Society were the only ones from whom he got anything for the Benevolent Fund.

Mr. Grose said that was not his experience. He found much less difficulty in getting subscriptions to the Fund, which was acknowledged by all people on the Register as an excellent Fund, than in getting them to subscribe to the Society. Many of them did not like the Society, but the Benevolent Fund no one could say anything against.

The President hoped that local secretaries would not be discouraged too much by what Mr. Young had said. Of course, these were bad times, and he hoped none of them would throw up the sponge because they were not so successful at first as they hoped. He would also remind them that it was possible to collect at any time in the year, not only in March, and he believed Mr. Grose and some other secretaries had found it was very useful to take another member with them when calling to ask for subscriptions.

The motion was put and carried unanimously.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| January. | Day | 451 | 22 | 9 | 17 |
| | Evening | 205 | 16 | 2 | 9 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| January . . . | 203 | 123 | 80 | £0 19s. 1½d. |

Donations to the Library had been announced (*Pharm. Journ.*, February 17, p. 672), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

*For the Library in London*—

Schenk, Elements of Bacteriology, 1893.
Trimble, The Tannins.
Bolton, Bibliography of Chemistry.
Vines, Students' Text-Book of Botany.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| January. | Morning | 439 | 29 | 4 | 16 |
| | Evening | 56 | 9 | 1 | 2 |

Donations to the Museum had been announced (*Pharm. Journ.*, February 17, p. 673), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The staff of the Society's school had attended and reported on the various classes.

#### *School Prizes.*

The Committee had considered a draft scheme which had been submitted by Mr. Schacht for modifying the system of awarding prizes to the students. The scheme had been laid before the staff of the school, and a letter was read from the Dean expressing the unanimous opinion of the staff that its adoption was undesirable. Professor Green, Professor Greenish, and Mr. Ince had attended and conferred with the Committee, and after full consideration, the Committee had felt unable to recommend the adoption of the scheme.

*Code of Ethics.*

The Committee had again considered the desirability of formulating a code of ethics as suggested by a resolution of the Chemists' Assistants' Association, of November 2; a further communication from the Association relating to the same subject was also considered. The Committee had eventually concluded that at the present time the formation of a code of ethics, as suggested, was not practicable.

The PRESIDENT moved that the report and recommendations of the Committee be received and adopted. Beyond the usual routine work there were two subjects considered at the last meeting on which definite recommendations were made. Mr. Schacht, whose interest in all educational matters was well known, had framed a scheme for consideration somewhat on the lines of what was now carried on at University College, Bristol, whereby the students should be classed as they were at the University, and each student who obtained a position in either the first or second class was to receive a certificate to that effect. It was suggested by Mr. Schacht that certain disadvantages arose from the award of a good many medals during one session to the pupils, and that it was sometimes disheartening, to say the least, that nearly all the medals fell into the hands of one very successful and hard-working student. The Committee considered the matter with great care, and with the assistance of the staff, and while appreciating the good points of Mr. Schacht's scheme, and believing that probably in days to come some such plan would be adopted in most teaching institutions, it was felt, notwithstanding, that there were serious objections to adopting it at present in the Society's School of Pharmacy. One observation of considerable moment, which was quite new to him, was brought to their notice by a member of the staff, that a certain number of young men objected to being classed in the second class, and that many students would not go into an examination unless they felt quite certain of getting into the first class. He thought it rather curious that such an observation had been made, but he had made inquiries elsewhere, and found that amongst the class of students who entered pharmacy that feeling was shared in other parts of the country as well as in London. With reference to the second recommendation, the Council would remember that the Chemists' Assistants' Association had some interesting discussions, and passed certain resolutions with regard to a code of ethics. The Committee had had this subject under consideration on three different occasions, and felt that with the present limited powers which the Act conferred, and the difficulty of doing anything to increase those powers by any ordinary bye-law, it would be impossible to make any recommendation in that direction. The main points taken in the discussion were such as to command the sympathy of all right-minded men, and it was a good omen for pharmacy that amongst the younger generation there was a strong desire to take a high view of their individual position. He had often said that he cared not what he was called, whether tradesman or professional man, but that, in fact, one could raise any form of trade to the dignity of a profession by ethical means, by rules of conduct, and ability, and he only hoped that those who had set up this high standard of conduct would be able to maintain it during the whole of their lives, and so to influence their fellow men. It must be borne in mind, however, that there were objections to nearly all codes when the power of getting one's living was interfered with by it. No doubt it was very undesirable that there should be no power in the Pharmacy Act to enable the Society, with the consent of the Privy Council, or the Privy Council itself, to strike a man off the Register for misconduct, using that word in its widest sense; but the subject was not free from difficulty. The striking off of a person from a register for any form of misconduct such as that to which reference was made was exceedingly difficult to carry out in practice. Even the Medical Council had found the greatest difficulty in dealing with it, and they had really to sit like judges in a court of law, and to hear the argument by counsel on behalf of the person accused. In many cases they felt themselves bound in justice, or in benevolence, to re-register a man after a certain period, when, in fact, he had purged his offence. Misconduct such as would enable them under the powers of an Act of Parliament to strike a man off the Register was generally of such a kind as could be dealt with by the ordinary common law, but there were a great many minor offences, to which no doubt their friends alluded, which were not breaches of the common law, but breaches of what would be held in a strict professional sense to be proper conduct. He knew of no code which was carried out strictly, except that which existed in connection with the Royal College of Physicians in London, and doubtless in Edinburgh and Dublin as well, and the code of ethics and conditions under which a man retained his position at the Bar. Now it was important to remember that this code was rendered effectual simply because on admission, either to the Bar or to the Royal College of Physicians, the member practically signed an agreement that he would conform to everything laid down in the code. He mentioned this to show that in order for any such code to be effectual each person who joined the body must himself contract to be bound by its regulations. In the medical profession strictly so-called there was no code of ethics such as their young friends referred to. It did exist in the College of Physicians, and there was power to strike a man off the register for what was called infamous conduct in the professional sense; but there was nothing in the Medical Act, and nothing recognised amongst the profession at large, which corresponded to what the College of Physicians carried out amongst its own fellows. There were various questions with regard to fees, and as to what was right or wrong towards a brother practitioner, but those were really all things upon which there was no code in general medical practice; and even considering the great advance in the education of medical men during the last thirty or forty years, he thought pharmacists might feel satisfied that they were not very far behind medical men at the present moment. In the course of time he believed there would spring up a strong feeling on the part of members and associates of the Pharmaceutical Society and the general body of the trade in favour of some code amongst themselves, which would tend to place them in a better position towards each other, and to ensure to each one who followed the code the respect of the medical profession and of the public.

Mr. HAMPSON, in seconding the resolution, said it was with much regret that the Committee felt itself unable to accept the proposal of Mr. Schacht. They all had considerable sympathy with the important idea contained in his proposal, but the whole scheme seemed too drastic; in fact, it would be impossible, he thought, with proper regard to the interests of the school, to carry it out at present. The time might arrive when such a step might be taken, possibly when there was an enforced curriculum, but there were many considerations to be thought of before it could be adopted. With regard to the proposal of the Chemists' Assistants' Association, he thoroughly agreed with the remarks of the President. It was very gratifying to find that the younger members of the trade had met together to consider what was right and just with regard to their calling, and the discussion would certainly have important effects; the very fact of such a discussion taking place was in itself very important, but to carry it out in its entirety it would be necessary for the Society to obtain greater powers, and he was quite sure that no Parliament would give the powers which would be necessary in order to strike off the Register anyone who disobeyed the ethical code. Beyond that he very much doubted whether it would be just to deprive a man of his means of livelihood, even for what might be termed an infamous transaction with regard to his business. In many cases greater harm would be done by depriving a man of his means of living, and the result would be far worse than a continuance of such conduct. At any rate, it was practically impossible at present to attempt anything of the sort by means of legislation.

Mr. SCHACHT said he must admit to feeling some disappointment at the verdict given against him by his colleagues, as he understood unanimously, but he was not altogether unaccustomed to that kind of experience, and this being a subject which was not of gigantic importance, and would very well bear postponement, he was not much hurt at the result. He was glad to find that both the President and the Treasurer had intimated that possibly some improvements in the direction he had indicated—he was sorry to hear it called a scheme—might possibly be considered on a future occasion, or, at any rate, that the matter was not finally and absolutely closed. He should have been glad to hear, however, that the points on which he had suggested improvement might be possible had been a little more considered with a view to their rectification. These complaints did not by any means originate with himself. For instance, he had heard it said over and over again that it was a little unfortunate that so many awards went into the hands of one or two persons, and that was one of the reasons which led him to suggest a plan by which that objection might be overcome. He had also heard it suggested before that it was a pity to give the Society's medal to a man who had only attended a five months' course of lectures, and he rather regretted that if the Committee did not see its way to accepting his suggestions as a whole, a little more attention was not paid to meeting these two points. The President's observations were very kind and courteous, but he had made a trifling mistake in saying that his scheme was in imitation of what was done at University College, Bristol. It was framed, not with reference to that College, but with reference to the general practice at universities and, in a very large measure, at other colleges which went with the times, and in accordance with the general ideas prevalent at the universities. The tendency not only at the universities, but also at a large number of teaching institutions, was not to give rewards to one or two conspicuous men, but rather to place the men in classes, as he proposed, and to let them take the credit—and it was a credit—of being placed in the same class as the best man of the year. It was a great credit for No. 25 to be in the same list as No. 1, whoever he might be, especially if his real place could be given by marks. He, in common with many others, believed that it was impossible by any system of examination to make it quite clear and plain that one man was worth 1000 marks and another only 920, or something like it. There was only one subject on which that could be done with any degree of accuracy, and that was pure mathematics. It could not be done in science, and consequently the more just method of recognising work and knowledge was to group the men very much according to the degree in which they approached excellence, comparing one with the other. That was the foundation of his suggestion that men should be classed in groups rather than distinguished by the award of a prize, a medal, or certificate in each class. It seemed, however, that the professors were all banded together to maintain things as they were, and therefore they must submit; but, in his view, the Council should determine on its own plan, and the professors should be required to agree to it. Of course, it was only right to obtain their opinion, and as their opinion was dead against it, it must for the present be postponed. He had been much surprised at another observation of the President in explaining the action of the Committee, viz., that, as he had heard, students objected to being placed in the second class. He should have thought that that very feeling would be a stimulus to them, and make them exert themselves to get placed in the first instead of the second. He also remembered one of the professors telling him that his scheme did not offer anything fresh to the students, because they gave them these very certificates at present, that he gave his students a first, second, or third class certificate if they wished; and he seemed to think that such a certificate was exactly the same as a class certificate offered by the Society and endorsed with the name of the President. It might be so, but here seemed a strange contradiction. These certificates were given by the professor, and they were told by the President that a large number of students would not have them; that it was a disgrace not to be in the first class. He could not see it, nor did the thousands of men see it who each year took a second class at the various universities. They were very glad to get a second class, though of course they would rather be senior wrangler or senior optime. He held it was a blunder to say that men would not be content to take such rewards rather than nothing. Of course it was no use discussing the matter after it had been settled, and he must apologise for occupying the time of the Council so long upon it.

The PRESIDENT said Mr. Schacht had, he thought, slightly misunderstood him. He said he was struck with the observation which was made that some men objected to a second class certificate; he did not say he approved of it. Mr. Schacht's arguments were unanswerable in so far as they affected university degrees, where you had competitors desiring, or being compelled under certain circumstances, to attend an examination for a degree, but the great difficulty in a school was to get all the class into the examination room at all. It was stated by one of the professors that there was a distinct objection on the part of the classes even to the lecturer giving certificates, and that it had a tendency to keep men out of the examination room. He did not use that as an argument because, as Mr. Schacht said, when you had a complete system on that basis, it was obviously a much greater honour to a student to be placed than to have no place at all. But there were many arguments of various kinds which weighed against the operation of such a system in a school. If the Society were like a university, a classifying body on the basis of a curriculum, having different schools throughout the country affiliated to it, and the students coming up year by year with a view to having their attainments classified, there was no question that some such plan as Mr. Schacht had suggested would be the right thing, and it would be a tremendous stimulus to education; but they had to consider how far if the system were changed students would be attracted to the School. The desire was to give as good an education in pharmacy as possible, and no expense was spared to that end, and of course they wanted to attract students. The system adopted in other institutions had to be considered in discussin questions of this sort. A large number of parents did not understand the importance of a thorough education for their sons on entering pharmacy, or what conditions they would have to fulfil in order to be successful in it; and it was not always easy to persuade parents of the importance of their sons attending that school, or some other high class institution of the same kind, where they would have to undergo a definite course of instruction. There was a feeling on the part of the Committee that these proposals, if adopted, might have an effect not altogether advantageous in that respect, and there were other points of detail which could not very well be discussed in Council. The difficulty was, in short, in applying an important scheme of this kind which suited a university to a comparatively small school. He mentioned the University College, Bristol, in connection with it, because he looked upon that as a kind of school, and he thought one of the strongest arguments Mr. Schacht could have used was that this plan had been found to work well there. A large part of his argument, however, rested on the experience at the universities, where men were only too anxious to present themselves for examination with the view of obtaining a degree; but in that school and others there was always a tendency to be indifferent to the examination room unless the student felt great confidence in himself. The question had to be considered from the students' point of view. Men of mature age could hardly see a number of points which occurred to younger minds in such matters; but from inquiries amongst young people it seemed pretty obvious that the charm, the distinction, which attached to a medal in his younger days still clung to it in the minds of the young men. No doubt they ought to be taught better, but as long as the feeling existed it had to be taken account of by any school committee. He should be glad if in another generation they had a general system of education throughout the country based on a curriculum, and they might then be able to classify the students somewhat on the lines Mr. Schacht proposed.

Mr. **Atkins** said anything suggested by such an old educational reformer as Mr. Schacht must receive the most careful attention, and he was quite sure that he would feel satisfied for the moment with that consideration by the Committee, because if it were true, as he intimated, that the whole drift of university work at the present day was in the direction of his views, he could well afford to wait, for if the time were not yet quite ripe for the adoption of his views, it must inevitably come by the process of evolution. With regard to the question of ethics, he thought they were all at that table familiar with the distinction between regulations and recommendations, and he hoped the Chemists' Assistants' Association, on reading the President's remarks, would draw that distinction. He felt himself that whilst the suggestions made could not be adopted as regulations, they had great weight as recommendations for the future. But he would ask, was not there a distinction between registration and membership? The Treasurer had very properly called attention to the very serious hardship it would be to deprive a man of the means of obtaining his livelihood for violating an ethical code; but it seemed to him there was an important distinction between registration which gave the right to carry on business and an ethical code which would govern the *esprit de corps* of the members of the Society. He would very strongly support the views which the Chemists' Assistants' Association had formulated, for they were all unfortunately familiar with the fact that there were at times transactions on the part of members which could not be considered right from an ethical point of view; and it was a question whether they should not endeavour to raise the tone of the body by having a code of morals. He wished to ask whether there would be any injustice in formulating a code of ethics which should be required to be signed by anyone joining the Society as a member?

The **President** said of course it would be quite competent for the Society to devise a code of ethics, but the point he wished especially to insist upon was this, that as the Society was incorporated by Act of Parliament, and there were certain rights and privileges granted to registered persons, it was a question how far they could insist on the signing of a document, that would be binding under such a code, without distinct statutory authority. Although they called themselves a voluntary society their charter was confirmed by the Pharmacy Acts, 1852 and 1868. It was thus provided that every person upon the register of chemists and druggists should be eligible to be admitted into the Society, and he thought the law would hold that they could not put any serious restrictions on any man who wanted to come in. It would be impossible, he believed, even to frame a scheme for the Society without specific Parliamentary powers. Many of their brethren considered association with the Society as a passport to public confidence, and he felt certain that if they asked a man who was eligible to be admitted, one who had been in business before 1868, or who had passed the Major examination, to sign a declaration that he would be bound by this code, and he declined to do so, he could probably go to the courts and compel the Society to admit him. He certainly thought it would require a clause in the Act of Parliament authorising them to make such regulations for the admission of members, associates, and students, as the Council for the time being thought proper, and that no one should be so admitted unless he signed an undertaking that he would be bound by the regulations.

Mr. **Allen** said he rather hesitated to speak on the subject of education when he was in disagreement with such a champion as Mr. Schacht had been all his life; but as it unfortunately happened that Mr. Schacht was unable to be present at the time the discussion took place in the Committee on the subject of his suggestions, he should like at any rate to convince him that he had arrived at a decision on the matter altogether independent of the testimony brought forward against it by the professors. He understood Mr. Schacht to say that if the professors were banded together to oppose reforms, they would not take place as rapidly as might be wished; but in his opinion the Committee had arrived at a decision in this case, of course after considering what the professors had said, but to a great extent independent of their opinion. He was not at all surprised to hear what the President had stated that morning as to the objection which students might have to being put into a second class; but, on the other hand, he had a very strong feeling against placing such a student in the first class. As a member of the Council responsible to some extent for changes of this kind he objected, under the present condition of things, to place any man in the first class in chemistry after simply attending a course of lectures. He objected to the whole idea, at any rate until they had an opportunity of watching a man during three or four years' curriculum. The medal was a prize, and might be thought a great deal of, but it was simply a personal possession, and there was an end of it; a class was something which followed a man all through his life, and he objected, in the present condition of things, to making any such change. With regard to the objection to one man taking a large number of prizes, he did think a little re-arrangement of the present regulations might prevent that, and he hoped by-and-by some means might be devised for at any rate making the competition a little more open, and so possibly giving a better chance to a larger number of men.

Mr. **Hills** thought it was a matter of great congratulation that the Chemists' Assistants' Association, which was one of the younger societies connected with pharmacy, should have taken the question of ethics into consideration; in fact, it was one of the bright spots in the present horizon, which was perhaps a little gloomy in many respects. He thought they would see, after the remarks made by the President and others, how impossible it would be to frame any code which would be in any sense compulsory. Still, the more these matters were discussed among different bodies interested in pharmacy, the more likely they were to attain the object they had in view, and he hoped the younger men who had such high ideals would be able in after life, when they got a little more into the stress of competition, to maintain those high ideals which every one round the table regarded as being so very desirable.

Mr. **Martindale** said he was very sorry that Mr. Schacht was not able to be present at the meeting when his suggestions were discussed. He agreed with Mr. Allen that from one point of view a first class certificate in chemistry given from such a small school was too great an honour for those who passed through a session of even five or ten months. Still, the great thing was to encourage the students to emulate each other. They placed each other far better than anyone could place them in an examination; they knew each other's knowledge and where they fell short, and it was astonishing how they would judge each other, provided they mixed freely together, as they should in any school, as by that means they to a great extent educated each other. That led to mutual emulation, which ought to be encouraged, and he thought the present system did that to a certain extent. It was too small a school to be divided into two classes, and, on the whole, he believed the present system was better than the one Mr. Schacht suggested.

Mr. **Abraham**, whilst supporting the view of the Committee, had considerable sympathy with what Mr. Schacht had said with regard to the number of prizes going to one man. It was a great pity that could not be discouraged in some way. Possibly it might be desirable to have a one-man-one-prize rule, in which case it might be advisable to increase the value of some of them. With regard to giving medals for a five months' course, he could not agree with Mr. Schacht. He was himself placed in the position of only being able to attend a five months' course because he had studied elsewhere, and at the time he felt it a great hardship, and he could not go in for a ten months' medal, which he thought he might have a chance of obtaining. With respect to a code of ethics, he thought the President's remarks rather cut both ways. He pointed out that barristers and the College of Physicians had certain legal powers which enabled them to enforce a code of ethics.

The **President** said it was not a legal power; the man contracted himself to obey the code.

Mr. **Abraham** said, nevertheless, the whole medical profession had a code of ethics which was recognised almost universally, and by which they were very largely bound. He regretted that nothing could be done to help forward this movement. If a code were adopted, whether there were any means of enforcing it or not, it would have weight according to the source from which it emanated, and if it came from the Pharmaceutical Society, or from the British Pharmaceutical Conference even, it would have a greater influence. Some day he hoped the thin edge of the wedge would be put in by the drawing up of such a code, even if there were no powers of enforcing it.

The **President** said he admitted that the medical profession did individually observe a certain kind of code, which each man formed for himself, or obtained from those associated with him, but there was no written code for the profession as a whole. By writing to the professional journals and by getting the opinion of medical societies of various kinds, there was obtained a sort of unwritten code which a large number of the profession followed, but a great many had no code at all, and a great many things were done which from a professional point of view ought to be deprecated. If he were not mistaken, in several large towns there were small bodies with some such name as Medical Ethical Association; and it always seemed to him that both with respect to medicine and pharmacy a code of ethics could be best arranged by a local association. He must repeat that the medical profession as a whole had no definite written code of ethics, and he held it would be exceedingly difficult to make such a code.

The motion was then put and carried unanimously.

### THE ANNUAL MEETING.

It was resolved that the annual meeting be held on Wednesday, May 23. It was also resolved that the preparation of the Annual Report be referred to the Library, Museum, and School Committee.

### LOCAL SECRETARY.

Mr. Thomas Higham was appointed Local Secretary for Lewes, in the place of Mr. Saxby, retired through illness.

### INTERNATIONAL MEDICAL CONGRESS.

The **President** said the International Medical Congress, which was to have been held in Rome last September, but was deferred in consequence partly of the prevalence of cholera in some parts of Europe, was now fixed to take place from March 29 to April 5. He had received an invitation from the Secretary, inviting the Society to send delegates to the Congress, and if any members of the Council of the Society were thinking of travelling in that direction, the Council could appoint them, but it was necessary the names should be sent in shortly. He regretted that he should not be able to attend personally, as his presence would be officially required in Edinburgh at that time.

After a short discussion it was resolved that the President be authorised to appoint two members of the Society as delegates to the Congress.

### INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

The **President** said he had also received an invitation from Professor C. Muller, the Secretary of the Eighth International Congress of Hygiene and Demography, which was to meet in Buda-Pesth from September 1 to 9, asking for the names of delegates who would attend the Congress. He proposed to acknowledge the invitation, and say that later on they hoped to send the names of delegates. The neighbourhood of Buda-Pesth was one of the most beautiful in Europe, and he hoped one or more members of the Council would be able to attend.

### REPORT OF GENERAL PURPOSES COMMITTEE.

This report included the usual letter from the solicitors as to cases placed in their hands. In several cases judgment had been recovered, in others the penalty and costs had been paid into court, and some are still awaiting a decision. Several fresh cases of infringement of the Pharmacy Act were reported to the Committee, and it was recommended that the Registrar be authorised to take proceedings.

This report was read and considered in Committee.

On resuming, the report and recommendations were unanimously adopted, and a resolution passed, authorising the Registrar to institute proceedings against the persons named.

## EVENING MEETING IN EDINBURGH.

*Wednesday, February* 28, 1894.

MR. J. LAIDLAW EWING IN THE CHAIR.

The fourth evening meeting in Edinburgh of the present session was held in the Society's House, 36, York Place, on Wednesday, February 28, at 8.30.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Dr. Stockman, and Messrs. Boa, Fraser, Gibson, Henry, and Stephenson.

The following communication was then read:—

### THE ACTION OF PAPAIN ON EGG AND SERUM ALBUMIN IN ACID AND ALKALINE SOLUTIONS.

BY GORDON SHARP, M.B. EDIN., LEEDS.

*Late Research Student in Pharmacology in the Owens College, Victoria University, Manchester.*

In reference to my paper on "Papain Digestion, etc.," read at the last evening meeting, and published in the *Pharmaceutical Journal* of February 3, 1894, in which I showed the total absence of peptone from the process, exception has been taken to my experiments because I used egg-albumin and not meat (serum) albumin, and regret has been expressed that I had not tried the action of the ferment in alkaline and in acid fluids. The reason I employed egg-albumin was because it may be said to be the standard proteid in all digestion experiments, and if one is to compare one ferment with another, for example, such a well-known one as pepsin, we have no resource but to employ egg-albumin. Other reasons are, it is easily obtained free from extraneous impurity, and it is difficult of digestion, and thus comparisons can be made. As to the employment of acids and alkalies, I have tried the action of papain in their presence and on many occasions, but did not publish the results, because they did not affect my general conclusions, which went to show the entire absence of peptone. Besides, when the native of the West Indies lays the split, unripe fruit of the papaw tree on meat, he does not add a pinch of sodium carbonate or a drop of hydrochloric acid, and my intention was to imitate this native as far as possible, only employing egg albumin instead of meat.

In the present research I carried on two sets of experiments, one with egg albumin, the other with serum-albumin carefully prepared from meat, all fat being removed, so that a light amber-coloured jelly was obtained. In each case papain was tried in neutral solution, in 0·0384 per cent. hydrochloric acid solution, and in 0·250 per cent. sodium carbonate solution, and in all cases one part of albumin, one-tenth part of papain, and 100 parts of water were employed, except, of course, where acid or alkali was used, in which case solutions of these took the place of water. The temperature of 35° C. usually observed was employed in all cases, and maintained for some hours. In no case was peptone present, trial being made both by the ammonium sulphate process and by dialysis, as explained in my former paper.

There are some points of error likely to occur in experimenting with egg and serum-albumins. Serum-albumin forms a much softer coagulum than egg-albumin, and is more easily acted upon by ferments of all kinds, hence when papain is mixed with it, it is quickly broken up. Egg-albumin, on the other hand, forms a hard coagulum, and papain affects only a small amount of it if mixed with the egg without the addition of any other thing. Any large amount of solution which goes on in the presence of alkali is in great part due to the presence of the alkali, and not to the ferment. Egg-albumin is acted upon by pepsin much more readily than by papain, but even with pepsin very little peptone is formed under the most favourable circumstances, the greater part of the solution being proteose, although many observers fall into error in mistaking proteose for peptone. Although during the past few years I have performed perhaps not less than one hundred digestion experiments with pepsin, I have been unable to produce any great quantity of true peptone, and in most cases only a distinct trace was found. The fallacy I fell into at first was in not exercising sufficient care. An easy method, as already explained in a previous paper, is to dialyse, but every care must be taken with animal membrane to have it thoroughly washed in cold water for some days, and finally in distilled water. Distilled water should be passed through and tested for proteids, because the membrane is difficult to free from alkalies, even when acidulated water is passed through it, from the fact of the interstices retaining lime which may be on the outside of the membrane, and so act upon it that a minute quantity of dissolved membrane passes into the water and may deceive the observer. Such an error has arisen in my earlier work on the proteids. Having obtained my membrane free from impurities, I next test its rate of diffusibility by observing how soon a solution of sodium chloride passes through, silver nitrate being the test employed. Now, peptone is almost as readily diffusible, but I give it double the time. After some hours, or after one hour, perhaps, albumose may or may not pass through, depending a good deal on the membrane, but the point to emphasise is that peptone is the only proteid that passes through an animal membrane with the same degree of rapidity as a soluble salt. Mention of another source of error must not be omitted. If an alkali is employed in digesting it soon passes through the membrane, acts on the outside, dissolving a minute quantity, but still quite enough to give a modified purple with the biuret, and may deceive the unwary, and it may also give a precipitate with phospho-tungstic acid, as would peptone.

In using ammonium sulphate I employ a salt, pure and recrystallised, so as to get perfect freedom from all particles of dirt. I place some of the dry salt in a tube, add the digested fluid, and shake at intervals for some hours, and then allow to stand over night, making sure that I have great excess of ammonium sulphate. In this way I generally manage to get all the proteids thrown out. Complaint is often made that after saturation still more proteid is thrown out, when more salt is added. I think this hardly occurs if my plan be adopted. However, it is possible that one may have a proteid nearer to peptone than even deutero-albumose, say a trito or a tetrato-albumose. This is more likely than that some of the soluble peptone is again changed into an albumose by its contact with ammonium sulphate, as has been supposed by W. Kühne ('Year-Book of Pharmacy,' 1893, p. 85). The supersaturated solutions of ammonium sulphate might precipitate them readily.

The whole subject relating to the proteids is one about which little is known. Even our knowledge of our best known ones, egg and serum-albumins, is scanty. The very fact that they retain the names given them so long ago shows how little is known about them. Egg-albumin forms an opaque coagulum, serum-albumin a transparent one when pure. The fact is both may not be albumins at all, but albuminates, in which the proteid plays the part of acid and a metal the base. The way in which the salts of heavy metals act towards albumins goes a long way to support this idea. If a solution of egg or serum-albumin has added to it a solution of mercuric chloride, a precipitate of what is called mercuric albuminate forms, replacing the soluble albuminate existing in the egg-white, but if to such a precipitate great excess of sodium chloride be added, the precipitate dissolves, and most likely a sodio-mercuric albuminate is formed.

The behaviour of egg and serum-albumins to different reagents bears out the notion that they are both albuminates. Egg-albumin is probably chiefly a calcium albuminate, hence alkali-albumins so-called prepared from egg-albumin are in my experience not nearly so soluble as acid-albumins prepared from the same, and I believe the calcium present in egg-white largely resists the action of papain, which belongs to the trypsins or alkaline class, but comparatively readily yields to pepsin even without added acid pepsin belonging to the acid class. Serum albumin, on the other hand, is probably a sodium albuminate, and hence the clear coagulum which it forms, and is so easily dissolved by such a weak ferment as papain, and without the aid of added alkali. Sodium albuminate is very soluble as compared with calcium albuminate. Gelatin is probably analogous to albumin, being the salt of calcium—really calcium gelatinate.

In conclusion, we may say papain is a ferment which acts on weak proteids, resolving them into soluble proteids, the final result being a proteose; the peptone stage is never reached. It need hardly be said the process is supposed to be one of hydration, and the same change can be brought about by the prolonged action of carbonic acid gas in the presence of water, the process being accelerated if a weak acid like lactic be present. Pepsin (and pancreatin very slowly) acts on the strongest proteids, and finally, but slowly and with great difficulty outside the body, transforming the sparingly soluble albumin into the highly soluble peptone. One could hardly expect papain to be on a level with pepsin, and Butler, sitting in his study and reasoning by analogy, might have come to the conclusions we have arrived at by experiment. Papain is a product of the vegetable kingdom, and the ferment possibly exists for the purpose of enabling the plant to break up vegetable albumin into soluble albumose, which has to pass through the simple vascular system of the plant. Pepsin is a product of the animal kingdom, and has for its final action the formation of peptone, which has to pass by osmosis through the animal membrane and into, not a primitive vascular system like that of the plant, but into the elaborate circulation, upon which is dependent for nourishment the complex nervous system of the animal.

Mr. Fred Davis, in his courteous criticism of my paper of February 3, 1894, appears to have missed some of the important points in it. He says the reason of my failure to find peptone may have been due to the samples I employed. Well, if he allows that the samples I used produced any digestive action at all (as according to my observations they did), then papain must contain more than one ferment, namely, one which digests proteids as far as albumose, and one or more which produce peptone. Of this we have no evidence, as far as our present knowledge of papain goes. He admits that some of the peptone he found may have been due to bacteria, and says it is remarkable that, seeing there is no evidence of my vessels being sterilised, I did not find peptone, also due to bacteria. Now, in the opening sentence of my paper I distinctly state that it is my contention that peptone does not occur apart from the presence of pepsin or pancreatin. Therefore I could not find it, even allowing for the action of bacteria in my experiments. In speaking of his work, what I meant was that he had allowed his fluids to stand too long (namely, some of them forty-eight hours), because bacteria so readily attack albumin, especially at 35° C., and as his paper deals with the amount digested (which could not be all peptone, even granting some were present), I think there was some justification for the remark that bacteria may have played a part. Digestion does not mean the formation of peptone, as many people appear to think; it may mean anything between acid or alkali albumin and peptone. It would be better if we were more careful in the use of this word, and we might with advantage adopt the cautious Scottish-like language of the British Pharmacopœia, which says, in dealing with the characters and tests of pepsin, "Two grains, etc., to which 100 grains of hard-boiled white of egg, etc., have been added, etc., will dissolve on their being well mixed, digested, etc."

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The next communication was on—

## THE DIGESTIVE ACTION OF PAPAIN AND PEPSIN COMPARED.

BY D. B. DOTT, F.I.C., F.R.S.E.

I have tried some experiments with papain and pepsin, as to their solvent and peptonising action on egg-albumin. The following may be noted :—

1. 100 grains albumin, freshly boiled and sifted, digested in 1 ounce water with 10 ♏ dilute hydrochloric acid, at a temperature of 98°-100° F., with 2 grains pepsin. Solution was nearly complete in an hour. After four hours, 1 drachm nitric acid, diluted with 3 drachms water, was added, the precipitate collected, washed, pressed gently in blotting paper and weighed in the moist state = 10 grains.

2. The same experiment in all respects, but that 7 grains of papain were used. The nitric acid precipitate (including undissolved albumin) = 103 grains.

3. 100 grains egg-albumin with 1 ounce water, 15 ♏ dilute hydrochloric acid, digested at 130° F. with 2 grains pepsin. Solution was nearly complete in fifteen minutes. After two-and-a-half hours the practically clear solution was mixed with 30 ♏ nitric acid, diluted with 2 drachms water. The precipitate collected and weighed, as above noted = 2½ grains.

4. The same experiment in all respects, except that 2 grains papain were used. After two and half hours the albumin was not nearly dissolved. It was collected and weighed in the moist state, = 70 grains. The filtrate from this precipitate was then mixed with nitric acid as above described; precipitate collected, etc., = 33 grains.

From these experiments it is evident that papain has only a slight solvent action on albumin at the temperature of the body, and practically no peptonising action. On the other hand, pepsin has a high power, both of dissolving albumin and peptonising the solutions. The higher temperature of 130° F. (as in the B.P. test for pepsin) increases the rapidity both of the solvent and peptonising power of pepsin, and likewise increases the solvent power of the papain.

Certain assumptions are made: 1st, that the pepsin and papain of two well-known makers are what they are represented to be; 2nd, that non-precipitation by nitric acid is a trustworthy indication of the formation of peptone.

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The Chairman said Dr. Sharp's paper contained some striking results, and would probably give rise to considerable discussion.

Mr. Duncan said Dr. Sharp's paper was a complete reply to the suggestion he had made at last meeting. He should say that he had in his mind at last meeting more what had been said by Mr. Gibson than what was in Dr. Sharp's paper. He observed that Mr. Davis, in the letter referred to, went even further than he (Mr. Duncan) had done, for while the animals in his story devoured the leaves, Mr. Davis alleged that it was enough if they stood under the shade of the tree.

Mr. Nesbit said he was a little surprised to hear that pepsin did not, except to a small extent, produce peptone. It was largely used as an aid to digestion, and they knew that it had a powerful effect in dissolving albumin. Some time ago he had a prescription for papain in powders, along with sodium carbonate. The patient asked to have them made up in mixture form with water, and when the bottle came back to be refilled it had a most offensive smell, showing that putrefaction had taken place. It evidently would not keep in alkaline solution, and he observed that Finkler recommended that it should be sent out in acid solution.

Mr. Rutherford Hill, in reply, said it was important to note that Mr. Dott practically confirmed Dr. Sharp's results as to the absence of peptone in papain digestion. With regard to what Mr. Nesbit said, he would point out that Dr. Sharp said we used the word digestion in a loose way. It only meant that the albumin was dissolved. None of it, or very little of it, might be in the form of peptone. The process of hydration might stop just short of peptone and give only proteose, but, nevertheless, the albumin would be dissolved or digested in the popular sense.

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The next communication was on

## THE CRYSTALS DEPOSITED IN LIQUOR STRYCHNINÆ HYDROCHLORATIS.

BY WILLIAM DUNCAN.

Through the kindness of Mr. Hill, my attention has been called to Professor Attfield's "Report on the Progress of Pharmacy for 1892," in which notice is taken of a paper of mine on 'Liquor Strychninæ Hydrochloratis,' read at an evening meeting here on March 30, 1892 (*Pharm. Journ.*, [3], vol. xxii., p. 843). Professor Attfield says:—"Duncan has shown that the reason why this solution is liable to deposit crystals in cold weather is because excess of hydrochloric acid is often employed, an acid hydrochlorate of strychnine less soluble than the neutral hydrochlorate apparently being produced."

At no time have I suggested that an acid salt is formed in this liquor, which being less soluble is deposited. In fact, in my former paper I went so far as to say that in my own opinion the deposited crystals were simply strychnine hydrochloride, a salt apparently less soluble in weak hydrochloric acid than in water. This statement was based on the two experiments I made, viz., that by the repeated additions of acid a "salting out" of the neutral hydrochloride took place, and that a determination of the combined acid gave 9·1 per cent., which agreed with the formula $(C_{21}H_{22}N_2O_2HCl)_2 3H_2O$.

In my original paper the formula $C_{21}H_{22}N_2O_2HCl.2H_2O$ is given. This is a mistake.

Three weeks after the reading of my paper, Dr. Paul followed with one on the same subject, read before the Society in London on April 23, 1892 (*Pharm. Journ.*, [3], vol. xxii., p. 880). He confirmed my results, but in addition made the statement that the deposit no doubt was an acid hydrochlorate of strychnine. He, however, gave no reasons for this assumption.

As Professor Attfield has apparently added Dr. Paul's statement to my results, the following experiments have been made to prevent confusion, and to confirm or disprove the formation of an acid salt in this liquor.

A quantity of strychnine was dissolved in water containing three times the amount of hydrochloric acid necessary to form the neutral salt, and allowed to crystallise. The crystals were removed and washed until free of adhering acid, and then dried for three days in a calcium chloride desiccator. It may be suggested that a decomposition of the crystals may ensue during the washing, but I could observe no evidence of such a change. Strychnine hydrochloride is believed to have the formula $(C_{21}H_{22}N_2O_2HCl)_2 3H_2O$, and Mr. Dott, in a paper on strychnine salts read before the Pharmaceutical Conference in Edinburgh on August 23, 1892, confirms this. I see, however, in the latest edition of Attfield's 'Chemistry,' $C_{21}H_{22}N_2O_2HCl.3H_2O$ is given—probably by a printer's error.

The salt has the following percentage composition:—

| | |
|---|---|
| Alkaloid | 84·025 |
| Hydrochloric acid | 9·182 |
| Water | 6·792 |

A determination of the water of crystallisation in the crystals formed in my solution was made by drying a portion in the water-bath, and then transferring to an air-bath at 110° C., until it ceased to lose weight.

·5356 gramme contains ·0363, found ·0338
·642 „ „ ·0436, „ ·044

corresponding to 6·606 per cent.

The hydrochloric acid was determined by titration of the salt with a weak sodium hydrate solution, phenolphthalein being used as an indicator.

·2794 gramme contains ·0256, found ·0249
·5048 „ „ ·0463, „ 0·468

corresponding to 9·143 per cent.

A similar estimation was made with silver nitrate, which gave similar results:—

·1816 gramme contains ·0167, found ·0171
·177 „ „ ·0162, „ ·017

corresponding to 9·509 per cent.

A check determination was also made on the anhydrous salt—

·606 gramme contains ·0597, found ·0597
·5018 „ „ ·0494, „ ·0499

corresponding to 9·893 per cent., while the anhydrous salt contains 9·848.

The strychnine was estimated by precipitating the alkaloid with ammonia and washing out repeatedly with chloroform.

·4697 gramme contains ·394, found ·389
·7 „ „ ·588, „ ·583

corresponding to 83·098 per cent.

The crystals readily dissolve in water, yielding a neutral solution, and (1·554 gramme of solution on evaporation left ·044 gramme) indicating a solubility of 1 in 35·31, at 15° C.

These results, I think, conclusively prove that although many acid salts of this alkaloid are well known to exist, the crystals formed in acid solutions of strychnine hydrochloride consist of the neutral salt, and not an acid salt, as has been assumed.

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The Chairman said there would probably not be much discussion on this interesting note, but they would leave it to Dr. Paul and Mr. Duncan to settle the matter between them.

Mr. Rutherford Hill said he was inclined to agree with Mr. Duncan's theory that this was a case of "salting out" the neutral salt. They had an analogous result in the case of a solution of barium or sodium chloride, from which chloride of the metal was thrown out on adding excess of acid to the solution. He had still the notes he made at the time Mr. Duncan read his original paper, and from these he found that the solubility of the neutral hydrochloride of strychnine decreased as the percentage of acid increased in the solvent. Two estimations of solubility in diluted hydrochloric acid B.P. (10·58 per cent.) gave a mean of 1 in 203.

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The meeting then proceeded with a discussion on the United States Pharmacopœia of 1890, a report of which will appear in our next issue.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, March 1, Mr. E. Brooke, F.C.S., Vice-President, in the chair. A paper on "Lead and its Salts" was read by Mr. H. Boyce, who described the various ores, the production of the metal, and its various applications, and the characters and uses of its salts, referring in greater detail to the production of white lead. The paper was followed by a discussion, in which the Chairman, Messrs. Tickle, Gane, Potter, and Hill took part.

Mr. A. C. Bateson then read a communication on the "Manufacture of Paper," tracing the development of the art from a remote period, and describing the machinery and processes now in use. The paper gave rise to a discussion, in which the Chairman, Secretary, Messrs. Browne, Henry, Wolstenholme, Boyce, Gane, Potter, and Cox joined.

After a brief discussion on miscellaneous topics the meeting adjourned.

## INSTITUTE OF CHEMISTRY.

The eighth annual general meeting of the Institute of Chemistry of Great Britain and Ireland (incorporated under Royal Charter), was held on Thursday, March 1, at the offices of the Institute, 30, Bloomsbury Square, London, W.C.

The annual accounts and the report of the Council for the past year were received, and Dr. W. A. Tilden, F.R.S., the retiring President, delivered an address, in which he referred to the progress of the Institute during the three years of his presidency.

The officers and Council for the ensuing session were elected, Dr. W. J. Russell, F.R.S., of St. Bartholomew's Hospital, succeeding Dr. Tilden as President of the Institute.

Notwithstanding the fact that the Institute has to lament the loss of eight members by death and fourteen from other causes, the number of members has increased by nineteen during the past year, and ninety-eight students have been admitted.

The register now contains 738 Fellows, 109 Associates, and 207 students.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on Thursday, March 1, the President, Mr. E. F. Harrison, in the chair, a paper was read on "Œsypum and Lanolin," by Mr. J. H. Heap, in which the author gave a historical account of wool-fat. The subject was dealt with in a very comprehensive and scholarly manner, and the paper gave rise to an interesting discussion.

# Provincial Transactions.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

At the meeting held on Thursday, March 1, Mr. T. H. Wardleworth, Vice-President, in the chair, after the usual preliminaries, Mr. R. C. Cowley, Ph.C., delivered an instructive lecture on "Milk Analysis." The chief adulterant of milk was water, usually determined by the lactometer, which is not a reliable test. The most satisfactory test is by the determination of solids and deduction therefrom of the percentage of pure milk. Fat may be determined by Adam's (Soxhlet) or Stokes's method. Chalk, starch, and colouring matters were easily detected. Boric and salicylic acids were sometimes found. The lecture was illustrated experimentally, and most of those present joined in the discussion which followed.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS IN SCOTLAND.

An appeal in the case of Bremridge *v.* Tomlinson was heard in the High Court of Justiciary, Edinburgh, before the Lord Justice-Clerk, Lord Rutherfurd-Clark, and Lord McLaren, on Monday, March 5.

Counsel for the appellant, Mr. Guthrie. Agents—Simpson and Marwick, U.S.

Counsel for respondent, Mr. Salvesen and Mr. T. B. Morison. Agent—P. Morison, S.S.C.

Mr. Guthrie: I appear for the appellant in this case. The question arises under the Pharmacy Acts of 1868 and 1869, and you will find the complaint on p. 6 of the case. The appellant is charged first with an offence under the 1st and 15th sections of the Act of 1868, in so far as, on or about July 28, 1893, not being a duly registered pharmaceutical chemist, or a chemist and druggist within the meaning of that Act, and within the premises in Glasgow occupied by Dr. Hugh Kelly, he sold a poison, to wit, a quantity of oxalic acid, and thereby became liable to a penalty of £5; and the second charge is in the same terms, the material being a prescription instead of a single poison. The Sheriff found that the following facts were admitted or proved: (1) the whole averments of fact contained in the complaint; (2) that the shop where the poisons were dispensed belonged to Dr. Kelly, who is a properly qualified and registered medical practitioner, and also a properly qualified and registered chemist and druggist; (3) that the appellant is not a duly registered pharmaceutical chemist, or chemist or druggist within the meaning of the Acts, and that on the two occasions libelled Dr. Kelly was not present when the poisons were sold, and the business was being conducted in his absence by the appellant.

Lord Rutherfurd-Clark: Is it impossible to buy oxalic acid?

Mr. Guthrie: You must buy it from a registered druggist, and we say that Dr. Kelly is a registered druggist, and he is the only person who *could have* been gone against if he had not been registered. They cannot go against his assistant, even though he was not qualified.

Lord Justice-Clerk: Do you mean that if it is sold by an unqualified person the master is the offender?

Mr. Guthrie: If any, and only if the master is himself unqualified. If the master is qualified there is no offence.

Lord Justice-Clerk: Do you mean the master could have done what the assistant did?

Mr. Guthrie: Yes, he could have sold.

Lord Rutherfurd-Clark: And there would have been no offence at all.

Lord Justice-Clerk: It comes to this, that the assistant did, in the absence of the master, what the master could have done himself.

Mr. Guthrie: Yes. Now, the first question put to your lordships is "whether in the shop of a duly qualified and registered medical practitioner his assistant—who is not a duly qualified and registered medical practitioner, nor a registered pharmaceutical chemist, or chemist and druggist within the meaning of the said Acts—contravenes the 1st and 15th sections of the Act of 1868, if, in the absence of the medical practitioner, he sells any of the poisons included in the schedule annexed to the Act?"—and that is really the question in this case. The second is whether in the event of the first question being answered in the affirmative the employer or his assistant is liable to the penalty.

Lord Justice-Clerk: The question is whether the conviction is good against the assistant.

Mr. Guthrie: Yes. Now the question turns substantially on the two Acts I have mentioned. The Act of 1868 is 31 and 32 Vict., cap. 121. I ask attention first to the preamble of the Statute.

Lord Rutherfurd-Clark: Before you read the preamble would you read the clause that creates the offence?

Mr. Guthrie: Yes, there are two clauses—Clause 1, which says, "It shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, etc."; and clause 15, which says, "Any person who shall sell, or keep an open shop for retailing, dispensing, or compounding poisons . . . . . shall, for every such offence, be liable to a penalty or sum of £5."

Lord McLaren: There is no penalty under the first clause.

Mr. Guthrie: No, the penalty is under the fifteenth. Now, first of all, I may tell your lordships that this Act bears to be an Act to regulate the sale of poisons and alter and amend the Pharmacy Act of 1852. The position of matters was this: that while in 1852 an Act had been passed prohibiting anybody from taking the title of pharmaceutical chemist, or any similar name, up to 1868 there was no restriction upon anybody opening a drug-store and selling drugs, including poisons, except that they were not to take certain limited titles. Then in the Act of 1868 the preamble, which is very important, is to this effect: that it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business, and, to that end, that from and after the date herein named, all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge, and so on. Your lordships will see that the object of the Statute was to provide that no person should keep an open shop who had not a certain qualification. The object was to see that they should possess a competent practical knowledge of their business, and to that end that from and after the passing of the Act all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge. In short, the Statute wanted to bring to an end the abuse that anyone might open a drug shop or carry on a drug business although he had no practical qualification whatever.

Lord McLaren: I thought the question was whether a conviction could follow if the fact was that the contract of sale was the contract of the shopkeeper, the assistant not being the seller under the contract, but merely acting as assistant. That is not raised in the first question at all. The question is whether it is lawful for an assistant to sell, which really one can only answer in the negative.

Lord Rutherfurd-Clark: I think it is whether it is lawful for an assistant of a registered practitioner to sell in that registered practitioner's shop.

Mr. Guthrie: That is so.

Lord McLaren: I should have thought there could be only one answer to that—that the answer must be in the negative—and that the question you want to raise is whether it is lawful for the shopkeeper to sell through the intervention of an assistant.

Mr. Guthrie: That is my first point.

Lord McLaren: The whole question is whether the contract of sale is made by the assistant or made by the master.

Mr. Guthrie: Your lordship sees we have the question raised generally in the third question—"whether in the whole circumstances of the case the conviction in question was justifiable." I may say, in the line of your lordship's observation, that what we wanted the Sheriff to put in was—"sell on behalf of Dr. Kelly."

Lord McLaren: The assistant clearly could not sue on that contract. Supposing the drugs were supplied on credit, would it be possible to sustain an action at the instance of the assistant?

Mr. Guthrie: We intend to maintain that under the proper meaning of the Statute the seller is the man on whose behalf the contract is made.

Lord Rutherfurd-Clark: In other words, that a registered practitioner may in his absence sell by an assistant who has not the necessary qualification for keeping the shop.

Mr. Guthrie: That is so.

Lord Rutherfurd-Clark: I assumed that was the question to be raised. All parties are anxious to have a decision on the matter, though it might have been framed to express it better.

Lord McLaren: I suppose we could put it into our judgment.

Mr. Guthrie: The case is in this position. So far as decision goes, there has been no decision in Scotland on this matter. There is a decision in England which is against me, and I propose to ask your lordships to look at the ground of that decision, which was arrived at in the Queen's Bench Division; but the matter arises now for the first time in Scotland, and for a very important reason—viz., that you have throughout the country a large number of doctors, and also in Glasgow a large number of doctors; doctors who have druggists' shops. These men are out visiting during the day, and for a part of the day they are in their consulting-room, which is behind the shop, seeing patients.

Lord McLaren: I thought a medical practitioner was not allowed to sell drugs.

Mr. Guthrie: In Glasgow, I am told, probably a majority of the druggist shops are kept by qualified practitioners.

Lord Justice-Clerk: Licentiates of the College of Surgeons. There may be restrictions on the part of the College of Physicians. A great number who are qualified do keep those shops, and that is the case in many country towns.

Lord McLaren: But the assistant must be registered under the Pharmacy Act.

Mr. Guthrie: And in most cases it would come to this, that practically the shop would be shut.

Lord Rutherfurd-Clark: Shut for poisons.

Mr. Guthrie: Yes, but as you know many prescriptions contain minute quantities of opium or arsenic or other poisons, and it would bring down the ordinary business of the druggist to a minimum if you prohibited the making-up of prescriptions except by qualified assistants.

Lord McLaren: It does not mean that he must be a medical practitioner, but only that he must be registered under the Pharmacy Acts as a man competent to dispense drugs.

Mr. Guthrie: Yes, he has to serve an apprenticeship and pass several examinations, and then he is registered under the Pharmacy Acts.

Lord McLaren: How is the apprentice to learn his business, because the first time he makes a sale he contravenes the Act?

Mr. Guthrie: That is so, and that is one of my points—that the person who is mentioned in the preamble is a person who is to possess a competent practical knowledge of the business. How he is ever to have that without practice as an apprentice in dispensing and compounding drugs which contain poisons, one does not see.

Lord McLaren: Perhaps he might do it with the right man looking over his shoulder all the time.

Mr. Guthrie: I am told it has gone this length, that unqualified men are regularly employed to do the whole business, but as matter of form a qualified assistant is there to take the parcel and hand it over the counter to the member of the public.

Lord Rutherfurd-Clark: That must be much more expensive?

Mr. Guthrie: You will understand that in a large shop they have qualified men.

Lord Rutherfurd-Clark: How do they do in Scotland in big shops.

Mr. Guthrie: They always have a number of qualified men.

Lord Rutherfurd-Clark: Of course, but it is not only they who sell.

Mr. Guthrie: I am told that the same formality goes on there.

Lord McLaren: Whenever it is a poison it must be a qualified man who sells it.

Mr. Guthrie: The unqualified man takes the order, compounds the medicine, and takes the money, but he hands the parcel to the qualified man, who hands it over.

Lord Justice-Clerk: That is an infinitely more dangerous state of things, because there you have an unqualified man saying he is not responsible, and he may do anything he likes.

Mr. Guthrie: We think there is no alternative between the view we submit, that the Act was limited to the persons who are the traders, and the other view that the whole process must be gone through by a qualified assistant—a view which has never yet been maintained, because in England the judges who saw the difficulty got out of it by suggesting supervision.

Lord Rutherfurd-Clark: I don't see what you suggest.

Mr. Guthrie: The other view is what is carried out—that everything may be done except the handing of the parcel over the counter. My view is that the Act only requires the shopkeeper to be a qualified person.

Lord Rutherfurd-Clark: And if the shopkeeper is a qualified person, every person in his employment may sell any drug he likes?

Mr. Guthrie: Yes. Of course it would ruin a man if he employed people not qualified for that work. It is expected that he will take care to note whether his assistant is competent to make up drugs and sell them. Of course you see the motive for a man to employ only people who are thoroughly competent, because in the event of anything going wrong his business is ruined.

Lord Justice-Clerk: Of course there is an immense deal in the arrangement of the premises so as to prevent mistakes.

Mr. Guthrie: Yes. Take oxalic acid for example——

Lord McLaren: I thought your case was that an unqualified man might be an assistant provided he was employed by a qualified man.

Mr. Guthrie: Yes. As I was saying, take oxalic acid—a person comes in and asks for so much oxalic acid. It is in a large jar labelled "oxalic acid," and all that has to be done by this person is to take out the requisite quantity, weigh it, and hand it over.

Lord McLaren: It may be very wrong to employ an unqualified person, but that is not the point—it is whether the Statute has imposed a penalty for so doing.

Mr. Guthrie: Now, the Statute was not designed to change the whole position of matters at once, but finding it necessary to deal with a state of matters in which anybody could start a druggist's shop and engage in a druggist's business, the Statute wanted to bring that to an end and to prevent people keeping open shop for the retailing, dispensing, and compounding of drugs unless they possessed a competent practical knowledge, and, as a way of finding out whether they had that, unless they belonged to the Pharmaceutical Society. It is really a question raised by the Society and not by the public at all. The Society does not like what exists in Scotland and not to any extent in England at all—that you have doctors who not only practice, but who make up in their shops their own drugs, and who sell to outsiders, not their own patients, drugs from their shop.

Lord McLaren: If a Statute prohibited any person from selling alcohol unless he had obtained a certificate from the proper authorities, would it be an offence against that Statute if an assistant should take the money and hand over the spirits without having a personal certificate?

Lord Rutherfurd-Clark: Are you classing alcohol amongst poisons?

Mr. Guthrie: It is not yet scheduled.

Lord McLaren: But there is an Act which makes it an offence to sell alcohol without having a certificate from a proper authority. Has it been held necessary in the interpretation of that Statute that every assistant should have a certificate?

Mr. Guthrie: Certainly not.

Lord McLaren: Is there really any great difference between the two cases?

Mr. Guthrie: I think all these analogies are entirely in my favour—that, probably, is entirely so—and you will recollect the question that came up as to the sale of salmon out of season. It was attempted to be made out that the assistant who made the sale was liable; but it was held by Lord Young, at Dumfries, in a case which is reported, that that was not so, because he was not the seller.

Lord Justice-Clerk: In that case if the assistant sells, the master is liable.

Mr. Guthrie: Yes.

Lord Rutherfurd-Clark: And in the same way with liquor?

Mr. Guthrie: Yes; and in the converse case, if you have a purchase of liquor by a child who is a mere messenger, there can be no conviction for selling to a child, because she is not buying for herself.

Lord Justice-Clerk: She is not buying at all.

Lord McLaren: You mean if the child comes as a messenger for the parent, that is not an offence.

Mr. Guthrie: No, though she is below 14, because it is not a sale to the child.

Lord Justice-Clerk: If the circumstances indicate it was a known thing, and that the liquor was just to be carried home.

Mr. Guthrie: The case I was thinking of was Graham *v.* Lang, 4 Rettie, Justiciary, 12; and the salmon case was Kerr *v.* Fynn, 30 Scottish Law Reporter, 607, March, 1893. If that was the purpose of the Statute, we think that the English decision to which I have referred has ignored that altogether, and has extended a Statute meant for the safety of the public to the prevention of any person, unless qualified, from having anything to do in the way of compounding or dispensing drugs if they contain poison, for I think it must come to that. The judgment which was come to recently ignores the preamble, and is founded on the words of sections 1 and 15, and on a clause in section 17, which I shall come to immediately. In sections 1 and 15 the expression is that it shall be unlawful for any person to sell or keep open shop for retailing or dispensing poisons, or to assume the title of chemist and druggist. No doubt you have a statement that it is unlawful to sell; but we submit that on the facts here this appellant did not sell, for the reasons your lordships have before you.

Lord Justice-Clerk: Because he had no conceivable right to the money.

Mr. Guthrie: None; the goods were not his and the money was not his.

**Lord Rutherfurd-Clark**: Is it quite certain he did not make the contract to sell? It was not a contract in which he was personally interested, but he sold to the buyer just as my agent sells for me, though not for himself.

**Mr. Guthrie**: In a sense that is so. I suppose that in the technical sense the party who sells is the principal.

**Lord Rutherfurd-Clark**: If the person who sells is the person interested in the traffic, but in any case the agent sells for his principal.

**Mr. Guthrie**: Is that not rather a popular sense than a technical?

**Lord Rutherfurd-Clark**: I don't think so. It is a very good description of the Act.

**Mr. Guthrie**: But if I want to know from whom I am buying?

**Lord Rutherfurd-Clark**: There is no question of that. You are buying from the principal.

**Mr. Guthrie**: Even in a popular sense, suppose you ask anyone, Where do you get your drugs? Whom do you get them from? you would not have any suggestion that the person who sold was the actual person who took the order and gave the drugs.

**Lord Rutherfurd-Clark**: The question is whether the Statute does not forbid any person to give the drugs on sale unless he is qualified.

**Mr. Guthrie**: If the preamble had been framed on the view of stopping all persons from compounding and dispensing drugs, it might be said that the word "sell" might be read in that sense, but if the object was to prevent people setting up shops——

**Lord McLaren**: You mean it in this way, that there are two persons concerned as the seller—there is the principal and there is the salesman—and that you satisfy the Statute if you show that the principal had a qualification.

**Mr. Guthrie**: No doubt.

**Lord McLaren**: Is the word "sell" associated with keeping open shop?

**Mr. Guthrie**: Yes, it is "sell or keep open shop." In England they seem to have thought—whether by some English rule or not I do not know—that these were necessarily different people.

**Lord Rutherfurd-Clark**: What is the English case?

**Mr. Guthrie**: The Pharmaceutical Society *v.* Wheeldon, 1890, 24 Queen's Bench Div., 683. That did not raise the question we have here of the specialty of a medical practitioner. It is an ordinary druggist. [Reads rubric.]

**Lord Rutherfurd-Clark**: That is about conclusive of this case.

**Mr. Guthrie**: Except the point of the medical practitioner. The judgment was delivered by Mr. Justice Hawkins, who goes over the sections, and while he refers to the preamble, I think he makes no comments upon it at all. [Refers to opinion.] The only other argument that had been presented was one founded upon section 17. The rubric is, "Regulations to be observed in the sale of poisons," and the section provides that the things in the first schedule shall not be given out unless the purchaser shall sign a book, and unless he is known in the shop, or somebody else who is known shall introduce him. Then the section says that "For the purposes of this section the person on whose behalf any sale is made by any apprentice or servant in the shop shall be deemed the seller." We found upon that section as showing that an apprentice is recognised as a person who is entitled to sell.

**Lord Rutherfurd-Clark**: Does that relate to poisons, or does it relate to general dispensing?

**Mr. Guthrie**: Regulations to be observed in the sale of poisons: the master is held to be the seller when a sale is made by an apprentice or servant. Servant, of course, is nothing, because he might be qualified or unqualified, but an apprentice cannot possibly be qualified, because no person can be a registered chemist who has not served as apprentice, and passed his examination and attained a certain age.

**Lord McLaren**: I am not sure you are right in throwing over servants. The offence is selling, and this section says that the master shall be held to be the seller where the sale is by an assistant. Now, the master here is qualified.

**Mr. Guthrie**: That is so. Of course in this particular case it is limited, because it says that for the purposes of this section the person on whose behalf any sale is made shall be held to be the seller.

**Lord Rutherfurd-Clark**: What are the purposes for which he shall be held to be the seller?

**Lord Justice-Clerk**: Entry in a book signed by the buyer.

**Lord Rutherfurd-Clark**: And with a penalty for non-observance?

**Mr. Guthrie**: Yes.

**Lord Rutherfurd-Clark**: So the master would be liable there for the act of his apprentice?

**Mr. Guthrie**: He would. Now one does not see how, if that is so, it can be held that you require to have, as maintained, a qualified chemist and druggist.

**Lord Rutherfurd-Clark**: He would be liable for the act of the apprentice, even though the apprentice is not qualified—that is, for the purposes of the section.

**Mr. Guthrie**: But it recognises the fact that you may have a sale made by an unqualified person.

**Lord Rutherfurd-Clark**: I thought you said it was for the purposes of that section.

**Mr. Guthrie**: Quite. My point is that it assumes you may have a sale by a person who cannot be a qualified chemist and druggist. But it is said against me, and is made a point in the English decision, that the section would seem to imply that if for the purposes of that section the seller shall be the trader, then for the rest of the Statute the seller may include the apprentice or servant; in short, that the word "seller" receives an interpretation, and that a seller, in the sense of the Statute, necessarily means a person who contracts on behalf of another. I do not see how that stipulation, which is a very necessary one to make, that the person on whose behalf any sale is made by any apprentice or servant, shall be deemed to be the seller for that particular purpose, necessarily implies he is not the seller in the rest of the Act. I submit there is nothing in the least inconsistent in tying him down to be the seller there, though he is also the seller in the rest of the Act, and making it quite distinct that the apprentice or servant, qualified or unqualified, shall not be himself alone responsible. My friend's whole argument is that if the servant is qualified, then he would be responsible. These are the whole sections that have been founded upon.

**Lord Rutherfurd-Clark**: What do the English judges say upon that section?

**Mr. Guthrie**: They simply say the language of section 17 fortifies them in the view they have taken, though in that section the legislature, where they intended that the person on whose behalf a sale is effected shall be deemed the seller, have said so in express words. Now that would seem to come to this, that the principal cannot be the seller.

**Lord Justice-Clerk**: Unless he sells for himself and leaves the boy to put on the label.

**Lord Rutherfurd-Clark**: It seems to come to this, that the legislature intended that no person was to receive a poisonous drug except from the hand of a duly qualified practitioner, and it is not a sufficient precaution—it is not a statutory precaution—that it is to be accepted that a duly qualified practitioner will employ a duly qualified but not a registered man.

**Mr. Guthrie**: Yes; now, if you have an ambiguous expression——

**Lord Justice-Clerk**: Under clause 17, if an apprentice or servant sells a box containing poison without putting a label on it, he would be liable to be prosecuted for selling, and his master would be prosecuted because he allowed the servant to sell without putting the label on.

Lord Rutherfurd-Clark: Yes, and I do not think there is any consistency in it.

Lord Justice-Clerk: One would think if the master was to be punished for a label not being put on, he might be equally punished for permitting the sale.

Mr. Guthrie: In this section, apparently, the person who would be liable in the penalty is the master.

Lord Rutherfurd-Clark: Suppose the shop is opened by a properly qualified practitioner, and he is not near it for a twelvemonth, would the Act not apply to him?

Mr. Guthrie: No, if the shop is his.

Lord Rutherfurd-Clark: So all it means is that the person having an interest in the business must be a qualified practitioner, but he may carry on the entire business for years, and yet not have a qualified man in it?

Mr. Guthrie: Yes, because he is the man who keeps the shop open.

Lord Rutherfurd-Clark: It may be so, but if the law says that, it is not making much protection.

Mr. Guthrie; I should think if you have a person who is responsible for his men, and who is a member of the Society, you have a very great security.

Lord Rutherfurd-Clark: Yes, but he may have several shops in several parts of the kingdom.

Mr. Guthrie: He might, and just as in the case of businesses of other kinds, it is his interest to see that they are properly conducted.

Lord Rutherfurd-Clark: We don't know what his interest would be.

Mr. Guthrie: His interest would be the same as that of the public, because he would lose his certificate if anything went wrong.

Lord Rutherfurd-Clark: The interest of the chemist is not always the interest of the public.

Mr. Guthrie: In the way of cost it is not.

Lord Rutherfurd-Clark: I don't mean that, but Sir Walter Scott once found a man practising on the English border where he sold "calomy" and "laudamy," and justified it on the ground that it would take a long time to make up for Flodden.

Mr. Guthrie: Suppose a man was to employ people who were unacceptable, the Society would be down on him.

Lord Rutherfurd-Clark: But the question is whether the Statute did not mean that the articles should be delivered to the customer by a properly qualified practitioner.

Mr. Guthrie: The Statute might have said so quite distinctly. The Statute has used the word "selling," which *primâ facie* refers to the person who owns the goods and who gets the money. The Statute, so far as it gives any other assistance, does so in the preamble, which limits itself to this, that it is not right that persons should keep open shop who are unqualified, and for whom there is no guarantee at all. I think the Statute, when it uses the words "sell or keep open shop," adds that expression "or keep open shop" after the word "sell" for several reasons. Your lordship sees "keep open shop" would refer to retail traffic and not to wholesale. Then, further, a man might have said, "You cannot go against me. No doubt I keep open shop, and have the sign up of pharmaceutical chemist, but you have failed to prove any actual sale." The Statute says that will not do; it is enough if it is proved you keep an open shop, and in all cases it is the same man who is intended, namely, the trader, and not the actual person who serves behind the counter. That is really the groundwork of the judgment, with this addition, that Mr. Justice Hawkins thought he was strongly fortified in his view by the judgment of the House of Lords in the case of the Pharmaceutical Society *v.* The London and Provincial Supply Association, 5 Appeal Cases, 857. He adds: "It is true the question in that case was different from that raised in the present, but the views entertained and expressed, particularly in the opinion of Lord Selborne, directly bear upon the question at issue." In that case the question related to a corporation, and the question was whether a corporation could be found liable to the penalty for keeping open shop. The position of matters was that one member of the corporation was a qualified chemist, but the corporation itself was not qualified, for the very good reason that it could not serve an apprenticeship, nor pass an examination, nor under the Act be registered as a member of the Society, and the court there had to consider what does the word "person" mean in the Statute? They thought the word "person" was capable of including a corporation and was capable of excluding a corporation. As Lord Blackburn said, popularly he thought it did not include a corporation, technically he thought it did, and looking to the object of the Statute they came to the conclusion that in that case "person" did not include corporation, the ground of judgment being that a corporation could not possibly conform to the Act, because it could not be registered.

Lord Rutherfurd-Clark: Then a corporation may sell any amount of drugs?

Mr. Guthrie: They can and they do.

Lord Rutherfurd-Clark: Without having any qualification?

Mr. Guthrie: Yes; there is the Drug Supply Association in Edinburgh, and there are many big ones in England. Of course the question still remains over in Scotland whether they require to sell through qualified assistants, and they have the same interest probably.

Lord Rutherfurd-Clark: That means that I individually cannot keep an open shop, even though I had qualified assistants?

Mr. Guthrie: That is so.

Lord Rutherfurd-Clark: A corporation can: but a corporation cannot sell without qualified assistants.

Mr. Guthrie: We maintain it can.

Lord Rutherfurd-Clark: You mean that if a corporation keeps a drug shop the Act provides no protection for the safety of the public?

Mr. Guthrie: If that judgment is sound, it would follow, I think, that a corporation would not be struck at by the Act as a person, and in our view the assistant would not be struck at, because he is not the seller.

Lord Rutherfurd-Clark: Then your view necessarily brings it to this, that a corporation may carry on this business without having qualified assistants, whereas the view of the English court would be that if there is to be a corporation, the corporation must employ qualified men?

Mr. Guthrie: Yes, I think the two views include the two cases.

Lord Rutherfurd-Clark: You are therefore taking the Statute on this footing, that it provides no protection for the safety of the public if the owner of the drug shop be a corporation.

Mr. Guthrie: I think it is not wonderful, because at that time such things were quite unknown.

Lord Rutherfurd-Clark: When?

Mr. Guthrie: In 1868.

Lord Rutherfurd-Clark: But every limited liability company is a corporation.

Mr. Guthrie: No doubt, but if one looks at the lists one finds that corporations who sell drugs are very few even now, and of very recent institution. The Statute took the thing as it was—that is to say, individuals or firms carrying on business as chemists and druggists throughout the country.

Lord Rutherfurd-Clark: One would not willingly take that construction if it meant that any man could set up a case that he was to get free of these Statutes.

Mr. Guthrie: It may be the Statute has used a word "person," which in this particular case does not include corporations.

Lord Rutherfurd-Clark: I assume that, but in that case you must have a qualified seller.

Mr. Guthrie: That is what I maintain is optional, and I think the Statute leaves it in that position. The legislature has not so defined the persons who are to have the shop as to include corporations—that is to say, if the judgment arrived at in the case I have referred to is sound. These were the grounds in the English decision, and, I think, the only grounds, and we submit that the judgment arrived at in England by those two judges, which at that time, as I am informed, was quite contrary to the whole practice of the country, is not sound. There have been, I am told, some prosecutions about that time and since that time, none of which, until this case, have been appealed. In this particular case there were six or eight prosecutions, and it was thought desirable to take a perfectly pure case without any specialties, and that is why the present case is taken.

Lord McLaren: Is there no general enactment to the effect that, where not excluded by the context, the word "person" shall include a body politic or corporation? One often sees such a provision in definition clauses of individual Acts.

Mr. Guthrie: They have dealt with that in this particular case.

Lord Rutherfurd-Clark: And that would not do, because a corporation can never be a qualified practitioner.

Lord McLaren: Then it would come to this, that a corporation cannot sell drugs.

Mr. Guthrie: Yes.

Lord Rutherfurd-Clark: And therefore they held that when a corporation was the employer, the assistant was the seller in the transaction.

Mr. Guthrie: With deference, I don't think that follows. Undoubtedly in the case dealt with by that judgment it was contended that, if the corporation was not a person, the Act would not apply at all. Still, in the end, what the judgment did say was, as Justice Hawkins said, that a person did not include corporations.

Lord Rutherfurd-Clark: Did they not express an opinion as to who was the person a corporation must employ if it kept a shop?

Mr. Guthrie: Yes. I think Lord Selborne's view was that the assistant would be liable, but there was nobody there to argue the case on behalf of the assistant.

Lord Rutherfurd-Clark: That was hard upon the assistant certainly. It would have made it desirable to raise the plea "all parties not called."

Mr. Guthrie: It is now proposed on this English decision to overturn the practice and the understanding really of everybody, because it is the fact that Bills have been promoted over and over again by this very Society to compel all assistants selling drugs, even on behalf of others, to be qualified, and the present proposal is one quite contrary to the understanding everybody had as to the meaning of the Statute, and, we say, goes entirely beyond the intention of the Statute, as shown by the preamble.

Lord McLaren: But the decision was pronounced four years ago.

Mr. Guthrie: Three years ago. Now there is a separate point which arises from the fact that Dr. Kelly is a qualified and registered medical practitioner, and that arises on the terms of section 16 of the 1868 Act, and a section of the Act of 1869, 32 and 33 Vict. c. 117, entitled "An Act to Amend the Pharmacy Act of 1868." In that Act the first clause is to the effect that nothing contained in the first fifteen sections of the recited Act shall affect any person who has been registered as a legally qualified medical practitioner before the passing of this Act, and the said clauses shall not apply to any person who may hereafter be registered as a legally qualified practitioner, and so on. One requires to look at that in connection with section 16 of the 1868 Act, which reserves rights to certain persons. It says "Nothing herein contained shall extend to or interfere with the business of any legally qualified apothecary or any member of the Royal College of Veterinary Surgeons." The first Statute was passed apparently in considerable ignorance of the state of matters in Scotland. In England the only doctors who can both prescribe and also compound medicines are apothecaries, but in Scotland we have always had a large number of medical practitioners who have had the necessary qualification, and who have been in the habit of not only prescribing but of compounding and dispensing drugs.

Lord Rutherfurd-Clark: A doctor who has got his degree is not prevented from dispensing.

Mr. Guthrie: In 1868 there had been a restriction, but after 1869, if a man has passed an examination in pharmacy he is entitled to dispense—a medical doctor apparently of any kind. He can dispense drugs if he has passed an examination in pharmacy.

Lord Rutherfurd-Clark: What is the specialty here?

Mr. Guthrie: That Dr. Kelly is a legally qualified practitioner, and that the Act exempts him from the provisions of the first fifteen sections of the Act of 1868. He is not an ordinary druggist who is under the first fifteen sections.

Lord Rutherfurd-Clark: How will that exempt the assistant?

Mr. Guthrie: Because we submit that he, or persons who are employed by him, are exempted.

Lord Rutherfurd-Clark: So is the corporation.

Mr. Guthrie: But the corporation has nothing to do with the Act at all.

Lord Rutherfurd Clark: Neither has Dr. Kelly according to your view.

Mr. Guthrie: I submit that the corporation being outside the Act is exempted.

Lord Rutherfurd-Clark: But that goes against the view expressed by Lord Selborne, that a corporation who sets up a drug shop must have a properly qualified man.

Mr. Guthrie: But Dr. Kelly has a special provision in his favour.

Lord Rutherfurd-Clark: Which does no more than cover him?

Mr. Guthrie: Yes, because you have to take the two together. In the 1868 Act you have "Nothing herein contained shall extend to or interfere with the business of any legally qualified apothecary," etc. Now, by the 1869 Act the medical practitioner is put in the same position as the apothecary (sec. 1). Interfering with the business, I think, means with them in their conduct of the business. It is not to extend to them individually, and it is not to interfere with their business. They apparently remembered you had doctors with shops, and I submit what they meant was to put these into the position of the English apothecaries, who had been exempt from the provisions of the 1868 Act.

Lord Justice-Clerk: You maintain that if a person is dispensing who is a medical practitioner, the Act of 1868 does not apply?

Mr. Guthrie: The first fifteen sections do not apply?

Lord Rutherfurd-Clark: And therefore when you sell in his shop, by his authority, you cannot possibly commit an offence against the Act?

Mr. Guthrie: I think so, and I think it is quite natural, because when you have an apothecary in England or a practitioner in Scotland you have a guarantee for the proper conduct of the business. I think the man is in the position of a medical practitioner, who has not only the motive, but the qualifications, for knowing who will be a suitable assistant, and who will see that his premises are kept in such a condition as will make it perfectly easy for his assistant to hand out the proper drugs at the proper time. If it does not mean that, one has a difficulty in seeing why it should have done more than say that these sections should not extend to him. But it says—"shall not interfere with his business."

Lord Justice-Clerk: I suppose it means—extend to the business or interfere with the business.

Mr. Guthrie: Yes; their business is to be unaffected, and, if so, this business of Dr. Kelly is proposed to be put in that position.

Lord Rutherfurd-Clark: In England is it held that an assistant in an apothecary's may sell without committing an offence?

Mr. Guthrie: So far as appears in the books they have never been prosecuted.

Lord Rutherfurd-Clark: Who was the employer in the case you cited?

Mr. Guthrie: An ordinary pharmaceutical chemist, who had no special qualification; so the point does not seem to have arisen there. We say therefore that the first question should be answered in the negative.

Lord Justice-Clerk: What you mean is that a medical practitioner who has been properly trained in medicine is a man who can be safely trusted to conduct his business with safety to the public.

Mr. Guthrie: That is so.

Their lordships consulted for a few minutes.

Thereafter,

Lord Justice-Clerk: What have you to say, Mr. Morison, about the medical practitioner?

Mr. Morison: I was going to deal with that second point first. I think my friend did not refer to the section of the Act which deals with the medical practitioner. The section he did refer to dealt only with apothecaries and members of the Royal College of Veterinary Surgeons. The section which deals with medical practitioners is section 1 of the Act of 1869. "Nothing contained in the first fifteen sections of the recited Act shall affect any person who has been registered as a legally qualified medical practitioner, and who, in order to obtain his diploma for such registration, shall have passed an examination in pharmacy, etc." That is the only section in any Pharmacy Act which deals with the position of the medical practitioner, and all that this section provides is that it shall not apply to the person who holds such a medical certificate.

Lord Justice-Clerk: Is there anything about his business?

Mr. Morison: No, not a word about his business. All it says is that a medical practitioner is to have personal exemption from the first fifteen clauses of the Statute.

Lord Justice-Clerk: Being qualified in pharmacy.

Lord Rutherfurd-Clark: Then he can open a shop, and they don't apply to him at all?

Mr. Morison: No, he himself can sell.

Lord Rutherfurd-Clark: Of course. Could he not have sold before?

Mr. Morison: Not before this Act.

Lord Rutherfurd-Clark: Could he not?

Mr. Guthrie: Anybody could sell.

Lord Rutherfurd-Clark: But would anybody sell without incurring penalties?

Mr. Morison: Between 1868 and 1869 a medical practitioner would have incurred penalties.

Lord Rutherfurd-Clark: If he was not a qualified druggist?

Mr. Morison: Yes, and that Act was passed for the purpose.

Lord Rutherfurd-Clark: So that he might be treated as a qualified druggist to keep open shop, leaving the question of assistant the same as before.

Lord McLaren: It seems to be the same question under the Act of 1869 as the question already argued under the Act of 1868. The 16th section of the 1868 Act does not refer to medical practitioners at all.

Lord Rutherfurd-Clark: Are they able to keep open shop and supply poisons without committing any offence?

Mr. Morison: No; they must have registered assistants, and they have been prosecuted in England.

Lord Justice-Clerk: But are they themselves entitled to dispense?

Mr. Morison: Certainly.

Lord McLaren: Are they not bound to enter in a register the poisons which they sell?

Mr. Morison: Yes, under the 17th section.

Lord Rutherfurd-Clark: How many clauses does section 1 of the Act of 1869 exempt them from?

Mr. Morison: Sections 1 to 15.

Lord Justice-Clerk: And it applies to the selling or keeping open shop?

Mr. Morison: Yes.

Lord Rutherfurd-Clark: And therefore a man who has no qualification as druggist may keep a shop?

Mr. Morison: If he is an English apothecary, or a medical practitioner, or a member of the College of Veterinary Surgeons.

Lord Rutherfurd-Clark: Does not the last Act make a medical practitioner equal to an apothecary?

Mr. Morison: The words are different in the two sections. There is nothing about business as applied to the medical practitioner in the 1869 Act, and it is the 16th section of the 1868 Act which refers to the business of a legally qualified apothecary.

Lord Justice-Clerk: But does the Act of 1869 say that sections 1 to 15 shall not apply to a medical practitioner?

Mr. Morison: That is so.

Lord Rutherfurd-Clark: Then he may keep a shop, but that still leaves the question whether his assistant can sell, which is raised by the English case, and that would make it precisely the same as if a corporation had a shop, and the question is the same as whether a corporation can sell by unregistered assistants.

Mr. Morison: Yes, it is the same point.

Lord Justice-Clerk: That raises, practically, the question decided in England. Suppose our view came to be different from that of the English judges—I do not say it will—it would be improper for us to decide the matter without a fuller hearing before a full bench of judges.

Lord Rutherfurd-Clark: You are going to contend, Mr. Guthrie, for a reversal of the English decision?

Mr. Guthrie: Yes, I quite admit the English decision is in point, except on the medical practitioner.

Lord Rutherfurd-Clark: I don't think that can carry you through, unless you maintain that a doctor's assistant who has no qualification may sell poisons.

The case was then adjourned.

### Proceedings under the Pharmacy Acts at Exeter.

At the Exeter County Court on Tuesday, before his Honour Judge Edge, the case of the Council of the Pharmaceutical Society of Great Britain *v.* C. Hornsey, 117A, Cowick Street, St. Thomas, Exeter, watchmaker, was heard.

Mr. T. R. Grey, barrister-at-law (instructed by Messrs. Flux, Son and Co., London), appeared for the plaintiffs, and Mr. A. E. Dunn, solicitor (Exeter), for the defendant. The claim was for two penalties of £5 each, incurred by the defendant on December 23, 1893, and on January 5, 1894, respectively, in keeping open shop for the retailing, dispensing or compounding of poison, to wit, "corrosive sublimate," a poison in the schedule of the Pharmacy Act, 1868, contained in and forming part of the ingredients in a compound called "Hornsey's Devonshire Specific," contrary to the provisions of the said Statute (31 and 32 Vic., cap. 121).

Mr. Grey detailed particulars of claim, and stated that the defendant, a watchmaker, was a maker and vendor of a certain substance called "Hornsey's Devonshire Specific," which he says would cure various diseases, and persons bitten by animals affected with rabies. His Honour would see that the bottles were not labelled "poison," and that there were no directions of the amount to be used. Two bottles of the lotion were purchased at the defendant's shop, and were found to contain a very large quantity of a most deadly poison called corrosive sublimate. In one, an 8-oz. bottle, there were no less than 50 grains of the poison, whilst in the second one there were 43 grains. A fatal dose was as small as 3 grains. It was thus a very poisonous substance, and when there were no instructions as to whether it should be taken internally or not, it showed the public the danger of its being sold by the defendant, who was not a registered chemist, and had passed no examinations with regard to poisons mentioned in the Act. Mr. Grey then referred to the sections of the Act applicable to the case, and proceeding to deal with the facts, stated that the only directions there were were on a label attached to the bottle. The label read as follows:—"Hornsey's Devonshire Specific for the cure of asthma, bronchitis, diphtheria, consumption, gout, rheumatism, sciatica, lumbago, white swelling, diseased bones, corns, warts, bunions, etc. Persons bitten by rabies will find it a certain preventative of hydrophobia. Bathe the wound for a few minutes in warm water; wipe dry; saturate a bit of linen rag with the lotion; continue to apply until all poison is abstracted." But, continued Mr. Grey, that did not help in any way to guide the purchaser. Even if a chemist sold the substance he had to follow the regulations of the Act contained in section 17. Not only had he to know the purchaser, but he also had to register the sale—the name of the article, and the purpose for which it was wanted, and those entries were to be attested by the purchaser's signature. This was done for the purpose of tracing cases of suicide or murder.

Sergt. Crook, of the Devon constabulary, stationed at Exeter, deposed that on December 23 last he went to 117A, Cowick Street, and purchased a bottle of "Hornsey's Devonshire Specific." He paid 1s. for it. On January 5 last he went to the same shop again and purchased another bottle. He handed the bottles to Mr. Moon. The defendant served him on the second occasion. In cross-examination the witness stated that there were no bottles in the shop window, and the two he purchased were taken from a cupboard under the counter.

Mr. Harry Moon, clerk in the office of the Registrar of the Pharmaceutical Society, proved receiving the two bottles (produced) from the last witness, and handing them to the analyst.

Mr. E. J. Eastes, analyst and Fellow of the Institute of Chemistry, stated that the two bottles in question were handed to him by the last witness. He carefully analysed the contents, and found in one of the bottles 50 grains of corrosive sublimate. It was an 8-oz. bottle, and there were 6¼ grains to 1 fluid ounce. The other bottle was a 6-oz. bottle, and there were 43 grains of corrosive sublimate, 7¼ grains to 1 fluid ounce. There was enough poison in the two bottles to kill twenty or thirty people.

Mr. Frank Wilfred Stokes, clerk to Mr. E. S. Lisle, assistant-overseer for St. Thomas, gave evidence as to the defendant being the tenant of the shop in question.

Mr. Dunn, in defence, said he did not wish to criticise the action of the Society in any way, but he could not help thinking that, in a case of this kind, where they were dealing with an old man who had for the last fifty years been making this medicine and letting his neighbours have it, it might, perhaps, have been more kind if they had given him a warning before taking the somewhat extreme course of commencing these proceedings. The first intimation his client had of any such proceedings was a letter he received on January 10 last from the solicitors in the present action. It was a letter demanding the sum of £10 5s., and saying that unless it was paid, proceedings would be taken for the recovery thereof. No warning of any kind was given to tell the old man he had done that which was an infringement of the law. Of course, the Society was formed for the protection of the public, but he could not help thinking that in a case of this kind it would have been sufficient to have told him that he was doing wrong, and to have got from him an undertaking that he would not infringe the law in future. He was afraid his client had committed an offence and subjected himself to penalties, but he submitted respectfully to his Honour that the claim that had been made was not a claim for an offence defendant had committed. Under the 15th section of the Act there would appear to be two offences, one for selling and the other for keeping an open shop. The Society did not claim from the defendant for selling; the claim was for keeping an open shop. He submitted that the case had not been made out, or at any rate, having heard the defendant, he would ask the judge to say he had not committed the offence of keeping an open shop for retailing or dispensing a compound of poison. In this case he contended his client had not kept an open shop for that purpose. Although he did sell a bottle of medicine at the shop, it was not conclusive that he kept an open shop for the purpose of retailing, etc. The purpose for which his shop was kept—that of carrying on a watch and clock making business—must be borne in mind. For many years past defendant had been making this lotion, which was a dangerous practice, and a practice it would be very unwise to continue on his part, but the shop was not used for the purpose of retailing this medicine.

The defendant was called, and stated that he was 67 years of age, and had been in the habit of making the lotion for about fifty years. It was an old family "relic." No complaint had been made to him that it was a wrong thing for him to do. He kept the shop open for the purpose of doing a watch and clock cleaning business, and not for the purpose of selling his medicine. He kept a bottle or two there in case any inquiries were made for it. Sergeant Crook stated to him that he had been recommended to him. He had never refused to give a poor creature a bottle who could not afford to pay for it. He always explained how it must be used. After Sergeant Crook obtained the second bottle he made off as fast as he could without receiving the instructions.

In cross-examination by Mr. Grey, the defendant said he knew corrosive sublimate was a very deadly poison, and that the amount sold in one of the bottles was enough to kill eight or nine people, that was, if taken inwardly, but it was an outward application. He went to the shop in May, 1893. In making the lotion he mixed 24 ounces at a time in a bottle. He did not make all his lotion with corrosive sublimate in it. He made a lotion without putting in any poison.

His Honour: For the same purposes.

Defendant: For the same purposes, with the exception of hydrophobia.

His Honour (looking at the label): Anyone might suppose people had to drink this particular lotion for asthma, etc.

Replying to the judge, the defendant stated that the name of "Stanfield, watch and clock maker," a former tenant, was over the door of his shop, and he had no notice in his window relating to the lotion. He did not advertise the lotion in any way.

A long argument took place between his Honour and the learned counsel as to whether the defendant strictly came within the Statute. His Honour observed that if persons could go into the shop, which was kept open for the purpose of selling this lotion, then it would be an offence, but he questioned if the defendant came within the law in this case, because he did not advertise the lotion for sale, and there was nothing in his window inviting the public to purchase it. Mr. Grey said that not only did the defendant keep an open shop for the sale of poison, but he made it himself. If the person sold the lotion —and he had proved that he did sell it—it did not matter how many other things he had in his shop. He submitted as a point of law that, if he proved before his Honour—as he had proved that day—that two bottles were sold on different occasions from the shop to a man who was not known there, and were paid for, the person who was the owner of the shop was keeping an open shop for the purpose of selling this poison, whether he advertised it for sale or not. If his Honour held against him, he would still have to rule that however many bottles defendant sold, it could not be altered, because defendant kept them away in a cupboard, and no advertisement was published inviting the public to buy. Mr. Grey quoted the following in support of his case:—Pharmaceutical Society *v.* Piper and Co., 1893, 1 Q. B., 686; Pharmaceutical Society *v.* London and Provincial Supply Association, which went to the House of Lords, and quoted in 5 Appeal Cases, 1857, and Pharmaceutical Society *v.* Wheeldon, 24 Q. B. D., 683.

His Honour said he would reserve his judgment in this case in order to consider the points of law raised. He thought it was a very dangerous thing that anyone should be allowed to sell a lotion containing such a deadly poison as corrosive sublimate. At the same time this was an action for a penalty, and he must see that the defendant was brought strictly within the Statute. He was not sued in this case for having sold the poison, but he was sued for having kept an open shop for the retailing of the lotion, and the question to his mind was whether, as a point of fact, he really did keep an open shop within the meaning of the Statute. It seemed to him that the legislature in imposing a penalty meant it to be imposed upon a person who sold, and kept an open shop which the public could enter, and in which they were invited to enter, for the retailing of the poison. He thought it was very doubtful indeed whether the defendant in this case did keep an open shop for the purpose. All that he seemed to have done was to keep these poisons in a back place or an inner room in the shop. He did not advertise them, but used his shop for another purpose entirely, namely, the carrying on of a watch-making business, and that, no doubt, was a *bonâ fide* business. The great question, therefore, arose as to whether the defendant was brought within the Statute. It might be that he was wrong in his present opinion. This was a matter of considerable public importance, and he quite agreed with everything that had been said as to the desirability of putting a stop to this practice of selling poisons in private shops or places, but if his decision was against the plaintiffs, it did not prohibit them whenever they found a person selling anything of the kind from taking proceedings against him for so doing.

Mr. Dunn said he could assure the plaintiffs that no lotion would be made in future by the defendant.

In answer to Mr. Grey, his Honour said that, should his decision be against the plaintiffs, he would give them leave to appeal.

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### PROCEEDINGS UNDER THE PHARMACY ACTS AT DERBY.

At the Derby County Court on Tuesday, his Honour Judge Kenelm Digby gave judgment in an action brought by the Pharmaceutical Society against W. Armson, a grocer, of Melbourne, to recover a penalty alleged to have been incurred by him for keeping open shop, contrary to the provisions of the Statute, for the retailing, dispensing, or compounding of poisons, to wit, "morphine," or a preparation of morphine, being a poison within the meaning of the Pharmacy Act, 1868, and forming part of the ingredients of a compound called Powell's balsam of aniseed. His Honour in his judgment said that it was proved at the trial that the defendant, who was a grocer at Melbourne and not a registered chemist, did on October 1, 1892, sell a bottle of the compound mentioned. The contest at the trial was whether this compound was a "poison" within the meaning of the Act. The bottle sold contained nearly an ounce of liquid, and a label was affixed on which was printed "directions for use," prescribing as the proper dose for an adult a teaspoonful; for a child of four years sixteen drops; eight years, twenty drops; and twelve years, forty drops. Upon analysis the contents of the bottle were found to consist, amongst other ingredients, of one-tenth of a grain of morphine, which is the chief medicinal principle of opium, and is in its pure state a dangerous poison. It was not disputed that morphine was a poison within the meaning of the Pharmacy Act, 1868. The preamble of the Pharmacy Act states as the object of the Act that it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, and compounding of poisons should possess a competent knowledge of the business. The scheme of the Act was to prohibit persons, whose knowledge was not subject to the tests therein provided, from dealing in poisons at all, and even registered chemists are placed under certain obligations with regard to the sale of poisons. The first section forbids every person not duly qualified to sell or keep open shop for retailing, dispensing or compounding poisons. There is no definition of the word "poison" in the Act, but the second section provides that the several articles named in the schedule "A" shall be deemed to be poisons within the meaning of the Act. The schedule contains amongst the list of poisons "opium and its preparations;" the section also provides a mode by which the Council of the Pharmaceutical Society, with the approval of the Privy Council, may from time to time add to the list. The fifteenth section imposes the penalty of £5 for every offence following, so far as is rational in this case, the language of the first section in describing the offence. The plaintiffs contended in the first place that the penalty imposed by the Pharmacy Act, 1868, was incurred by the defendant on the ground that it was proved that the compound sold contained an appreciable quantity of a scheduled poison, and that this fact taken alone was enough to bring the thing sold within the description of a scheduled poison as being opium or morphine, or a preparation of opium or morphine. The plaintiffs, however, did not rest their case there, but in the second place gave evidence of the possible or probable injurious effects which might be caused to children, and even to adults, by the morphine contained in the compound, and they contended that, even if the mere presence in the compound of a small quantity of morphine was not enough to make the sale of the compound an offence within the Statute, its deleterious character was sufficiently established to give the whole compound the character of a poison within the meaning of the Statute. The first question then is whether the Statute is influenced by the mere fact that the compound sold contains an appreciable quantity of a scheduled poison. Before the case of the Pharmaceutical Society *v.* Piper (1893, 1 Q. B., 686) it was contended in opposition to a claim for a penalty under this Act that the prohibition extended only to the sale of the poisons mentioned in the schedule (with the additions made from time to time as above mentioned); and consequently that unless the thing sold came under the description of one of these specified poisons, no penalty would be incurred, however dangerous or even fatal the thing sold might be. With regard to the words, "Opium and its preparations," it was urged that the mere fact of a compound containing opium was not enough to bring it within the description of the schedule unless the whole compound could be properly styled a poison, and that if it had been the intention of the legislature to prohibit the sale of a compound which contained opium as one of its ingredients, it would have been easy to have added words to that effect, but no such provision could be implied from the language of the Act. The judges, however, who decided the case above referred to, while admitting the force of these arguments, held that the Act must receive a wider interpretation, and that it prohibited the sale of a compound which contained a scheduled poison—at any rate, if that compound contained a sufficient quantity of a scheduled poison to kill an adult if the whole were taken at once. The compound in question in that case was "chlorodyne," which it was stated in the judgment of Mr. Justice Collins could not be described either as opium or a preparation of opium, but yet was held to be a poison within the meaning of the Act. A careful examination of the judgment shows, I think, that in Mr. Justice Lawrance's opinion the mere fact that the compound contained a scheduled poison was enough. Mr. Justice Collins, on the other hand, appears not to have based his judgment upon this point alone. He carefully leaves open the question whether the Statute would apply to the case of a compound containing an infinitesimally small quantity of a scheduled poison. He confined his judgment to the particular case of "chlorodyne," which was, "in its entirety, a poisonous thing, that is, a small quantity might kill the person taking it." It appears to me, therefore, that this case does not decide in the plaintiffs' favour the proposition, for which they contend, that it is sufficient to show that the compound contained as an ingredient a scheduled poison, irrespective of the character of the composition as a whole. On the other hand, it precludes the defendant from successfully contending (at any rate in this court) that a compound which as a whole does not fall within any of the descriptions in the schedule is therefore not within the Act, if, on the other hand, it is shown to contain a scheduled poison and to be "in its entirety a poisonous thing." This view of the effect of the decision in the Pharmaceutical Society *v.* Piper is, I think, confirmed by the later case of the Pharmaceutical Society *v.* Delve (1894, 1 Q. B., 71). In that case the compound called "licoricine" was found to contain a small quantity of morphine. The analyst did not take the quantity, but said it might be one-fiftieth of a grain per ounce. The county court judge held that the evidence as to quantity did not justify him in holding the compound to be a poison. This judgment was upheld in the Divisional Court. The judgment proceeded on the ground that though it was found that the medicine contained a small quantity of morphine, yet in the absence of evidence as to quantity, the judge was right in holding that a penalty had not been incurred. This case appears to decide the point which was left open in Piper's case, that the mere fact that the compound contains a scheduled poison is not by itself enough to make it a poison within the meaning of the Act. The result, therefore, of the authorities seems to be that the question which the court has to decide is not simply whether the compound contains a scheduled poison, but whether it contains a scheduled poison in sufficient quantity to make the thing sold a poison within the meaning of the Act. This brings me to the consideration of the second point contended by the plaintiffs, and really makes the case turn on a question of fact. Having regard to the importance of the case and to the probability of an appeal, it was right to state as clearly as possible the matter which, in my opinion, ought to be taken into consideration in determining the question of fact. In Piper's case, taking Mr. Justice Collins' judgment as indicating the true *ratio decedendi*, it was held that the chlorodyne was a poison within the meaning of the Act, because it contained a scheduled poison, and because a small quantity of the compound might kill an adult. Mr. Justice Collins says, "The question whether or not there is more or less of a scheduled poison in the compound is not one which has any logical bearing on the question until we arrive at the principle *de minimus non curat lex.*" But it remains an open question at what point that principle is reached. It was not arrived at in Piper's case, because it was held to be the fact that the compound might be fatal to an adult. It was arrived at in Delve's case because there was no evidence as to the quantity or effects of the poison contained in the compound. In the present case there is evidence as to the quantity of the scheduled poison, and there is also evidence as to its effects, probable and possible, upon adults, children, and infants. It seems that, adopting the language of Mr. Justice Collins, the question which I have to ask myself is, "Is the thing sold in its entirety a poisonous thing?" The word "poison," according to Johnson's 'Dictionary,' means that which destroys or injures life by a small quantity, and by means not obvious to the senses. In Piper's case it was held that the compound was a poison, because the whole if taken at once might be fatal to an adult human life. If the type of life to which the compound must be fatal or dangerous in order to have the character of a poison be that of an adult, I should hesitate upon the evidence in the present case to find that the compound could properly be described as a poison. It was said, indeed, that it might be fatal to an adult suffering from certain diseases, but except under those special conditions I do not think that the evidence established that the contents of the bottle if taken at once would ordinarily be fatal or even injurious to adult life. In the case of children, however, it was stated in the evidence given on behalf of the plaintiff, that if the whole contents of the bottle were taken at once by a child in ordinary health, it would certainly be injurious and might be fatal, and to an infant probably fatal. This evidence was not contradicted or seriously impugned by the witnesses called for the defence, and in my opinion I ought to accept it as true. That the medicine was intended for children as well as adults is apparent from the "directions for use" affixed to the bottle, and it seems to me that a compound which might have the effect stated upon the life of a child may properly be described as a poisonous thing, although it may be comparatively innocuous to an adult in ordinary health. At any rate it appears to me impossible if I apply, as I am bound to do, the rule of the decision in Piper's case, to say that the defendant's act in selling the bottle containing a scheduled poison is protected by the principle *de minimus non curat lex*. I am, therefore, of opinion that the selling of the bottle in question was an offence within the Act, and that the plaintiffs are entitled to recover the penalty of £5. There will be leave to appeal, and if notice of appeal be given within fourteen days, there will be stay of execution pending appeal.

## POISONING BY STRYCHNINE.

At an inquest held at the Bath Guildhall, on March 1, upon the body of Blanche Smith, aged four, the daughter of Brooke Smith, a masseur, it appeared that the stomach, which had been analysed, contained traces of strychnine and a whole nux vomica pill. It was supposed that the child swallowed some of the pills, which had been placed in a drawer in a bedroom by her mother. The jury found a verdict of "Death from poisoning."—*Bristol Times.*

## POISONING BY LAUDANUM.

Mr. R. Taylor, borough coroner, held an inquest on Tuesday, March 6, at the Ninehouse Tavern, Great Lever, relative to the death, through poisoning, of a man named William Lever, thirty-three years of age, butcher, of Brick Street.

Evidence was tendered by deceased's wife as to his sleeplessness, and to his retiring to bed on Friday night. On Saturday morning, about 5.30, he called his daughter to go to work, and witness at that time went into his room to see how he was. He snored so heavily that she became suspicious, and Dr. Patchett was called in, but despite his utmost attention, Lever expired.

William Robinson, of 15, Back York Street, was then sworn. He saw deceased in the Farmer's Arms on Friday evening, and at Lever's request witness purchased three twopenny bottles of laudanum at various shops, the attendant at Pare's asking him what it was for. Witness told him "it would be all right; there would be no trouble about it." Deceased remarked to Robinson that he had a cough and was troubled with want of sleep, and they parted in the public-house at nine o'clock, Lever going home.

Dr. Patchett was next called, and his testimony was that the three bottles produced by Detective Howcroft (they being found under deceased's pillow on Saturday morning) would each contain sufficient laudanum to kill a man, especially a man with a weak heart. He had attended deceased for eight or ten years at intervals, and on Saturday went to see him. Lever was then in a comatose state, and died in a short time from opium poisoning.

The coroner, in summing up, strongly condemned the present condition of matters regarding the sale of opiates. Poison, he said, was far too easy to obtain, and a man could easily poison himself if he went to different chemists' shops. The law was such that it could be so sold, and it was time the poisons Act was alte This was the second case of opium poisoning which t had had (see *ante*, p. 703). He thought in the pres case deceased had taken laudanum not intentionally kill himself, but it looked very much like it by the that three bottles were bought, though he had ne had any before. It was advisable to make the regarding poisons a great deal stricter than it w Last week a man was poisoned with opium, s legally it was true, but it was not taken with the c it should be.

The jury returned a verdict of "Death from poi ing by misadventure."—*Bolton Evening News.*

## POISONING BY OXALIC ACID.

The county coroner (Mr. Brighouse) held an adjourned inquest at St. Helens, on March 6, on the body of Robert Bickerstaff, twenty-one years of age, who lodged with Michael Hanlon, of Graham Street, Parr, and who died on Thursday, March 1, from the effects of poison. Bickerstaff was employed at M'Bryde's chemical works. He was at work all Wednesday night, and arrived home at his lodgings about six o'clock on Thursday morning. When he got in he said to a fellow-lodger named Duffy that he would take a dose of Epsom salts. He then mixed something in a cup and drank it. Immediately afterwards, however, he exclaimed, "I have taken poison, and not salts." He at once mixed some salt and water, drank it, and tried to vomit. Dr. Orr was sent for, but when he arrived at 6.30 Bickerstaff was dead. The post-mortem examination made by Dr. F. Knowles showed that Bickerstaff had died from oxalic acid poisoning, and it seemed to be evident that he had taken oxalic acid in mistake for Epsom salts. None of the witnesses at the first inquiry could suggest where the oxalic acid came from, and the coroner adjourned the case for the police to try and find out where it was obtained. After further evidence had been given, the jury returned a verdict that the deceased had died from the effects of drinking oxalic acid in mistake for Epsom salts; that the death was one from misadventure, and that they did not know how the oxalic acid was obtained or from where it came.—*Liverpool Daily Courier.*

## POISONING BY ARSENIC.

Mr. G. Percival-Wyatt has concluded an inquiry at Peckham respecting the mysterious death of Francis Milton McLean, aged eight years, the son of David McLean, a ship's chief officer, residing at 25, Canterbury Road, Peckham, which took place on the 19th ult.

Henry Holly, aged ten years, said that instead of going to school on Thursday, the 8th ult., he went for a walk with deceased as far as High Street, Deptford. On the way home deceased picked up a piece of cake outside a coffee-shop, and bit a piece off. He afterwards threw it away as it tasted nasty. Witness did not have any. The deceased also picked up an onion in the street, and ate a portion of that. No one gave them anything to eat while they were out.

Dr. Thomas Stevenson, analyst to the Home Office, stated that he had made an analysis of the stomach, its contents, and a portion of the viscera, all of which showed signs of an irritant poison. Embedded in the coating of the stomach witness found arsenic crystals, showing that poison had been swallowed in a solid form. The deceased must have had a considerable quantity, as the arsenic was distributed throughout the whole of the viscera.

The Coroner having commented on the mysterious nature of the case, the jury returned an open verdict of "Death from arsenic poisoning, but when or how taken there was no evidence to show."—*Echo.*

### POISONING BY CARBOLIC ACID AND OPIUM.

On February 28, at the Hammersmith Coroner's Court, Mr. Drew held an inquiry with reference to the death of Cecilia Edwards, aged 15 months, the daughter of a shoemaker, residing at 1, Melson Road, Hammersmith, who was poisoned by her father in mistake on Friday, February 23.—The father said that he went to a shelf for a bottle of castor oil and poured a dose down the child's throat, and immediately afterwards found that he had given her the contents of a wrong bottle—some neuralgia liniment, composed of carbolic acid and opium.—A verdict of death from misadventure was returned.—*Morning Post.*

## Reviews and Notices of Books.

### A TEXT-BOOK OF THE PHYSIOLOGICAL CHEMISTRY OF THE ANIMAL BODY; including an account of the chemical changes occurring in disease. Vol. II. —The Physiological Chemistry of Digestion. By ARTHUR GAMGEE, M.D., F.R.S.*

A perusal of this long-deferred second volume of Gamgee's 'Physiological Chemistry,' promised within twelve months in the preface of the first volume published more than twelve years ago, impresses the reader with the immense advance in some branches of physiological chemistry during the interval. Not many years ago the student was taught that albumin was converted by the gastric juice first into syntonin and then into peptone; now he may well be dismayed by the apparently endless series of albumids, albumates, albumoses, antipeptones, hemipeptones, etc., which are recognised as well-differentiated steps in the breaking down of the proteid molecule.

Perhaps the most important chapter in the book is the one on gastric digestion. It commences with a short history of the present state of knowledge on the subject, then there is an account of the chemical and physical characters of the gastric juice; the methods of preparing pepsin; the various researches made to determine the nature of the acidity of the gastric juice; the different indicators—Congo red, o.o. tropaeolin, etc.—used for the purpose, though this subject is more fully discussed in Appendix V.; and the seat of formation of the acid and the various theories propounded to explain its formation. Section X. seems especially important, the author there giving a lucid yet fairly complete account of the researches of Meissner, Kühne, Chittenden, and others, on the action of the gastric juice on the proteids, an account of the most recent work being found in the Appendix. A short account of the milk-curdling ferment "rennin" is followed by a digest of our present and somewhat imperfect knowledge as to the changes of the gastric juice in various morbid states—dyspepsia, cancer, etc.—and the chapter concludes with a full account of the analysis of gastric juice and the detection and determination of the various products of gastric digestion. In a similar way the author recounts all that is known as to the various ferments or enzymes, the action of the saliva and bile, biliary calculi, the secretions of the pancreas and the small and large intestines. In every case there are full references to the original memoirs, with remarks and sometimes hitherto unpublished experiments, elucidating some crucial points.

Another particularly interesting chapter is that on those chemical processes in the intestines which are the results of micro-organisms, such as the production of indol, skatol, etc. Here the misuse, from a chemist's point of view, of the word "indican" must be protested against. The name was originally applied by Schunck to the substance in the urine, which produces indigo when treated with strong hydrochloric acid, under the impression that it was identical with "indican," the precursor of indigo blue in the Indigoferæ. Baumann and Brieger, in 1879, showed that the substance in the urine was entirely distinct from Schunck's "indican," and that it was potassium indoxyl sulphate. Dr. Gamgee gives the correct formula, but still retains the misleading name "indican," which should be given only to the glucoside occurring in the Indigoferæ.

The book seems wonderfully free from misprints, the only one noticed during perusal being "milch" sugar on p. 443, and Dr. Gamgee must be congratulated on the completion of the volume. In conjunction with the earlier volume it constitutes an instalment of what must be considered, when Volume I. is revised and Volume III. completed, as the standard work on this subject. This second volume seems a model of what an advanced text-book should be, with its short history of each subject awakening interest, masterly *résumés* of the conclusions arrived at by modern investigators, and practical directions for confirming the most important results. As a whole it summarises what is known, and singles out with great clearness the weak points in our knowledge, so that the attention of the inquiring student is at once directed to those points which require further investigation.

## Obituary.

Notice has been received of the death of the following:—

On December 22, 1893, James Collins Beard, Chemist and Druggist, late of Clevedon, Somerset. Mr. Beard was accidentally drowned while duck shooting at Najambie, Australia.

On February 19, Mary Sanderson, Chemist and Druggist, Crowland. (Aged 79).

On March 1, James Earp, Chemist and Druggist, Melbourne (Derby). (Aged 76).

## Correspondence.

### BENEVOLENT FUND.

Sir,—May I trespass on your valuable space for a short time to express my great pleasure in reading of Mr. Wiggins's idea, which, as he says, if carried out by every local secretary, may produce a good result. I always have had great pleasure in helping the Benevolent Fund, and shall continue to do so as long as I live and have the means, as I regard it as a grand institution. Sir, I also have an idea, and that is let us all try and make the public help us. The public—for whom we have to go through so much to become qualified to be their servants, for such we really are—yet throw us overboard on every available occasion, and go and purchase all they possibly can at the nearest store, because they get things so much cheaper. Let us make them help us. What if the Society were to send out several thousand subscription boxes, and they could, I think, be had very cheaply from one of the Birmingham firms, painted and labelled to order. I would subscribe with pleasure to this first cost if others would do the same. Send one to every druggist in the kingdom, say, for three, six, or twelve months, to be returned to the Registrar at the expiration of the time which he thinks best, and then opened by him. I think there would be a great result. I feel sure there are many of my customers whom I could persuade to put a coin of some sort into my box, if I had one exposed in a good position in my shop. Again, the assistants might put a sixpence in occasionally, although we cannot persuade them to give a regular subscription of 5*s*. or so. Some will say this is begging. The day has come when we must beg if we want help. It is done for other things. It is done for the Hospital Saturday Fund, for the life boats, for the railway porters' widows and orphans. But I do not recollect ever seeing such a thing in a druggist's shop for his own profession. Why not? Why not try and help our own?

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* London: Macmillan and Co. Pp. i.-xx., 1 to 528, with two chromo-lithographic charts, 18s.

*Rotherhithe.* EDWARD HOGWOOD.

Sir,—Another idea would be for collecting boxes in the shape of mortars, to be supplied by the Society, for placing on chemists' counters, worded as follows, "Please give for the benefit of broken down chemists, their wives and orphans." This might "fetch" a store customer on a Sunday evening when purchasing a penny stamp.

ALBERT PELLEW,
*Divisional Secretary for North Camberwell.*

### MEDICAL MEN AND PHARMACISTS.

Sir,—In reference to a letter under the above heading, which appeared in your issue of February 24, let me state that, as local secretary to the Pharmaceutical Society, I have obtained the opinion of other chemists in Margate, and am at liberty to make reply. We, as a body, fully realise and appreciate our highly-favoured position in respect to the non-dispensing of the medical profession, and, having enjoyed this privilege for about fifteen years, very much regret the necessity for such world-wide publicity of our faults as given in your special benevolent issue, but do what we may to discourage counter prescribing we (especially the old-established) find it difficult both to define our limits and to persuade the unwilling public to consult duly qualified practitioners for simple ailments, or what appear to be such. However, the medical men have found occasion to complain, and we are equally anxious as they to re-establish our legitimate relationships. I think I shall convey the feelings of the chemists when I suggest a speedy solution of the difficulty, viz., that the Medical Society of Margate invite the chemists, or their deputation, to wait upon them at their next monthly meeting, when I have no doubt, as gentlemen with gentlemen, a better understanding will be arrived at, and the purposes of their first letter be fully accomplished.

*Margate.* W. S. HARVEY.

Sir,—Will you grant me a small space in your valuable journal to reply to a letter which appeared in your columns of the 24th ult. from the medical men of Margate, complaining of the iniquities of the chemists of this town. As regards myself I deny the charge of excessive prescribing; moreover, I have done all I could to discourage the practice, and here I will explain. Over two years ago I spoke to three of the medical men on the subject, and asked them if something could not be done to put down prescribing by chemists, believing that a final settlement of this question would tend to our mutual advantage, but my efforts in this direction did not meet with any encouragement. Now, with all due deference to the medical men, I do maintain that when a chemist is honest, and refuses to prescribe, and sends the patient to the doctor, he has a right to expect the prescription. Speaking for myself, it very often happens that the patient is sent elsewhere for the medicine.

I have had occasion to complain of this to the doctors themselves more than once, personally and by letter.

*Margate.* GEORGE STIMPSON.

## Diary of the Week.

### MONDAY, MARCH 12.

*Galen Lodge of Freemasons*, at 5 p.m.
Meeting at Freemasons' Hall.

### TUESDAY, MARCH 13.

*Sheffield Microscopical Society*, at 8 p.m.
Demonstration by B. W. Winder.

*Royal Institution*, at 3 p.m.
"Locomotion and Fixation in Plants and Animals" (ninth lecture), by Professor C. Stewart.

### WEDNESDAY, MARCH 14.

*Pharmaceutical Society of Great Britain.*
General Meeting to consider preliminary arrangements for Annual Dinner, at 11 a.m.
Library, Museum, School, and House Committee, at 12 noon.
Evening Meeting in London, at 8.30.
"The Nature of Aconitine," by Professor Dunstan.

*Edinburgh Chemists', Assistants', and Apprentices' Association*, at 9.15 p.m.
"Dispensing Note," by David Smith.
Communications by Hugh Kerr, Alex. Murray, Robt. Wood.

*Sheffield Pharmaceutical and Chemical Society*, at 8.30 p.m.
"The Microscopical Characters of some of the more important Official Drugs," by W. Kirkby.

*Society of Arts*, at 8 p.m.
"The Fountain Air Brush," by C. L. Burdick.

### THURSDAY, MARCH 15.

*Chemical Society*, at 8 p.m.
"The Action of Hydroxylamine on Formic Aldehyde," by Professor Dunstan and Dr. A. Bosi.

*Chemists' Assistants' Association*, at 8.30 p.m.
"The Chemistry of Agriculture," by T. Tickle.

*Linnean Society of London*, at 8 p.m.
"On Certain Authentic Cyperaceæ of *Linnæus*," by C. B. Clarke.
"On the Development of the Mucilage-Canals of the Marattiaceæ," by George Brebner.

*Royal Institution*, at 3 p.m.
"The Vedânta Philosophy" (third lecture), by Professor Max Müller.

*East Glamorgan Mining Districts*, at 4 p.m.
Meeting of Chemists at Coombe's Restaurant, Pontypridd, to discuss trade and other matters.

*Imperial Institute*, at 8.30 p.m.
"The Rabbit Plague in Australia," by W. D. Severn.

*Midland Pharmaceutical Association*, at 8 p.m.
Smoking Concert.

*Glasgow and West of Scotland Pharmaceutical Association*, at 9.15 p.m.
"Notes on Recent Additions to the Museum of the North British Branch of the Pharmaceutical Society," by J. Rutherford Hill.

*School of Pharmacy Students' Association*, at 7 p.m.
"Materia Medica of the Garden," by H. A. Potter.
"Report on Pharmacy," by W. Moore.

### FRIDAY, MARCH 16.

*Royal Institution*, at 9 p.m.
"The Scientific Work of Tyndall," by Lord Rayleigh.

### SATURDAY, MARCH 17.

*Pharmaceutical Football Club v.* Medical Staff Corps, at Shepherd's Bush, at 3 p.m.

*Royal Institution*, at 3 p.m.
"Light" (sixth lecture), by Lord Rayleigh.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Ince, Kemp, Kershaw, Russell, Thompson.

# THE NATURE OF ACONITINE.*

BY PROFESSOR DUNSTAN, F.R.S.,

*Director of the Research Laboratory of the Pharmaceutical Society.*

In the lecture which I had the honour of delivering before the Society last March, I gave a general account of the present state of our knowledge of the alkaloids contained in the root of *Aconitum napellus*. During the past twelve months considerable progress has been made in the Research Laboratory of the Pharmaceutical Society with the work of further ascertaining the nature and properties of these alkaloids. Their exact physiological action has been investigated by Professor Cash, F.R.S., of Aberdeen, and it is probable that a first account of the interesting results he has obtained will be published during the present year. Professor Cash's preliminary determination of the relative toxic action of the natural alkaloids of the plant has rendered it clear that medical and pharmaceutical interest will chiefly attach to the alkaloid aconitine, since this appears to be the only highly toxic alkaloid of those we have isolated, although the action of benzoyl-aconine ("isaconitine") is very remarkable in certain respects, and may be therapeutically important.

Having in view, then, the importance of gaining precise information as to the nature and properties of aconitine and its relationship to the other alkaloids of the plant, we have, during the past year, directed particular attention to this subject, and I propose this evening to give a brief account of some of the results we have obtained, and to point out their theoretical and practical bearing.

The investigation of the relationship between aconitine and the alkaloid occurring with it in the plant, to which we gave the name of "isaconitine," and which we have recently shown (*Pharm. Journ.*, [3], xxiv., 581; *Journ. Chem. Soc.*, 1894, 174) to be identical with the "picraconitine" of T. B. Groves, has thrown quite new and unexpected light on the nature of aconitine, and has obliged us to abandon the conclusion as to its structure which was arrived at some years ago by Wright and Luff.

The properties of "isaconitine" were very fully described in my lecture last year in connection with its isolation from the plant. It will be remembered that having separated the pure substance, the base and its salts were analysed. The figures obtained agreed well with those calculated from the formula of aconitine ($C_{33}H_{45}NO_{12}$), and the two alkaloids appeared to possess the same composition. The percentage composition of two pure specimens of the base was found to be—

| | I. | II. | |
|---|---|---|---|
| Carbon | 61·11 | 61·03 | per cent. |
| Hydrogen | 6·96 | 7·15 | „ „ |

whilst the percentages calculated from the formula of aconitine, $C_{33}H_{45}NO_{12}$, are

| | | |
|---|---|---|
| Carbon | 61·25 | per cent. |
| Hydrogen | 6·95 | „ „ |

Analysis of the salts gave similar results. But with so large a molecule as aconitine several formulæ may be calculated from the analytical data, and the decision as to which is correct has often to be arrived at from other than analytical evidence. In order to test the accuracy of the conclusion that aconitine and the new alkaloid are isomerides, we made a most careful examination of its hydrolytic products. It was found that on hydrolysis the new alkaloid furnished two, and only two products, viz., aconine and benzoic acid. Now these are the two products which, according to Wright and Luff (*Journ. Chem. Soc.*, 1878, 318), are formed by the hydrolysis of aconitine, which they therefore concluded to be "benzoyl-aconine," the hydrolysis being represented by the equation:—

$$\underset{\text{Aconitine.}}{C_{33}H_{43}NO_{12}} + H_2O = \underset{\text{Benzoic acid.}}{C_7H_6O_2} + \underset{\text{Aconine.}}{C_{26}H_{39}NO_{11}}$$

As we found that the new alkaloid hydrolysed into these same products, it also must be "benzoyl-aconine," and therefore are isomerides of aconitine. The new alkaloid was therefore named "isaconitine."

With the object of gaining further insight into the relationship between these two alkaloids, we made experiments to determine whether they were mutually convertible. After many unsuccessful experiments had been made it was found that aconitine salts very gradually change into isaconitine salts when they are heated at 100° in faintly acidified aqueous solution (*Pharm. Journ.* [3], xxiii., 1045; *Journ. Chem. Soc.*, 1893, 991), and following up this observation we found that isaconitine is invariably formed as an intermediate product in the hydrolysis of aconitine, this alkaloid changing into "isaconitine" before finally becoming aconine. But owing to the readiness with which isaconitine itself undergoes hydrolysis, this is not a satisfactory method of obtaining it. Further experiment, however, put us in possession of an almost perfect method for converting aconitine into isaconitine (*Pharm. Journ.*, [3], xxiv., 582; *Journ. Chem. Soc.*, 1894, 290). When the aqueous solution (about 3 per cent.) of an aconitine salt, preferably the sulphate or hydrochloride, is heated in a closed tube at 120°-130° for two or three hours, it is almost completely converted into the corresponding isaconitine salt, only traces of aconine being formed. In making these experiments it was observed that whilst the solution of the aconitine salt is neutral to begin with, after heating the liquid is strongly acid. This acidity was proved to be due not to benzoic acid, but to acetic acid, and by estimating the amount of acetic acid formed from a given quantity of aconitine it was found to be produced in equi-molecular proportions. A molecular proportion of aconitine, in passing into isaconitine, loses a molecular proportion of acetic acid, that is, 9·27 per cent. Since we had previously observed that isaconitine is always formed in the early stages of the hydrolysis of aconitine, we were led to the conclusion that acetic acid, contrary to the assertion of Wright and Luff, must be one of the hydrolytic products of aconitine.

A large number of experiments have proved that this is the case. Whether the hydrolysis of aconitine is effected by acids, alkalis, or by heating with water alone, a molecular proportion of acetic acid is invariably produced in addition to aconine and benzoic acid. Aconitine is therefore not benzoyl-aconine, as Wright supposed, but "acetyl-benzoyl-aconine." The complete hydrolysis of aconitine is therefore represented by the equation :—

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* The substance of a lecture given at an Evening Meeting of the Pharmaceutical Society, March 14, 1894.

$$C_{33}H_{45}NO_{12} + 2H_2O = C_2H_4O_2 + C_7H_6O_2 + C_{24}H_{39}NO_{10}$$

Aconitine. Acetic acid. Benzoic acid. Aconine.

When aconitine salts are heated with water partial hydrolysis occurs with production of the true benzoyl-aconine ("isaconitine"), the acetyl group being eliminated as acetic acid—

$$C_{33}H_{45}NO_{12} + H_2O = C_2H_4O_2 + C_{31}H_{43}NO_{11}.$$

Aconitine. Acetic acid. Benzoyl-aconine.

It follows from these observations that isaconitine must in future be known by its alternative name benzoyl-aconine, and its composition must be represented by the formula $C_{31}H_{43}NO_{11}$. This formula agrees nearly as well with our analytical results as the aconitine formula, the calculated percentages being—

| | |
|---|---|
| Carbon | 61·48 per cent. |
| Hydrogen | 7·10 per cent. |

The formula of aconine, originally given by Wright as $C_{21}H_{39}NO_{11}$, must in future be written $C_{24}H_{39}NO_{10}$.

The substance obtained by Wright and Luff in 1878 (*Journ. Chem. Soc.*, 1878, 318), by acting on aconine with benzoic anhydride, could not have been "benzoyl apoaconitine" as they supposed, and the product obtained by us early in this enquiry in a preliminary experiment on the action of ethyl benzoate on aconine was probably not "apoaconitine" as we judged it to be from the properties of the very small quantity produced.

By the withdrawal of acetic acid from aconitine under conditions differing from those which obtain in hydrolysis, we have produced a new alkaloid somewhat resembling benzoyl-aconine, and only differing from it in composition by the elements of a molecule of water. We find that when aconitine is heated at its melting point, acetic acid distils from it, whilst there remains behind a base which, having regard to its origin, we propose to name "pyraconitine" (*Pharm. Journ.*, [3], xxiv., 58; *Journ Chem. Soc.*, 1814, 176). By estimating the amount of acetic acid which distils from a given weight of aconitine (9·25 per cent.), we have proved that the decomposition is expressed by the following equation :—

$$C_{33}H_{45}NO_{12} = C_2H_4O_2 + C_{31}H_{41}NO_{10}.$$

Aconitine. Acetic acid. Pyraconitine.

Pyraconitine is crystalline (m.p. 166°), and forms crystalline salts. It has a bitter taste, and does not give rise to tingling, as aconitine does. Like benzoyl-aconine it is not poisonous, at any rate not in small doses, so that the withdrawal of acetic acid (as in the production of pyraconitine) or the replacement of the acetyl group by hydrogen (as in the production of benzoyl-aconine) quite abolishes the remarkable toxic power of aconitine. Pyraconitine is sharply distinguished from benzoyl-aconine, of which it appears to be the anhydro-derivative, in not furnishing an aurichlor derivative, but only an aurichloride of the usual type.

Pyraconitine is very readily hydrolysed by alkalis, so readily that if soda is added in slight excess to the solution of a pyraconitine salt, the white flocculent precipitate which is produced at first, quickly dissolves, owing to the hydrolysis of the alkaloid into the soluble pyraconine and benzoic acid.

$$C_{31}H_{41}NO_{10} + H_2O = C_7H_6O_2 + C_{24}H_{37}NO_9$$

Pyraconitine. Benzoic acid. Pyraconine.

Pyraconine closely resembles aconine, of which it appears to be the anhydride, and like aconine it is not poisonous.

The following table summarises the relationship between aconitine and the several non-poisonous derivatives we have described. It may be remarked here that we have shown that benzoyl-aconine and aconine occur in the plant, together with aconitine :—

| | |
|---|---|
| Aconitine (Acetyl-benzoyl-aconine) | $C_{33}H_{45}NO_{12}$ |
| Benzoyl-aconine ("picraconitine," "isaconitine") | $C_{31}H_{43}NO_{11}$ |
| Pyraconitine (anhydro-benzoyl-aconine) | $C_{31}H_{41}NO_{10}$ |
| Aconine | $C_{24}H_{39}NO_{10}$ |
| Pyraconine (anhydro-aconine) | $C_{24}H_{37}NO_9$ |

From the pharmaceutical point of view these results are of considerable importance, for having proved that the formation of a constant quantity of acetic acid on heating and on hydrolysis is a characteristic property of aconitine, not exhibited by the other alkaloids which accompany it in the root, we have been able to found on this fact an accurate process for the estimation of aconitine in presence of the other alkaloids, the amount of acetic acid furnished by the total alkaloids being calculated into aconitine. The subsequent determination of the amount of benzoic acid yielded by the hydrolysis of the total alkaloid enables the quantity of benzoyl-aconine to be estimated. During the past two months this analytical method has been tested in various ways, and a detailed account of it will be given in the course of the present session. The standardisation of the galenical preparations of aconite will then for the first time become possible. Once again an admirable illustration is afforded of the great truth, not yet generally recognised in this country, that real progress in pharmacy can only be achieved by an application of the methods of scientific chemistry.

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## PHARMACOGRAPHIC METHODS.*

BY L. BRAEMER.

### *Definitions.*

Like the authors of 'Pharmacographia,' the writer employs the term "pharmacography" to indicate that branch of medical and pharmaceutical science which treats of the origin and characters of medicinal substances derived from plants and animals. This term appears to offer the following special advantages :— It corresponds well, etymologically, with the object of study ; is much more precise than the terms "pharmacology" and "materia medica," the ground covered by which varies considerably in extent according as the subject matter is regarded from the point of view of pharmacy or therapeutics ; it is shorter than "natural history of medicaments" (Virey),† "natural history of crude drugs" (Guibourt),‡ or "descriptive study of natural medicaments" (Herlant) ;§ also less barbarous and more euphonious than "drugology" (Meyer),[*] or "pharmacognosy" (Martius),[†] terms adopted in Germany.

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* From the 'Bulletin de la Société de Pharmacie du Sud-ouest.'

† 'Histoire naturelle des médicaments.' Paris, 1820.

‡ 'Histoire naturelle des drogues simples.' Paris, 1849-51.

§ 'Étude descriptive des médicaments naturels.' Bruxelles, 1888-92.

### *Descriptive Method.*

From a remote period, and until the middle of the present century, pharmacography was exclusively descriptive. External characters and organoleptic properties were the only factors considered in the determination of a crude drug. The shape, dimensions, surface appearances, fracture, colour, odour, and taste were noted with the greatest care; and there exist descriptions by such investigators as Guibourt which are marvels of clearness, precision, and conscientious work. But the characters cited in such descriptions are essentially variable, and may lead to the varieties of drugs being multipled almost without end. The personal factor of the worker has, indeed, more often contributed to the establishment of varieties than a real or important difference in the quality or origin of the products described.

### *Anatomical Method.*

The anatomical structure of the substances, on the other hand, shows a stability and constancy which are lacking in the external characters. It was Schleiden who first showed, in 1844, the importance of anatomical characteristics in determining and distinguishing crude drugs of vegetable origin. Three years later he demonstrated the value of his suggestions in his work on the sarsaparillas,[‡] the insufficient knowledge concerning which was then complicated and confused because of the erroneous notions current regarding the botanical origin and geographical source of these roots. In 1849 Weddell distinguished the cinchona barks from one another by similar means.[§] The path being thus opened, these monographs were followed by the general studies of Oudemans,[||] Schleiden,[¶] and Berg;[**] and the points neglected by the first investigators were little by little elucidated as time passed on.[††] The numerous researches since undertaken on all sides have led to the following rule being formulated by Planchon[‡‡]:—"Drugs of the same group, furnished for example by the same genus of plants, present in general common characters which permit of comparison between them; but, at the same time, they have specific characters which enable them to be distinguished with certainty." Sarsaparilla roots, cinchona and cinnamon barks, solanaceous and rutaceous leaves, and many other examples, prove the truth and generality of this rule. Botanists have, in their turn, followed the lead of the pharmacographers, and the study of the comparative anatomy of plants has greatly modified the systematic botany of recent years. Anatomical researches have also shown that it is easy to distinguish between substances which are confused by their external characters, such as the true and false angustura barks, etc., by studying microscopic sections. Lastly, in certain cases, they permit of the recognition of the botanical origin of mere fragments of plant organs. It is thus that the investigator quoted above has been able to attribute certain specimens to *Strychnos*, and the same principles, applied to the study of powdered organic substances, have proved of equal service there. Where the ordinary microscopical and chemical examination may prove useless, or tedious and difficult in application, a thorough study of anatomical characteristics often permits determinations to be made with great facility and accuracy.

(*To be continued.*)

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[*] 'Wissenschaft. Droguenkunde.' 1892.

[†] 'Grundriss d. Pharmacognosie.' 1832.

[‡] 'Beitrage z. Kentniss der Sassaparille' (Archiv. d. Pharmacie). Hanover, 1847.

[§] 'Histoire naturelle des quinquinas.' Paris, 1849.

[||] 'Aanteckeningen, etc.' Rotterdam, 1854-56.

[¶] 'Handb. d. botan. Pharmacognosie.' Leipzig, 1867.

[**] 'Anatomischer Atlas.' Berlin, 1865.

[††] Lemaire. 'Détermination histologique des feuilles médicinales.' Nancy, 1882.

[‡‡] 'Contribution à la matière médicale depuis, 1789.' Paris, 1892.

## THE UNITED STATES PHARMACOPŒIA OF 1890.[*]

BY GEORGE M. BERINGER.

Twenty-seven pages are devoted to volumetric solutions and methods of analysis. We regret that this feature of the book has been marred by a statement made exactly twelve times in the twenty-seven pages "that the figures given may be rounded off when a delicate balance and exact weights are not at hand." This is the more remarkable, as in the introductory note to this subject it is insisted that all volumetric solutions should be made and used at temperatures not deviating materially from the normal temperature, 15° C., and that all measuring vessels employed should agree among themselves in accuracy of graduation, thus avoiding the introduction of errors.

What chemist can, with any satisfaction, make volumetric determinations, using an inaccurate balance and weights?

In a volume whose chemical requirements are so exacting, such slovenly methods should not be condoned. Especially is this to be condemned in the preparation of such volumetric solutions as those of oxalic acid and iodine used to standardise other solutions.

Two pages are devoted to each of the following subjects, gasometric determinations, alkaloidal assay by immiscible solvents, and determination of optical rotation of organic substances.

Eight pages are required for a list of chemicals and formulas.

It will be thus seen that sixty pages, one-tenth of the entire volume, are devoted to purely chemical instruction, in addition to the many pages already occupied in the tests appended to the official products in the preceding pages. The increase of 115 pages in the present edition, amounting to more than 20 per cent. in the size of the volume, is largely due to this source. This may well serve to illustrate the present tendency of pharmaceutical training toward a more thorough education in chemistry. But it must not be forgotten that if the same privilege be extended to pharmacognosy, pharmacology, botany in its various relations to organic materia medica, and other allied sciences, that has been assumed by chemistry, the pharmacopœia would soon become a commentary upon itself, and a volume so cumbersome as to be unsuited to its purpose and use.

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[*] Extract from a review published in the *American Journal of Pharmacy*.

The pharmacopœia should not be converted into a text-book on any science. It is with regret one observes that the present tendency is to forget entirely its legitimate character. The pharmacopœia is essentially a law book, a volume of statutes. As such it should content itself with stating accurately the characters and requirements of the official products. Any deviation from this rule is a digression from its true scope. The official volume of the statutes enacted by a legislative body is unaccompanied by explanations and judicial opinions on the application of the laws.

It is to be hoped that, in future revisions, the plan adopted will be to leave the methods of testing and of proving the purity of the official chemicals to a special volume, compiled, if necessary, by authorities recognised by the pharmacopœial committee. A volume which shall be to the United States Pharmacopœia what Pribram and Welden's 'Prüfung Artzneistoffe' is to the new German Pharmacopœia.

Thirty-seven pages are utilised for the various tables, those for alcohol, the acids and alkalies, and for equivalents of weights and measures, being especially noticeable for completeness. Forty-two pages are devoted to the very thorough index, which is one of the most commendable features of the book.

Viewed as a complete work, the volume is remarkable for its advanced position; for the great progress which it indicates in the coming pharmacist. Its progressiveness and superiority from a purely scientific standpoint is admitted. The committee evidently had in mind a lofty ideal for their pharmacopœia. The book is at least a decade in advance of the scientific attainments of the average American pharmacist, and is likely to give the impression to our foreign professional brethren that he is the possessor of knowledge and standing, alas, too often lacking. We imagine that we hear many of the class who are more concerned over the commercial aspect than the professional side of their calling repeat the words of the horse to his groom in Æsop's fable, "Groom me less and feed me more."

I firmly believe that this is a grand step, and that it will mark a distinct epoch in American pharmacy; that it will stimulate hosts of pharmacists to renewed efforts to maintain their educational and professional standing, and that it will compel many to a more thorough education in order to stand on the same plane to which this volume will elevate the progressive pharmacist. It is a matter of profound regret that in a volume of such magnificent intent there should be so much to criticise adversely.

In concluding this review the writer wishes to explain that it was undertaken in response to the request of the late editor of the *American Journal of Pharmacy*, Professor John M. Maisch, for a criticism to be published in parts, commencing with the October (1893) number of the journal.

In discharging this task, I have conceived it to be my duty, as well as to the best interests of pharmacy, o unhesitatingly express my views. It has been the aim to avoid all personalities, and if any one has been offended it has been unintentional. The writer has no axe to grind, and is personally acquainted with but few of the committee, nor has he any knowledge as to which members of the committee the various parts of the volume can be attributed. I have naturally assumed the position expressed by Mr. Hosea Biglow's candidate:

> "There's nothin' thet my natur so shuns
> Ez bein' mum or underhand;
> I'm a straight-spoken kind o' creetur
> Thet blurts right out wut's in his head,
> An ef I've one pecooler feetur,
> It is a nose thet wunt be led."

Hardly had the introductory lines of this review appeared before the writer was criticised as a pessimist, and his review as being hastily written. In opposition to some of the views expressed very flattering reviews were quoted. I have no intention of replying to my critical friend, who so evidently has misconstrued my position, nor is any defence needed. But I would assure him that it is much easier to flatter than to conscientiously criticise; to swim with the current than to stem the tide. But the latter may be the position of duty, and a review to be of any value must be the expression of independent thought, and devoid of flattery.

## TRIKRESOL.

Under this name a purified mixture of ortho, meta, and para cresol has been introduced for surgical purposes. It is a clear, colourless liquid, having an odour like creasote, and boiling between 185° and 205°. The specific gravity is from 1·042 to 1·049 at 20°C., and it is said to be almost, if not entirely, free from phenol. The purification of this product from neutral hydrocarbons has been carried out so that the purified product will dissolve in water to the extent of from 2·2 to 2·5 per cent., which is amply sufficient for its application in surgical practice, for which purpose a solution containing from 0·5 to 1·0 per cent. is strong enough on account of the great disinfecting power of the cresols By means of this purification it is thought that the necessity for adding emulsifying agents to cresol in order to obtain sufficiently strong solutions will be done away with. Gruber's determinations of the solubility of cresols in water gave the following results (*Archiv. f. Hyg.*, 17):—

| | Per cent. |
|---|---|
| Orthocresol | 2·50 |
| Metacresol | 0·53 |
| Paracresol | 1·80 |
| Mixed cresols from toluidine | 2·20 |
| „ „ „ tar oil | 2·55 |

## AMOUNT OF VOLATILE ACIDS IN RANCID BUTTER.

To determine this point, E. v. Raumer has examined a sample of butter kept since July, 1888, when it gave a Reichert-Meissl number—26·8 and 26·9. In October, 1889, the butter gave 28·5 and 28·8; in February, 1890, it gave 31·6 and 31·9, and in January, 1892, it gave 30·3 and 30·1. The amount of free fat acids in 1892 was considerable, 100 grammes of the fat requiring 21·1 C.c. of normal potash solution, but there was no evidence of reduction in the amount of volatile fat acids.—*Forsch-Ber. uber Lebensmittel, etc.*, 1893, p. 22.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, MARCH 17, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE ADMINISTRATION OF THE PHARMACY ACT, 1868.

IN connection with the prosecutions instituted by the Pharmaceutical Society in cases of infringement of the Pharmacy Act, 1868, attempts have recently been made to charge the Society with a desire to create, in favour of chemists and druggists, a monopoly in the sale of articles which are poisons within the meaning of that Act. Under the prevailing inclination for open competition in trade, as in other pursuits, such a charge is in any case likely to excite sympathy and, if there were any substantial foundation for it, some question might arise as to the propriety of the steps now being taken as to the administration of the Pharmacy Act. But in reality the charge which has been made is a pure fiction. It is not with the object of creating a trade monopoly for the advantage of chemists and druggists that the extended application of the Act is being enforced. It is because the Society, as the official representative of the body, has been moved to exercise more stringently the powers conferred upon it by Parliament. If there be one circumstance more than another by which chemists and druggists collectively have laid themselves open to reproach, from the point of view of public interests, it is in having failed to take greater advantage of the legislative provisions for restricting the sale of articles to which the Pharmacy Act relates. The express intention of that Act was to confine the trade in those articles to the hands of legally qualified persons, and in that sense to make it a monopoly. The object was not the advantage of chemists and druggists, but the safety of the public. For that reason the restriction of trade in the articles referred to was accompanied by other conditions and obligations calculated to secure that object. The general effect of the enactment has already been beneficial, but it is felt that the administration of it has fallen short of producing the full effect that is held to be desirable, and the action now taken is in response to that feeling.

The grocers and provision dealers who have recently been, like other unregistered persons, the object of prosecutions under the Pharmacy Act, are not alone in putting forward the above mentioned charge as a possible means of securing their indemnification. Within the last few weeks a correspondence has been carried on in the *Glasgow Herald* on the subject of "Doctors and Druggists," in the course of which the same charge has been made in reference to the prosecution of unregistered persons acting as assistants in chemists' shops kept by medical men in Glasgow. Objection has been taken to the action of the Society in enforcing the law, upon the assumption that unqualified assistants in shops kept by chemists are not interfered with when they neglect to observe its provisions. That assumption is incorrect, for in the first prosecution of the kind, which led to the judicial construction of the Act in regard to assistants, it was an assistant of a duly qualified chemist who was the subject of prosecution. Moreover, the prosecution was not undertaken in such a way that there can be any reason for the statement that it was instigated by selfish motives; but it was undertaken in consequence of strong representations from a coroner that any question there might be as to the better application of the law should be put to the test of judicial trial.

In regard, again, to the sale of secret preparations by unregistered persons, the fact that many of these articles contain poison has been pressed upon the Society from without by medical men and others. On the ground that the sale of such articles by unqualified persons is contrary to the provisions of the Pharmacy Act, and for the further reason that the Pharmaceutical Society has been entrusted with the administration of that Act in the public interest, it has been urged that the practice complained of should be stopped, and that it was the duty of the Society to take steps for effecting that object. Arguments of that nature could not be disregarded, and supported as they were by a communication from the Treasury department calling attention to the facts of the case, there was no alternative but to seek for a decision in the law courts whether the sale of secret medicinal preparations which are poison within the meaning of the Act is or is not within the purview of the Act. That question is primarily one affecting public safety. It is from that point of view it has already been partially decided, and it is from that point of view its further decision must be arrived at. Any limitation of the trade in the articles referred to which may be contingent upon the settlement of the question that has now been raised will be a limitation imposed out of regard for the interests of the public, and not for establishing a trade monopoly. If restriction of the sale of such articles to legally qualified persons be held to be desirable, any advantage that would thus accrue to chemists from observance of the law in that respect would be accompanied by responsibilities incompatible with transactions in the ordinary course of trade, and incapable of being fulfilled by those who have not special qualification for the purpose. The trade advantage to chemists and druggists would in fact be entirely a matter of secondary importance.

Some of the writers in the *Glasgow Herald* appear, however, to be possessed by the idea that the Pharmacy Act, 1868, was originated by the Pharmaceutical Society as a kind of trade union means of protection for persons belonging to the body it represents, and that erroneous impression is the only foundation for the opinions and arguments they put forward. A letter signed "Pharmacist" in the *Herald* of the 2nd inst. gives the most suitable refutation of this fallacy when it points out that, as a body incorporated by Royal Charter and entrusted by statute with administrative powers, the Pharmaceutical Society is subject in all it does to the control of the Privy Council, and is not the self-seeking, irresponsible corporation which some would endeavour to make it appear. The primary object of its statutory powers is to secure the interest of the public. With that object the duties of testing and certifying the fitness of chemists and druggists, by the exercise of those powers as an examining body, is imposed upon the Society, as well as the further duty of maintaining a register of the persons entitled under the Act to carry on the business of a chemist and druggist. The power of prosecuting offenders against the Act has the same object, and it involves the duty of acting when occasion requires.

There is no doubt, however, that the powers possessed by the Society comprise some further potential influence, capable of being exercised for the special benefit of the members of the trade it represents by their co-operation with that object. But such influence has not hitherto been exercised to any appreciable extent. Any effect that might be thus produced would moreover be due rather to the initiative and united action of the trade than to the statutory powers of the Society, although these, together with its position as a chartered body, furnish an eminently favourable basis for such action directed from within to the promotion of individual and general interests. It cannot be until the trade and the Society are practically one and the same, and when the antagonistic tendencies now existing within the body shall have ceased to exist, that such a result can be hoped for. Meanwhile the Society, though constituted only of a fraction of the trade, is preparing for the realisation of a better state of pharmaceutical affairs by steadily pursuing the course of action through which it has gained recognition and appreciation, fostering education, and gradually regulating the practice of pharmacy by performing its statutory functions in granting qualification and repressing infringement of the law. Many circumstances have contributed towards rendering progress on those lines slow. The very question which has now been raised as to the sale of proprietary medicines might have been raised any time since the Pharmacy Act was passed. But if that question had been raised by the Society's initiative there would have been greater opportunity for making the objection that a desire to secure a monopoly was the motive. That charge cannot now be sustained, and the fact that the Society has not taken action until moved to do so from without is the best proof that no such selfish motive has been allowed to influence its procedure.

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## BOTANICAL NOMENCLATURE.

The specific names of plants are either adjectives or substantives used as adjectives, and they begin in certain cases with a capital letter, this being customary when the specific name is an old generic one or derived from the name of a person, whilst occasionally capitals are used in other instances. The advantages claimed for this system are not generally appreciated, however, and it is doubtful if the trouble it frequently occasions, when employed elsewhere than in standard lists of plant names such as the *Index Kewensis*, is to any extend repaid, whilst the obloquy incurred by the average writer who unwittingly infringes the rule is utterly disproportionate to the magnitude of his offence. What is chiefly required in a plant name, so far as most persons are concerned, is that it should definitely distinguish a given plant from all other plants, and this does not necessitate any variation in the size of letter used as initial. If plant names were dealt with as other proper names, both generic and specific terms would invariably be commenced with capital letters, though there could be no objection on the score of accuracy if small lettters were used always. It is usual, however, to avoid the use of capitals in most specific names, and it would be decidedly more convenient generally if they were never employed in that connection in ordinary letterpress. It is therefore satisfactory to note that, in the first issue of the new series of 'Science Gossip,' which has just appeared, the editors inform their contributors and correspondents that "capitals may only be used for generic, and not specific names." The tendency of this rule being towards greater simplicity, without in any degree impairing strict accuracy, it will henceforth be adopted in the pages of this Journal.

### IMPERIAL INSTITUTE.

On Friday, March 9, Mr. Clement Markham, C.B., F.R.S., delivered a lecture at the Imperial Institute on "Coca Cultivation," the chair being taken on the occasion by Mr. Michael Carteighe, President of the Pharmaceutical Society. The lecture, which was popular rather than technical, was extremely interesting. Extended reference was first made to the importance, from an economic point of view, of the cultivation and transmission from their native soil to other countries of medicinal and food-producing plants. Thus the extended distribution and cultivation of cinchona, tobacco, cassava, sugar-cane, and numerous other plants and products, were considered in their bearing upon industry and popular habits. The methods adopted in the cultivation of the coca plant in Peru were then briefly described, and the large amount of leaves and cocaine exported alluded to. Subsequently, remarks upon the subjects dealt with were made by Sir George Birdwood, Mr. William Martindale, Mr. E. M. Holmes, and other gentlemen, including the recently appointed Peruvian Consul, and on the motion of the chairman, who spoke of the inestimable value of Mr. Markham's labours in connection with the acclimatisation of the cinchona tree in India, a vote of thanks was accorded the lecturer by acclamation.

### THE ANNUAL DINNER.

At a meeting held at 17, Bloomsbury Square, on Wednesday last, it was decided that the annual dinner of the members of the Pharmaceutical Society and their friends should be held at the Whitehall Rooms, Hotel Métropôle, on Tuesday, May 22. The price of the dinner tickets—which will be obtainable only from the Honorary Secretary—will be, as formerly, one guinea (inclusive). A committee was appointed to carry out the necessary arrangements, consisting of the following gentlemen:—the President of the Society (Mr. Michael Carteighe), the Vice-President (Mr. W. Gowen Cross), the Treasurer (Mr. R. Hampson), Professor Attfield, Dr. B. H. Paul, Messrs. Allen, Butt, Feaver Clarke, Hills, Hopkin, R. A. Robinson, G. S. Taylor, Chas. Umney, and Richard Bremridge, who has also kindly undertaken the duties of Honorary Secretary. A list of stewards will shortly be published, and gentlemen desiring of acting in that capacity are requested to send in their names to Mr. Bremridge as early as possible.

### MAGISTRATES AND CHEMISTS.

A brief report will be found at page 792 of a case before the Penge magistrates, in which a girl of seventeen was charged with attempted suicide by oxalic acid. The chief interest in the case for pharmacists, however, centres in the remarks made by the Chairman of the Bench, who is reported as saying that "he was quite aware the Act relating to the sale of poisons omitted to include oxalic acid in the schedule." As is well known, this poison was one of the earliest to be scheduled under the Pharmacy Act, and since in the present instance all the usual precautions appear to have been taken by the seller, who is properly qualified under the Act, the tone adopted by the magistrate in animadverting without reason upon Mr. Lines' conduct was totally unjustifiable, to say the least.

### BENEVOLENT FUND.

As the result of the Chemists' Ball we understand that the sum of twenty guineas has been placed to the credit of the Benevolent Fund. It is also announced that one hundred pounds has been bequeathed to the Pharmaceutical Society for the benefit of the Fund by the late George Baggett Francis, of the firm of Hearon, Squire, and Francis, who died on December 2 last.

### SQUIRE'S COMPANION, SIXTEENTH EDITION.

The issue of a new edition of this work, recorded in our notices of new publications, is an event of practical interest to pharmacists with which most of our readers will be glad to be acquainted. The volume, which is appropriately dedicated to the memory of the late Sir James Clark, has acquired considerable increase in bulk as compared even with the previous edition, and although various endeavours have been made to economise space, the very considerable addition of new matter has increased the work by seventy-three pages, while the text occupies one hundred and eighty-nine pages more than in the last edition. The price of the work is also increased to twelve shillings and sixpence.

### RESEARCH LABORATORY.

In the official report of the commissioners appointed to consider the draft charter for the proposed Gresham University in London, a recommendation is made that provision should be made for the development of chemistry as applied to pharmacology, and it is noted that for the study of this application of the science "there is an admirable, but small, laboratory at the Pharmaceutical Society, where, in addition to educational work, much valuable research has been done. It suffers much from want of funds, and requires extension so as to provide for work which cannot for want of space be carried out." It is further suggested that "the Physic Garden at Chelsea would also be valuable for the study of pharmacology, in connexion with which it was originally founded," and that if it were made available for experimental purposes in connexion with the study of chemistry applied to the physiology of plants, a valuable aid would be provided for the effective prosecution of that study and of chemistry as applied to agriculture.

### HENRY AYSCOUGH THOMPSON.

Many of our readers will share the regret with which we record the death of Mr. Henry Ayscough Thompson, at the age of seventy-five, one of the oldest members of the Society, a liberal supporter of the Benevolent Fund, and formerly one of the auditors of the Society.

### SCHOOL OF PHARMACY.

The summer term at the Society's School of Pharmacy commences on Thursday, April 19. Full particulars of the courses of lectures, demonstrations, and laboratory instruction in Chemistry, Botany, Pharmacy, and Materia Medica and Histology may be obtained from the Secretary to the School, Mr. F. W. Short, 17, Bloomsbury Square, W.C.

### QUININE IN THE UNITED STATES.

In a paper dealing with quinine from a historical standpoint, read before the Virginia Pharmaceutical Association at its last meeting, Mr. Robert Brydon records some striking figures representing the amounts of the alkaloid and its salts imported into the United States during a number of years. From 1867 to 1892 inclusive the lowest quantity of sulphate of quinine imported during any one year was 10,861 ounces, valued at 12,261 dollars, in 1871; and the highest was 3,079,000 ounces, valued at 805,821 dollars, in 1891. The importation of other salts of quinine varied from 97 ounces, valued at 248 dollars, in 1883, to 156,442 ounces, valued at 29,366 dollars, in 1892. Imports of cinchonidine dropped from 609,576 ounces in 1888, to 11,483 ounces in 1892. The total amount of quinine and its salts imported from 1884 to 1892, inclusive, was 21,764,785 ounces, valued at 9,288,652 dollars. Of this quantity Germany contributed 15,868,903 ounces, Great Britain 3,500,510, Italy 2,006,772, France 269,386, the Netherlands 88,950, Belgium 25,590, and other countries 4,674. The rates of duty imposed on quinine by the U.S. Government fluctuated from 15 per cent. in 1832 to 45 per cent. in 1862. The latter rate continued until ten years later, when the impost was reduced to 20 per cent., and in 1879 quinine was admitted free, and remained so afterwards, in spite of strenuous efforts on the part of American manufacturers to have the duty replaced. Since quinine was introduced into the American market, its price has fluctuated considerably, but the general tendency has been in a downward direction, the extreme limits being from twenty dollars per ounce in 1823 to as many cents in 1893.

### INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

We are informed that the preliminary arrangements of the eighth International Congress of Hygiene and Demography, to be held at Budapest from the 1st to the 9th of September this year, are already far advanced. As many as 440 papers are already promised by foreign scientists. The number of the sections has been increased by one, under the title "General Samaritan Affairs." The interest of the Congress will be enhanced by the circumstance that the medical officers of the German railways and the cremation societies will hold their meetings at Budapest in connection with the Congress. The Congress will be opened by His Imperial and Royal Highness Archduke Charles Louis, and the introductory meeting will take place in the Building and Garden of the National Museum. The Corporation of Budapest will arrange a soirée in connection with the reception of the Congress. The 6th of September is reserved for minor excursions, such as the inspection of public institutes and edifices, a trip to Balaton-Füred, Siófok, and by invitation of Count Nicolas Eszterhazy to Totis, also excursions to the Széchenyiberg, the Island of St. Margherite, etc. The programme of the excursions to be made after the closing of the Congress has been extended, so that besides a voyage to Constantinople and Belgrade, excursions to Tatrafüred, Agram-Fiume, and to Bosnia and the Herzegovina, have been added to the programme.

## Transactions of the Pharmaceutical Society.

### DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 14th inst., the Librarian and Curator presented the following reports of donations to the Society's Libraries and Museums:—

*To the Library in London.*

**Smithsonian Institution, Washington, U.S.A.:**
Annual report of the Board of Regents, 1891.

**University of Durham:**
Calendar, 1894.

**Pharmaceutical Society of Ireland:**
Calendar, 1894.

**California College of Pharmacy:**
Prospectus, 1894.

**Pharmacy Board of Victoria:**
Pharmaceutical register for 1893.

**Mr. C. A. Barber, M.A., St. John's, Antigua:**
Three supplements to the Leeward Islands Gazette, 1894.

**Mr. F. M. Bailey, Brisbane:**
Queensland, Department of Agriculture, Botany Bulletin, no. 8, 1893.

**École supérieure de pharmacie de Paris:**
Alcools aldéhydes et alcools acétones, par C. Astre, 1894.
De l'allotropie des corps simples, par D. Berthelot, 1894.
États allotropiques des corps simples, par M. Meslans, 1894.
États allotropiques des corps simples, par L. Ouvrard, 1894.
De la dissociation, par H. Causse, 1894.
La dissociation, par H. Imbert, 1894.
Composés pyridiques et hydropyridiques, par C. Moureu, 1894.

*To the Library in Edinburgh.*

**Pharmacy Board of Victoria:**
Pharmaceutical register for 1893.

*To the Museum in London.*

**Mr. J. Mitchell:**
Specimen of single Camomile Flowers and of double Camomile Flowers.

**Mr. J. H. Hart, F.L.S., Botanic Gardens, Trinidad:**
Large specimen of the leaves and stems of *Piper ovatum*; specimen of the fish poison, *Clibadium badiori*.

*To the Museum in Edinburgh.*

**Mr. J. S Liversidge, Edinburgh:**
Seeds of *Carica papaya*.

**Messrs. Hodgkinsons, Treacher, and Clark, London:**
Flowers of closed, half-closed, and open varieties of *Pyrethrum cinerariæfolium*.

**Mr. George Melvin, Edinburgh:**
Specimen of Scammony attacked by a small beetle and containing a large percentage of starch.

*To the Herbarium.*

**Dr. C. Schumann, Berlin:**
Specimens of *Strophanthus gracilis*, *S. Fischeri*, *S. Petersianus*, *S. Preussii*, *S. sarmentosus*, and *sarmentosus* var. *verruculosus*.

## EVENING MEETING IN LONDON.

*Wednesday, March* 14, 1894.

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The President took the chair at half-past eight o'clock, and at once called upon Professor Dunstan to give his lecture on

### The Nature of Aconitine,

the substance of which will be found at page 773. The lecture was illustrated by lantern slides and experiments and, in conclusion, the lecturer expressed his thanks to Mr. Francis H. Carr for the trouble he had taken in arranging the illustrations for the lecture.

The President said Professor Dunstan deserved their thanks and congratulations for the way in which he had brought forward this rather difficult subject. The *cui bono* question, which was not so often raised now as it was formerly in connection with scientific education, had been abundantly answered. As the position of the pharmacist in the future depended far more on his personal qualifications than on any protection by the State, so did the reputation of the Society depend on its recognising in its corporate capacity that research work must be thorough and scientific. He was very glad to find that the work of their old friend, Mr. Groves, a former pupil in the school, had been referred to, and it also showed the practical bearing which work at the outset apparently chemical rather than pharmaceutical had upon questions which interested them all. Mr. Groves was about the first to do really scientific work on aconite, and it was very gratifying to find that his results had been to a great extent confirmed. He concluded by proposing a vote of thanks to Professor Dunstan.

Mr. Naylor, in seconding the motion, expressed the hope that the results now brought forward would be published in full, and remarked that they were singularly in accord with some portion of the work done in another country. Nevertheless, he hoped they would not be in too great a hurry to standardise preparations of aconite, as further results of importance might yet be obtained.

Mr. Hills asked if solutions of aconitine salts would be stable, or would hydrolysis be likely to take place gradually, and so render such preparations inactive.

The vote of thanks having been carried,

Professor Dunstan, in reply, said if aconitine salts were kept in an aqueous solution for a long time, they might undergo some change, but the action would be very slow, and he doubted whether it would be of practical importance. Strong solutions had been kept for some months without any perceptible change. This work on aconite was not always pleasant or encouraging, but the subject had been so long in abeyance that he felt it his duty to try and arrive at some sort of settlement of it. With regard to what had been done in Germany, he had purposely omitted any reference to it, and did not wish to say much now, as he had already expressed his opinion in the Journal. He might say, however, that he felt the German chemists had been poaching on their preserves. It was generally recognised in England that one should not enter upon a subject on which another man was known to have been long working without communicating with him, and as chemistry was, or ought to be, international, it seemed to him that the same rule should be recognised by foreign workers. Fortunately they had published their results in time to secure priority.

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## EVENING MEETING IN EDINBURGH.

*Wednesday, February* 28, 1894.

MR. J. LAIDLAW EWING IN THE CHAIR.

*(Continued from page* 759).

The discussion on the United States Pharmacopœia of 1890 was opened by the reading of the following communication:—

### Hints from the United States Pharmacopœia.

BY C. A. MACPHERSON.

It is always well to learn all that we can from others, and try to profit from their experience, so that while striving to attain a high standard of excellence we may escape the errors into which they have fallen. With this object in view it may not be unprofitable for us to examine more or less minutely the recently published Pharmacopœia of the United States. Bearing in mind the announcement that the publication of a new edition of the British Pharmacopœia is contemplated, the issue of the fore-mentioned book is all the more opportune, as we are thus enabled to compare it in its latest development with our own national "book of medicines," and perchance may cull from it some hints for the improvement of the latter. This is all the more likely when it is remembered that it is essentially a pharmacist's book, and that some of the foremost men in pharmacy have been engaged in its compilation. The following remarks, which are a few thoughts suggested by a somewhat superficial examination of the book, are expressed chiefly for the purpose of eliciting the opinions of others on the points touched upon.

It might be well if the American example were followed by us, and the metric system of weights and measures adopted in the making of pharmacopœial preparations, leaving to the option of medical practitioners the use of either the metric or the apothecaries' weights and measures in prescribing. Doses could be stated in the pharmacopœia according to both systems. To make the change absolute at once might be too abrupt, and the suggestion of it would no doubt lead to much opposition. To render the transition easy the formulæ for the various preparations could be stated in the next edition of the pharmacopœia according to both the imperial and metric systems, while by the time that another edition was required the metric formulæ would have become so familiar that the other might be dropped without inconvenience. To save space the formulæ could be set out under the two systems in parallel columns, the quantities in the one column not necessarily being the equivalents of those in the other, the only requisite being that the relative proportions in each column should be the same. This would only be an extension of a practice already partially carried out. Where it was necessary to state quantities in the directions they could be given according to the one system, and the proportional quantities required by the other inserted in brackets. The introduction of the fluid grain for prescribing and compounding purposes, it is to be feared, would only increase the confusion which at present exists, and it seems inadvisable to tinker at our present system of weights and measures, trying to adapt it to another which is foreign to it. At best it would only be a temporary expedient, as the metric system is likely to be adopted in the near future on commercial considerations.

In the preliminary notices it is stated that 15° C. has been adopted as the temperature for ascertaining the solubility of substances in liquids and taking specific gravities, unless otherwise stated, and also for conducting volumetric operations. Elsewhere in the book it is assumed that 25° C. is the temperature of the shop. If this be the usual shop temperature in the United States—it is sometimes difficult here to raise it to 10° C.—it furnishes a strong argument for the adoption of a higher temperature for the above purposes, and the better to adapt the British Pharmacopœia to the requirements of the different parts of the empire two different degrees of temperature might be adopted; one, say 15° C., for home use, and to keep in touch with the prevailing usage in other countries and another, say 20° C., or even 25° C., for the benefit of those whose lot is cast in the warmer regions of the empire, so that they might test the various articles under the most favourable circumstances. Solubilities are more definitely stated than in the B.P., and this practice might be followed with advantage. The statement of the molecular weight of a substance, as well as its chemical formula, is also another great convenience.

The insertion after a test of the name of the impurity which it is employed to detect is a noteworthy feature of the book under review, and one likely to commend itself to graduates as well as undergraduates. While all might be able to say what barium chloride or silver nitrate was employed to detect, how many even of the former class would be able to say offhand what impurity was indicated by the production of a precipitate on boiling a mixture of one volume of strong solution of perchloride of iron and forty volumes of water, or by the production of a green or blue tint on the addition of a drop of fuming nitric acid to a mixture of 2 C.c. of benzol and ·5 C.c. of sulphuric acid?

Throughout the book there are directions given as to the storing of various chemicals, which are particularly useful as reminders on small but important points which are frequently overlooked. The notes having reference to indications of quality, which are attached to various important drugs, such as ergot, are useful in like manner.

The mode of preparing acetum scillæ is not an improvement, for by using the squill in No. 30 powder a glairy liquid is obtained which it is difficult to filter bright, and the presence of such a large proportion of mucilaginous matter will not enhance its keeping properties. Its strength will also depend much on the care with which the contents of the strainer are washed.

An error has been made in stating the solubility of boric acid in glycerin as one in ten, the B.P. being more correct in giving it as one in five.

Diluted mineral acids, all of which contain 10 per cent. of real acid, are, when made by reducing a stronger acid, directed to be prepared by weight, a method preferable to that of diluting by measure, as there is no necessity for waiting till the mixture has cooled to the proper temperature in order to adjust the bulk.

Tartaric acid must not sustain any sensible loss on heating for some time at 100° C., and must respond to a somewhat more stringent volumetric test than the B.P. demands. Such an acid ought to meet the requirements of the addendum for seidlitz powder.

There are four degrees of strength of alcohol official, and several others are employed. There seems little reason for retaining the official diluted alcohol, and the necessity for two strengths so close as alcohol and deodorised alcohol is not very apparent. It would be better to have one high standard alcohol, apart from the absolute, with a statement appended showing how to reduce it to any required strength, and the various dilutions could be described in the formulæ into which they enter, according to their percentage strength. Alcohol and diluted alcohol differ considerably from our rectified spirit and proof spirit, being respectively 65° o.p. and nearly 15° u.p., compared with 56° o.p. and proof, and this has to be borne in mind when comparing similar preparations into which they enter.

The influence of the practical pharmacist is observable in the manipulative details of the processes for making the cerates and ointments. Thus, resin cerate is to be made without stirring till cold, chrysarobin and iodoform ointments by rubbing the ingredients together, and zinc ointment is to have the oxide sifted on to the melted lard and stirred. Superior preparations are produced by following these directions. Nitrate of mercury ointment is prepared by acting on lard oil with a portion of the nitric acid, and when cold adding the solution of nitrate of mercury; this method may ensure the better keeping of this ointment. It is a noticeable fact that there are no ointments ordered to be made with paraffin basis.

The definition of what chrysarobin is is clear, and might be copied entire.

Three varieties of cinnamon are recognised. Cassia, which is employed in making compound tinctures, probably in accordance with trade custom; Ceylon, which is used to prepare the tincture and compound powder, and Saigon, which does not enter into the composition of any preparation. All of them presumably can be sold as cinnamon.

A general formula is given for making decoctions, followed by special formulæ for exceptional drugs; this practice might be followed. The same plan has been adopted for infusions, but is less happy in its conception, as no allowance is made for modifying the formula when dealing with such drugs as calumba, with which the use of boiling water is inadmissible.

It is unfortunate that the committee found it inconvenient to give general forms of directions for the preparation of extracts and tinctures—drugs requiring special treatment being dealt with as in the case of decoctions and infusions—as otherwise much space, as well as wearisome reiteration of the same phrases, would have been saved. That much work has been done in the United States in connection with the preparation of extracts and tinctures is undoubted; but surely the adaptation of menstruum to drug has been carried to excess, when we find some twenty-four different strengths of alcohol—many of which differ little from each other—employed for extraction. A lesser number might suffice, and yet serve every practical purpose. It seems also somewhat erratic that two or three different strengths should be employed for the extraction of the same drug. All cannot be the most suitable menstruum. In the preparation of extracts there is another curious point; thus, in some instances, the alcohol is directed to be distilled off from the portion to be evaporated; and in other instances, and this sometimes with the same drug, no such instruction is given.

The direction to reduce soft extracts to a pilular consistence is more definite than the corresponding phrase in the British Pharmacopœia, which seems to be variously interpreted; but greater uniformity might be ensured by directing that the finished extract should contain a certain percentage of dry extract, as ascertained by exposing a portion to a temperature of 100° C. till constant in weight. To keep extracts plastic 10 per cent. of glycerin is allowed to be added, and the extracts so treated are therefore so much weaker; while those specially named—gentian and taraxacum—are not, as a rule, those that require the addition. It would be better, in cases where extracts are apt to get dry, to order a percentage of glycerin—probably 5 per cent. would suffice—to be added before they are brought to their final bulk.

In the preparation of tinctures a modified form of percolation would be preferable to the continuous process adopted, as this can be conducted economically only on the large scale, where it pays the manufacturer to recover the alcohol left in the marc. Compound tincture of benzoin is prepared in two hours by digesting at a temperature not exceeding 65° C., but seven days are required for the making of the simple tincture! The mode of preparing tincture of quillaia has already been commented upon in this place, and shown not to be the best, if the object be to obtain the largest yield of saponin unaltered.

Ammonia and camphor liniments are made with cotton-seed oil, which beyond being cheaper and a home product possesses no advantage over olive oil. Liniment of lime is the original carron oil, being made with linseed oil. An expeditious process is introduced for making soap liniment which contains less soap than the B.P. formula, the amount in which is excessive.

The use of a gentle heat is directed in the making of oleate of mercury. This is an improvement on our method, which is exceedingly tedious.

The alteration in the proportion of the various ingredients of compound liquorice powder is an instance of how not to do it; the simple relationship which exists in the powder as originally made has been destroyed, and one less easily remembered substituted.

The process for making resin of scammony by reducing the alcoholic extract of the root to a syrupy consistence and then pouring it gradually into a large bulk of water kept vigorously stirred is one that if carefully carried out ought to ensure a product wholly soluble in ether, which that obtainable in Britain rarely, if ever, is, owing apparently to defective washing.

Spirit of nitrous ether is directed to be determined by a gasometric test, which is detailed, instead of a reference being made to a perhaps inaccessible book, as in our pharmacopœia. Aromatic spirit of ammonia is prepared without distillation, the product being equally good, the only difference being that it gradually acquires a yellowish tint. Spirit of chloroform is made of a strength of 6 per cent., apparently for the mere sake of a change, the other spirits being about equally divided between 5 per cent. and 10 per cent. Whisky and brandy are both official, and are to be tested for purity and strength, so that patients may have their prescriptions for these medicines dispensed with genuine drugs. No formulæ are given for any of their preparations.

Sugar in crystals is the kind recognised, and rightly so, as some of the best makes in the market are in this form. It is required to be free from blue colouring matters, and practically so from glucose or invert sugar.

Percolation has been introduced as an alternative method for making some syrups, and by this means beautiful products can be made with the minimum of attention, though a longer time is required than when heat is used. The mode of working by stuffing a piece of sponge into the neck of a percolator or funnel is, however, only applicable when there is little fæcal matter to clog the filter. In other cases it is better to have the filtering medium in a separate piece of apparatus, attached to the percolator by means of a piece of india-rubber tubing, furnished with a clamp, so that the flow of liquid can be stopped, and the sponge taken out and cleansed when it gets clogged. A bottomless phial with a perforated cork and glass tube inserted in the wider end serves the purpose very well.

For preparing syrup of iodide of iron, the iron is ordered in reasonable quantity, and this, together with the provision for washing the flask and filter, insures a smaller loss of active ingredient than when the B.P. process is followed. It is much stronger than our syrup. In making syrup of tolu, alcohol and precipitated phosphate of lime are ordered, but they are not necessary, as a good and bright syrup can be made by triturating the balsam and a portion of the sugar to a moderately fine powder, digesting this in the proper quantity of cold water till the sugar is dissolved, filtering, washing the filter with water to make up bulk, and making a syrup with the remainder of the sugar by percolation.

White and red wines are official, those of native production being recommended for use unless otherwise ordered. Specific gravities and some useful tests are given, as well as percentage of alcohol, for estimating which a handy method is described. All medicated wines are made with white wine and fortified with 15 per cent. of official alcohol, thus adding to their keeping properties. In making antimonial wine the tartarated antimony is dissolved in boiling water before being added to the wine, an old-fashioned but sensible procedure.

In addition to a long and elaborate list of reagents and test solutions, there are short articles on determination processes, together with many useful tables, and though we are accustomed to look elsewhere for many of these and some other things which are to be found in the volume, still it is exceedingly handy to have them bound up with the pharmacopœia.

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The next communication was—

## Notes on Some Preparations of the United States Pharmacopœia.

BY GEORGE LUNAN.

I have selected four preparations contained in the United States Pharmacopœia which I think might with advantage be added to the British Pharmacopœia to be published shortly, and purpose laying my experience of the manufacture of them shortly before you, so that opinions may be elicited as to the suitability of their inclusion, and the form in which they should be added.

There may not be a concensus of opinion as to their addition, but they have struck me as required by the great demand they already have with us. They are discussed without regard to other literature on the same subjects than the United States Pharmacopœia.

### *Acidum Hypophosphorosum Dilutum.*

This preparation, containing 10 per cent. $HPH_2O_2$, sp. gr. 1·046, is introduced without directions for manufacture, but elaborate tests are added to ensure purity. I think the B.P.C. formula should be included in the new Pharmacopœia, containing 30 per cent. of acid, sp. gr. 1·1367. The stronger acid has great advantages, and for the various purposes for which it is now frequently required is more convenient. The only objection to the B.P.C. formula is the high price of the barium salt, but it has been shown to be useless to attempt to prepare a pure acid from the lime salt.

### *Caffeina Citrata Effervescens.*

The formula for this is practically two-thirds undecomposed tartrate of sodium, one-third sugar, and one grain citrated caffeine in each fifty grains of the product.

The *modus operandi* is to moisten the ingredients with alcohol, a new official departure, and pass through a granulating sieve then dry. The alcohol is necessary from the absence of sufficient citric acid containing water of crystallisation to produce a pasty mass when heated as in ordinary granulation. The process works well, as the sample on the table shows.

If an effervescent caffeine be introduced into the new pharmacopœia I hope this formula will not be copied. The product is too sweet; indeed, I do not see the necessity of sugar in any of these medicated effervescent preparations. If the patient desires it, the sugar or syrup can be added before the granules. Besides, it takes away from the effervescence.

I am glad to note that two of the three effervescent preparations contained in the B.P. additions of 1890 contain no sugar. The dose of caffeine is too small also, for in order to get the B.P. maximum dose—five grains—a fair aperient dose of tartrate of soda would be taken. Two grains of caffeine to each teaspoonful (ʒi) is nearer the strength prescribed in this country.

There is no advantage as far as I know in excluding the citric acid except price, and a formula constructed on the usual citro-tartrate of soda basis without sugar, and with two grains of citrate of caffeine in each drachm and granulated in the usual way, would be more suitable and likely to supersede present unofficial preparations so largely used in this country.

### *Glyceritum Boroglycerini.*

Briefly the formula of the U.S. Pharmacopœia is to take five times the molecular weight of glycerin, and after raising its temperature to 150° C., to add five times the molecular weight of boric acid and continue heat until the weight of the product is equal in grammes to five times the weight of the molecule of glyceryl borate, and adding an equal quantity of glycerin to this product. The equation being—

$$C_3H_5(HO)_3 + H_3BO_3 = C_3H_5BO_3 + 3H_2O.$$

The result is a perfectly satisfactory product already familiar to us, containing one part of glyceryl borate and one of glycerin.

The only criticism I would offer on this preparation, is that the addition of the glycerin by volume making a quarter more would reduce its viscosity, and render it on the whole more suitable for all purposes. It was suggested, I think, by Mr. C. F. Hendry in our last discussion on "Possible Additions to the new B.P." to include glycerinum acidi borici, and it is brought forward more for the purpose of eliciting opinion as to its inclusion than to criticise it. In my experience, it is called for ten times oftener than glycerinum boracis, although I do not argue that on that account the latter should be excluded.

### *Lithii Citras Effervescens.*

This is simply a lithiated saline, containing rather less than two-thirds undecomposed citrate of sodium, rather less than one-third sugar, with four and one-fifth grains of carbonate of lithium in each drachm. The solution formed after decomposition is slightly acid, and theoretically this is intended, calculating with atomic weights carried to two decimal places.

Altogether it is no doubt a very satisfactory preparation, as the others I have enumerated, for American requirements, but not at all suitable as a successor to what we in this country have been accustomed to dispense.

Again, I do not see the necessity for sugar in this preparation—less so than in the effervescent caffeine—but it is well known that Americans take all their medicines sweeter than is done in this country. The sugar reduces the effervescence, and should be specially objectionable to the class of patients for whom lithium salts are prescribed.

As to substituting the carbonate for the immediate production of citrate, I am of opinion that this is a decided improvement, both economically and therapeutically. But unless the preparation is well stirred a little of the lithium salt—mainly decomposed after the sodium bicarbonate—remains in the bottom of the glass. This is probably the reason why this effervescent preparation is not to be granulated, the reaction being more rapid than from granules. Still, I doubt very much if the loss of lithium salt—probably about 5 per cent.—would be greater from granules made without sugar, because if taken at the height of effervescence the draught will contain all the lithium suspended by the intensity of the reaction or decomposed. This saline, being dry and powdery, requires to be mixed mechanically, otherwise it lies on the top of the water, and even when so mixed lacks the effervescence and go of the former.

A preparation with five grains of citrate of lithium in each drachm is in frequent demand in this country, and for dispensing is our only standard—this saline contains sufficient carbonate to produce rather over eleven grains of citrate of lithium B.P. (with four molecules of water of crystallisation) in each drachm, only, however, equal to about eight grains U.S.P. itrate, which is anhydrous.

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The next communication was on—

## The United States and British Pharmacopœial Assay Processes compared, and other Notes.

BY GEORGE COULL, B.SC.

The most one can do at this early stage of the book's existence (it being legally just two months old) is to make some observations of a general character, and give one's experience with regard to any of the preparations, or the processes of manufacture of these, or the numerous tests for the purity of its products, with which the book is adorned, or to note any little point that seems worthy of remark. In fact, it will take a good many evenings before the subject of the U.S.P., 1890, is thoroughly threshed out.

It appears to me that, taken as a whole, the work is a most praiseworthy compilation. The Americans in theoretical pharmacy lead the way, and are the first to avail themselves of the vast amount of scientific material which has been accumulating since their last issue. Now that the General Medical Council has appointed an annual reporter on the pharmacopœia, it is to be hoped that in future we will not be behind them in this respect.

It is a model pharmacopœia (though not a perfect one by any means, as some of my pharmaceutical friends term it), and specially so in reference to the numerous little items of information it contains, which assist in clearing away a doubt and make the meaning of the compilers so plain that, to use a common expression, their intentions are clear to the meanest intellect. For example, under "Reagents," p. 463, there will be found the first official definition of that little word "about," which has called forth so many ironical remarks and digs at the editor of the British Pharmacopœia by the very people the intentional elasticity of the word was meant to benefit. It has kept the chemist and druggist many a time, I have no doubt, out of the clutches of the public analyst, especially the youthful one inexperienced in drugs. We have heard of him from the legal reports in the journals. There "about 25 C.c. is to be interpreted as standing for from 24·5 to 25·5 C.c., the allowable variation in such cases being 2 per cent. either way. In the text of the pharmacopœia this is expressed by saying 'about 25 C.c.,' or 'about 16 per cent. of iron,' etc."

We cannot but admire the caution with which the committee has been actuated in refusing to introduce general methods of assay or any applicable to special drugs that have not yet been thoroughly worked out. As in the British Pharmacopœia, cinchona, nux vomica, and opium are the only drugs that are supposed to be susceptible of accurate standardisation, nux vomica being now added.

The assaying of opium must be done by the method in the pharmacopœia; in the B.P. one is allowed to use the method given, or any trustworthy method. In this respect the Americans have the advantage in having a process given them which they are to adhere to; with us, who is going to give an *ex cathedrâ* opinion on what are trustworthy methods and what are not? It is well-known that even the same process for the assay of a drug gives different results with different operators, unless the conditions to the very slightest are absolutely the same; how much more then will different processes with different chemists?

While assaying some opium preparations lately for the purpose of standardising them, I took occasion to compare the results as obtained by the B.P. and U.S.P. processes. These results are now given, being considered to be of general interest. One fault the

U.S.P. assay processes have is their prodigality of material; for instance, to determine the morphine in tincture of opium, the directions are to take 100 C.c. (about 3½ fluid ounces) when 20 or 25 C.c. would do equally well. The process now adopted is a modification of that known as Teschemacher and Smith's. This was originally devised by Prollius, modified by Flückiger, improved by Squibb, and further modified by Stillwell.*

The points of difference in the U.S.P. modification are:—Cold water is used to exhaust the opium in place of warm, as a cleaner solution is claimed to be obtained; the solution is concentrated to a definite weight, instead of to a thin syrup; the alcohol added to the concentrated solution of the opium is increased to nearly five times the quantity; the ethereal layer is separated and the aqueous solution washed with other two separate portions of ether and then filtered, instead of the whole contents of the flask being filtered together.

In the U.S.P. process, the crystals on the filter are now to be washed drop by drop with water till practically free from mother liquor, and afterwards drop by drop with morphiated alcohol; the alcohol is then displaced by ether, the crystals dried at a temperature not exceeding 60° C. until constant, transferred to a tared watch-glass and weighed.

In Teschemacher and Smith's process, which is rather more complicated, the crystals are washed with morphiated spirit till it passes colourless, and then with morphiated water till it also passes colourless, then dried at 100° C., transferred to a mortar, powdered, digested in benzene, filtered through vacuum filter, washed with benzene, dried, weighed, and titrated with standard hydrochloric acid and litmus.

The instructions in the U.S.P. are very definite. You are told how much water to use to exhaust the opium, how long it is to be macerated, what weight the solution is to be evaporated to, the size of filter to use, and so on; all this tends to uniformity of results. The separation of the ethereal layer and washing of the aqueous solution with more ether to remove the narcotine, saves the time employed in drying the crystals, powdering, digesting in and washing with benzene, as in the Teschemacher and Smith process. These, I venture to think, are improvements; but, on the other hand, one wonders why the alcohol has been increased to such an extent (corresponding practically to the quantity in the B.P. process), when the solubility of morphine in alcohol is carefully compensated for by washing the crystals with morphiated spirit, and why the crystals are to be transferred to a tared watch-glass and weighed instead of being weighed on a tared or counterpoised filter, and also why titration of the crystals is omitted, a most important point.

It is to be particularly noted that the morphine obtained by drying at 100° C., as the B.P. directs, is anhydrous morphine, while that got by drying at a temperature not exceeding 60° C. is crystallised morphine with one molecule of water.

Teschemacher and Smith's process is considered by Allen and Dott probably the best hitherto published. To my mind a grave objection to the adoption of the U.S.P. modification as one applicable to the retail chemist, or in fact any chemist, or as suitable for an exercise at examinations, is the length of time it takes. The B.P. method is said to yield low results, but if the editor of the pharmacopœia determines once for all the loss occasioned by proceeding in a definitely predetermined manner, and that loss allowed for, it might be as well to retain the process on account of the expedition with which it can be conducted, unless a speedier modification of Teschemacher and Smith's can be devised. I thoroughly agree with Mr. Dott* that the B.P. process has a good deal to recommend it, and that one is perfectly justified in making allowance for a certain constant loss. He pointed out that this had the approval of Fresenius in the determination of magnesium. I may add the same principle had the sanction of the compilers of the U.S.P., 1880; in the assay of cinchona for quinine there was a certain percentage of quinine to be added to allow for the solubility of the alkaloid during washing.

A sample of powdered opium and one of tincture of opium were estimated by the B.P. and U.S.P. processes, with the following results:—

| | Morphine per cent. B.P. | Morphine per cent. U.S.P. |
|---|---|---|
| Powdered opium | 12·4 | 12·93 |
| Tincture of opium (1) | 0·806 | 0·936 |
| Tincture of opium (2) | 0·804 | 0·948 |
| Tincture of opium (mean) | 0·805 | 0·942 |

Powdered opium U.S.P., 1880, contained from 12 to 16 per cent., now it is to contain from 13 to 15 per cent. of crystallised morphine, with one molecule of water. The standard for moist opium in its natural state is unchanged, being at least 9 per cent. Tincture of opium in the last Pharmacopœia was to contain about 1·25 per cent. morphine, and now it is to contain in 100 C.c. from 1·3 to 1·5 grammes morphine.

The assay of the tincture was exceptionally tedious. On evaporating 100 C.c. to 20 C.c. and adding 40 C.c. water the resin separates out. This is to be filtered and washed with water until all soluble matters are extracted. The morphine, it seems to me, gets entangled with the resin, and although washed with nearly 400 C.c. of water the washings on acidification still gave a precipitate with Mayer's reagent. 400 C.c. is rather a large quantity of water to be evaporated on the water-bath during an assay process for every-day use.

Methods of assay, in which a certain amount of drug is to be thoroughly exhausted and the alkaloid determined in the whole amount used, as a rule take longer time, and require more attention than processes in which a known weight of drug is digested with a known volume of solvent, in quantity known to be sufficient to dissolve all the alkaloid present, and an aliquot portion of the solution taken to determine the amount of alkaloid. The U.S.P. authorities have departed from this opinion as regards opium assay, but have adopted it in their new process for cinchona assay.

This process consists in macerating 20 grammes of cinchona bark in fine powder in 200 C.c. of a mixture of 19 volumes of alcohol, 5 volumes of chloroform, and 1 volume of ammonia water for four hours, with frequent and thorough agitation, filtering 100 C.c. through cotton wool and determining the alkaloid in this, equal to 10 grammes of bark. This is somewhat similar to the method of the German Pharmacopœia; the solvent there employed is a mixture of 85 parts of ether (·724–·728), 10 parts of alcohol (·830–·834), and 5 parts of ammonia water (·960), all by weight. According to the published solubilities of the various alkaloids, the U.S.P. method may be supposed to make a more thorough extraction. In both cases the solution is evaporated to dryness, the residue of crude alkaloids dissolved in hydrochloric acid and water in the German, and sulphuric acid and water in the United States Pharmacopœia, the solution filtered and the filter washed; the acid solution of alkaloids is then made alkaline with caustic soda, and repeatedly extracted with chloroform, the chloroformic solution evaporated, the residue dried at 100°, and weighed as total alkaloids. A process is also given for the approximate determination of quinine by decanting and filtering another 50 C.c. of the solution of the alkaloids. In two attempts I got 43 C.c. and 38 C.c. respectively; if 50 C.c. is really wanted, the amount of solvent will have to be increased; or a preferable plan would be to redissolve the residue of total alkaloid, and estimate the quinine in it. The objection I have to the use of chloroform for shaking out is the formation of an almost inseparable emulsion, which takes a considerable time to separate. Gently heating the separator by placing it in the funnel-hole of a water-bath, instead of cooling, as recommended by some, greatly assists the separation. If benzolated amylic alcohol does not extract anything besides the alkaloid, it makes a more convenient solvent for shaking out than chloroform. The extraction after two separations is practically complete, and the line of demarcation between the fluids is very clear and well-defined. Even after four extractions with chloroform there is some alkaloid retained by the aqueous solution, and the difficulty of separating the chloroformic layer and the aqueous solution increases with the separations.

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* Allen's 'Organic Analysis,' vol. iii., part ii., p. 348.

* *Pharmaceutical Journal*, [3], xix., 82.

In the examination of cinchona bark for quinine, the alkaloid is to be dried at 100° C. and calculated as quinine monohydrate. Quinine left on evaporating an ethereal solution at 100° C. has approximately this composition, but a more accurate mode of procedure would be to dry at 120° C. and calculate as anhydrous quinine, at this temperature quinine rapidly becomes anhydrous.* This attempt at accuracy is an improvement on the B.P. process for the determination of quinine in citrate of iron and quinine, where the directions are to dry the ethereal residue, without giving any information regarding the temperature to be employed or the composition of the product obtained.

With regard to the assay of nux vomica I have little to say, save that I think the titration of the alkaloidal residue is an advance on our process of determination. A sample of tincture was determined by the B.P. process, and gave 1·05 grain per fluid ounce, and on titrating as the U.S.P. directs, the result, as may be imagined, came out slightly lower, ·926. The total alkaloid is calculated on the assumption that the strychnine and brucine are present in equal proportions. This they have practically been found to be, any great variation being uncommon. There is no doubt the process is more accurate than that of the B.P. Brazil wood indicator gives a particularly sharp end reaction.

It is to be observed that the extracts of opium and nux vomica are now dried and powdered. The formula for powdered extract of opium is new; it is to contain 18 per cent. of crystallised morphine, equivalent to about 17 per cent. of anhydrous morphine, a strength sometimes attained by powdered opium. In the case of powdered extract of nux vomica we have the old form for the abstract restored, with the addition of a definite alkaloidal standard; the extract is to contain 15 per cent. of total alkaloids.

The way in which the oily matter in the nux vomica is got rid of is ingenious and worth reproducing—one kilogramme of nux vomica in No. 60 powder is to be practically exhausted with a mixture of 3 parts of alcohol and 1 part of water, the spirit distilled off and the extract evaporated to 150 grammes. This is transferred to a bottle and extracted several times with ether till a few drops of the ethereal layer no longer impart a permanent, greasy stain to filter paper. The ether is recovered and the oily residue extracted with boiling water, acidulated with acetic acid, to recover any alkaloid dissolved by the ether, I presume, and the aqueous solution added to the main quantity of extract. This is then examined for total alkaloid and water, and by calculation the amount is obtained of well-dried sugar of milk required to be added to the extract, so that the dried extract will contain 15 per cent. total alkaloid. The mass is then evaporated to dryness and powdered. This plan will, no doubt, greatly conduce towards uniformity in the extract; the B.P. article sometimes loses by evaporation, and at others gains in weight, through absorbing moisture, as pointed out by several observers.

Extractum Cinchonæ Fluidum.—In the 1880 pharmacopœia there were three descriptions of cinchona bark, namely, *Cinchona*, *Cinchona flava* and *Cinchona rubra*; there are now two, the yellow being omitted as a special article of the pharmacopœia, though still included under cinchona.

Formerly cinchona was defined as the bark of any species of cinchona containing at least 3 per cent. of total alkaloids; now it is the bark of *C. calisaya*, *C. officinalis*, and hybrids of these and of other species of cinchona yielding not less than 5 per cent. of total alkaloids, and at least 2·5 per cent. of quinine. A pint of the fluid extract was prepared according to the U.S.P. process. It was found necessary to use 55 fluid ounces of menstruum before the liquid ceased to precipitate with caustic soda, and even then on acidifying it still precipitated with alkaloidal reagents. The yellow bark used when assayed by the U.S.P. method was found to contain 3·8 per cent. total alkaloids, and the marc yielded ·87 per cent. The finished extract was assayed for total alkaloid by the B.P. process, which simply consists in making the extract alkaline and shaking out with benzolated amylic alcohol; the yield was 4·2 per cent., being an increase on the quantity originally present in the bark.

This is a weak point in the determination of our liquid extract. The residue of crude alkaloids should be dissolved in acid, filtered, and again shaken out with the solvent. The residue in the U.S. P. determination of the bark is almost white, not brown, as in the *B.P.* The U.S P. extract is not standardised, and in that respect we are before them, although we could have a more refined process.

The extract (sample shown) looks very nice. It is rather thick, owing to the glycerin and extractive in it. It is not such an elegant preparation (as these things go) as the B.P. article, in that it does not mix bright with water. It may be advanced, as it sometimes is in analogous cases, that starting with a standardised bark and subjecting it to the same treatment, the resulting fluid extract ought always to be the same. It is hardly necessary to say that unless the greatest care be taken, and the process be thoroughly and carefully conducted in making liquid extracts, the products are not always of the same strength. I think the B.P. article is fully the better, and we need not imitate this preparation.

To summarise:—If the loss of morphine in the B.P. process for determining opium be allowed for, and the resulting morphine titrated, it is still the most convenient process for ordinary use. The cinchona assay is much improved, and our process for the liquid extract would be improved if the crude alkaloids from the benzolated amylic alcohol were dissolved in acidulated water, filtered, made alkaline, and again extracted with benzolated amylic alcohol or chloroform. The nux vomica assay, on account of the titration of the crude alkaloid, is a material advance on the B.P. method.

There are several preparations the formulæ for which we might adopt as improvements on our own; among these is syrup of rose. They add 125 C.c. of fluid extract of rose to 875 C.c. of syrup, that is, the familiar one to seven. Without adding a fluid extract of rose to the pharmacopœia, a preparation somewhat on the following lines is suggested:—

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* *Pharm. Journ.*, [3], xvi., 385, 897, 937.

Take of—

| | |
|---|---|
| Dried red rose petals, in No. 20 powder | 2 ounces. |
| Glycerin | 1 fluid ounce. |
| Rectified spirit | 3 fluid ounces. |
| Distilled water | 3 fluid ounces. |

Mix the fluids, moisten the petals with the mixture, and percolate slowly, using distilled water to chase out the menstruum until seven fluid ounces are obtained. This is to be added to 28 fluid ounces of syrup and well mixed.

Prepared as above, the syrup keeps its colour well, the tannin is kept in solution by the glycerin, and there is no fermentation, owing to the absence of those substances taken out by hot water. I have here a sample of this syrup, and one made by the B.P. process.

On the other hand, the formula for glycerin suppositories makes a suppository that begins to sweat within a few minutes of being taken out of the mould. They are ordered to be wrapped in tinfoil at once, and are directed to be freshly prepared when required. If a suppository is wanted acting more quickly than the B.P. one, perhaps Mr. Boa's suggestion about the effect of adding a trace of boric acid will be considered.

The B.P. glycerin suppository is a very good one, and I have never had any complaints regarding their action.

*Chloroform.*—During the discussion on the tests for chloroform at the last evening meeting here, I observe that Mr. Hill suggested the inclusion in the Pharmacopœia of two varieties of chloroform, one absolutely pure for anæsthic purposes, the other not so fully purified for making liniments, etc., with. Mr. D. Brown has also proposed something like this if I remember aright. In the U.S.P. 1880 there were two chloroforms, choroformum purificatum and chloroformum venale; the latter is now dismissed, and the former is simply called chloroform. There must be some good reason for having only one quality after having had experience of two qualities.

It seems to me that this will require careful consideration, and it may eventually be found safer to retain only one quality, namely, the purest that can be made.

A decided acquisition is the inclusion among the tests of the purpose of the tests, what it is meant to do, namely, to prevent the presence of any substance which should not be there, to mark the limit of a harmless impurity, or to distinguish it from some substance liable to be confounded with it, in each case stating the name of the substance to be detected. Professor Attfield leaves the adoption of this open for future consideration. It would undoubtedly be a great boon, not merely to the student reading for his examinations, but also to the retail pharmacist and all those whose business it is to examine pharmacopœial substances.

The tests for chemicals are most complete, every conceivable impurity being guarded against, or its limit stated. This from a cursory look. Potassium bitartrate has been raised to 99 per cent., but direct titration of the salt has not been adopted in its determination. It is a question whether tartrate of calcium, if present, is not partially converted into calcium oxide, just as calcium oxalate is when ignited, unless it is carefully watched and the temperature regulated, and hence there might be some of the standard acid used up by this lime, and so increase the apparent percentage of bitartrate.

The portion of the pharmacopœia, "Reagents and Tables," has been very fully and thoroughly revised, and will be found extremely useful.

The great increase of volumetric methods is another feature of the book. This renders the testing of chemicals much easier to the pharmacist.

No doubt the processes will receive their due share of criticism in course of time.

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Mr. Dott said, in a letter which was read, "As regards opium assay, it is pretty certain that the present B.P. method will be superseded, either by the method of Teschemacher and Smith, or by some modification thereof, such as I described recently (*Pharm. Journ.*, [3], vol. xxii., p. 746). I intend to describe another method, which is, in some respects, preferable and more expeditious, founded on precipitation by barium chloride."

The Chairman said the hour was now so late that it would probably be best to adjourn any further discussion to a future meeting. This was agreed to and, on the motion of the Chairman, a cordial vote of thanks was awarded to the authors of papers.

The Assistant Secretary drew attention to a sample of scammony sent by Mr. Melvin, of James Robertson and Co. It was completely riddled by a small reddish-brown coleopterous insect, which was present in large numbers. The sample was poor in resin, and contained a large quantity of starch. He also drew attention to the seeds of *Carica papaya* sent by Mr. J. S. Liversidge, and samples of closed, half-closed, and open flowers of *Pyrethrum cinerariæfolium* sent by Messrs. Hodgkinsons, Treacher, and Clark, London. The recent additions to the Library were also referred to.

On the motion of the Chairman, a cordial vote of thanks was awarded to the donors, and the meeting then closed.

# Provincial Transactions.

## LIVERPOOL CHEMISTS' ASSOCIATION.

The annual dinner of the Liverpool Chemists' Association took place on Wednesday, March 7, at the Adelphi Hotel, the President of the Association, Mr. J. J. Smith, presiding over a numerous company. Among those present were the Lord Mayor, the Right Hon. W. B. Bowring, Mr. Percy Boulnois (President of the Liverpool Engineering Society), Mr. G. S. Woolley (President of the Manchester Pharmaceutical Association), Professor Carter, Drs. Nevins, Hawkins-Ambler, O'Flaherty, W. Glover Moore, A. C. Wilson, and E. W. Barnes, Messrs. Edward Evans, jun., J. M. Buck, Peete, and J. Woodcock, Messrs. J. Bain and M. Conroy (Vice-Presidents of the Association), R. Parkinson (Hon. Treasurer), A. S. Buck and J. Smith (Hon. Secretaries), T. F. Abraham, R. C. Cowley, E. Davies, H. O. Dutton, J. Hocken, W. H. Leatham, C. Symes, T. H. Wardleworth, W. Wellings, and T. S. Wokes (members of the Committee).

Mr. Symes, proposing the toast of the "Liverpool Chemists' Association," said the Association had now enjoyed an existence of nearly fifty years, and during the early part of its career it was the only body representing scientific chemistry in Liverpool or neighbourhood. But in recent years the Society of Chemical Industry had established a branch in Liverpool, and no doubt the fact was that they had got a number of papers on chemical technology read at the University College which the Chemical Association would otherwise have had at the Royal Institution. He could assure them that the Association not only provided for the higher culture of its members and the training of its students, but also for the more everyday interests of those engaged in the business and calling of pharmacy.

Mr. M. Conroy, in responding to the toast, said he could tell them as an old member that the Association deserved well at their hands. It had existed nearly half a century, and had been self-relying and independent all the time. Pharmaceutically they had held their own, and would continue to do so, and the papers which had been read at meetings of the Association had made their mark upon the British Pharmacopœia of to-day. They had done useful work in the past, and would do more useful work in the future.

The Chairman submitted the toast of "The Town and Trade of Liverpool," and

The Lord Mayor, in acknowledging the toast, said he wished to express publicly the recognition he felt was due to them for the great work chemists did in their midst.

The toast of "Medicine and Pharmacy" was submitted by Mr. Edward Evans, jun., and responded to by Professor Carter, Dr. Nevins, and Mr. T. F. Abraham. The toast of "Our Guests and Musical Friends" was also honoured. In the course of the evening a number of quartettes were very well rendered by Messrs. D. Davies, E. Edwards, J. Heginbotham, and Eaton Batty, each of whom also contributed individual songs. Songs were further given by Mr. Frank L. Joseph and Mr. E. Morrison, Mr. John H. Houlgrave presiding at the piano.

## Scottish Transactions.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on Thursday, March 1, a lecture on the "Anatomy of the Respiratory Organs" was delivered by Mr. J. Rankin, B.Sc., of the Zoological Laboratory, Glasgow University. The lecture was illustrated with a series of beautiful plates, exhibited by oxyhydrogen light, and demonstrated the means nature adopted to supply oxygen to the animal kingdom wherever it was needed to sustain life. Beginning with the Protozoa the lecturer showed the gradual progression in the scale of living forms, and the modifications and adaptations for breathing in different media, ending with the developments of the lungs in higher animals. The lecture was greatly appreciated, conveying as it did, in the most easy and enjoyable way, the highest scientific teaching, and showing the beauty of evolution as it is practicably applied. A hearty vote of thanks was accorded Mr. Rankin on the motion of Mr. Alexander Boyd.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACTS

#### Sale of Laudanum by an Unregistered Person at Hull.

At the Hull County Court on Thursday, March 8, his Honour Judge Bedwell had before him the action of the Council of the Pharmaceutical Society *v.* Hayton, in which the plaintiffs sued for a penalty of £5 in respect of an illegal sale of poison.

Mr. T. R. Grey appeared for the plaintiffs, and Mr. Singleton for the defendant.

Mr. Grey, in opening the case, said that his Honour tried the facts against the same defendant on December 6, and then gave judgment for the plaintiffs. It appeared that the defendant had a summons served on him on November 10, and the return day on the summons, owing to a clerical error of the court, was November 6. As it was served three days after the possible date, it must have been meant December instead of November. What did the defendant do? He did absolutely nothing until a notice was served to him for taxation of the costs.

His Honour: I feel that as a certain technical injustice has been done I must hear the case again. I will deal with the question of costs at a later stage of the proceedings.

Mr. Grey: Very well, your Honour. This is an action for a penalty of £5. The defendant was the proprietor of a business at 117, Wincomlee, Hull; but I believe now he is, and was at the time of the purchase, more of an assistant than proprietor of a business. The business was called Hayton's Drug Stores, but at the date of the purchase the name over the shop was Farrah's Drug Stores, and inside was still the name of Hayton. On September 11 last the defendant sold half-an-ounce of laudanum, which is a preparation of opium. The bottle bore a label with the word "Poison; from Hayton's Drug Stores," and giving the address. These proceedings were taken under the Act 31 & 32 Vic., c. 121 and the object of the Act was to prevent the danger assumed to arise to the public by absolutely excluding all persons other than those who have passed the examinations under the Pharmacy Act entitling persons to sell poisons. The case which governs this case is the case of the Pharmaceutical Society *v.* Wheeldon.

*Evidence for the Plaintiffs.*

Jonathan Mitchinson, living at Hull, deposed that on September 1 last, he went to the drug stores at 117, Wincomlee, Hull. He entered and purchased twopennyworth of laudanum and twopennyworth of soap liniment. Mr. Hayton served him, and the laudanum was put into a bottle. The two were mixed together; the label "poison" was put on by Mr. Hayton. He paid fourpence for it, and on October 19 he handed the bottle and its contents over to Mr. Moon at his (witness's) house. The bottle and contents were in the same condition then as when he made the purchase.

By Mr. Singleton: It was in the afternoon, between three and four o'clock. There was no one with him, and no other person in the shop.

How are you paid for this?

Mr. Grey: I object to this question.

The Judge: You should not object. Let this matter go on. (To witness) How are you paid?

Witness: On each purchase I am paid 5*s.* by the Society.

Mr. Singleton: Does that 'pend on whether there is a penalty or not?

Witness: The amount is paid independent of the penalty.

The Judge: If ever there was an informant properly employed it is in cases of this sort. In these cases you cannot do without them. A detective must be employed in certain branches of life. I mean to say, Mr. Grey, I never would object to a question of that sort.

Mr. Singleton (to witness): Was the bottle full when you got it?

Witness: Not full.

How much?—A little more than half full.

Did you see him put the laudanum in?—I saw him put two articles in it.

What did you do with the bottle?—Sealed it up and handed it to Mr. Moon on October 19.

It was not sealed up, then, when you got it from the defendant?—No, I sealed it up myself.

Why did you not take someone with you?—I did not suppose it essential to have anyone with me.

There is no one to corroborate your statement?—No.

If you had felt so inclined you could have put laudanum in this bottle and sealed it up?—I am not in the habit of doing so.

Harry Moon, clerk in the office of the Registrar of the Pharmaceutical Society, stated that on October 19 he received a bottle from the last witness. The bottle produced was the bottle in question; it was handed over to Mr. Eastes to analyse.

Ernest John Eastes, analytical chemist, F.I.C., assistant to Professor Attfield, stated that on November 30 he received the bottle produced of the last witness. It was sealed up, and he carefully analysed the contents. The bottle was three-parts full. He found it to contain a preparation of opium in the proportion of half an ounce of the tincture of opium, known as laudanum. The quantity was a dangerous one. The smallest amount of laudanum known to have killed an adult person had been a quarter of an ounce. Of course to infants the poison was specially dangerous.

By Mr. Singleton: There was an authority—the case was recorded in Taylor's 'Medical Jurisprudence'—where it was stated that two drachms of laudanum had killed a person.

Mr. Singleton, for the defendant, denied that Hayton ever sold the poison.

The Judge: Does he deny having sold it to Mitchinson?

Mr. Singleton: He denies ever seeing Mitchinson in his life.

The Judge (to Mitchinson): Have you ever seen that man (pointing to Hayton) before?

Mitchinson: Yes, sir.

The Judge: Do you know him?

Mitchinson: Yes.

Where have you seen him?

Mitchinson: I saw him in the shop when I purchased the laudanum.

Mr. Singleton: In addition to the defendant denying that he ever sold this poison I submit that, according to a recent case decided on October 31 last year, the defendant is not liable.

The Judge: In that case the judge decided on facts.

Mr. Singleton: And his judgment was appealed against and the appeal affirmed.

The Judge: That was a very different case to this. If you can reduce the point in this case to a slight minimum of one-fiftieth of a grain, then I should have no difficulty in helping you, and there I should come in as a judge of facts. But here there is a gentleman who has determined the amount and has no doubt as to what it would do.

### *Evidence for the Defence.*

The defendant was then called and admitted he was not a registered person according to the Pharmacy Act, but he had passed the Westminster College examination.

Mr. Singleton: You have heard the evidence of Mr. Mitchinson?—Yes.

It is a very serious matter—did you ever see the man in your life before?—Not to my knowledge till this morning.

Did you ever sell him any poison?—Not to my knowledge.

The Judge: Show him the bottle, please (the bottle was shown to defendant).

Did you sell him that bottle?

Witness: Well, I could not say, your Honour.

The Judge: Do you say whether that bottle came from your shop or not?

Witness: I cannot say whether it was sold by me to him.

The Judge: Did you ever sell him any poison?—No, certainly not.

By Mr. Singleton: He never sold any laudanum at 117, Wincomlee. He was particularly on his guard not to sell it. The reason for that was because he understood one or two local chemists were doing their utmost to get him into the clutches of the Pharmaceutical Society. Therefore he was specially prepared against strangers. It was his habit to label bottles "poison" when there was no poison in them.

The Judge: Stop a moment. Is that one of your labels on the bottle?—It is a likely sample of mine.

Do you swear it is not yours?—I could not say it is one of mine.

Is it your practice to put such labels on bottles not containing poison?—On liniment, camphor, etc. My object in doing so is to safeguard the public.

By Mr. Singleton: He considered that two drachms of tincture of opium would kill a person, but, in this case, it was a liniment, and it was not often people would take liniment inside. He had sold any amount of tincture of opium under the direct supervision of a qualified person, but never in his own place. Neither had he sold any of the other poisons scheduled in the Act. He received a letter from the Society demanding payment of £5 penalty for selling poison. He at once wrote denying that he had sold poisons. He still asserted that he never sold any poison in the bottle produced.

By Mr. Grey: To his knowlege Mitchinson had never been in his shop. He had a very good memory for faces, but he could not swear that he never sold the bottle [produced] and its contents to Mitchinson. Neither could he swear that the label on the bottle was not put on by him.

The Judge: At any rate, if you sold him the bottle and the stuff it had not laudanum in it?

Witness: No.

The Judge: Do you keep any laudanum in your shop?

Witness: No.

The Judge: Have you ever had any preparation of opium in your shop in 117, Wincomlee?

Witness: I have had a little preparation of opium.

The Judge: How much?

Witness: A little for my own use.

The Judge: Where did you get it from?

Witness: From Lofthouse and Saltmer.

The Judge: And what was the amount you got?

Witness: Two or three ounces.

The Judge: Where do you get the rest of your drugs from?

Witness: From Messrs. Lofthouse and Saltmer.

The Judge: So you got this from them at wholesale price?

Witness: Oh, yes.

The Judge: Did you really use it for your own infirmities?

Witness: Yes, your Honour.

The Judge: How long have you been in this shop?

Witness: Since January, 1893.

The Judge: And how soon did it come to your knowledge that there was a syndicate of local chemists banded together against you?

Witness: Within a month.

The Judge: And you were very cautious in consequence?

Witness: Yes, your Honour.

The Judge: Very careful?

Witness: Yes. May I make a remark, your Honour? I consider this bottle, as I did not label it laudanum, ought to have been sealed in my presence. The witness took it out of my shop and sealed it up.

The Judge: There is always that possibility, no doubt about that.

By Mr. Singleton: The reason he did not appear on the first hearing of the case was because he was served with the summons on November 10, and in it he was told to appear on November 6, and he found that rather difficult. He took no steps in the matter because he expected to hear further from the court. The bailiff got out of the shop before he discovered the mistake. In fact, he did not make the discovery till next morning, and he knew nothing about the case until he saw the reports of the proceedings in the daily papers. That was on the evening of December 6.

The Judge: Did you look at the calendar to see the date?

Witness: No.

The Judge: The sixth was a Monday. Application was made for a new trial at the January court?

Mr. Grey: Yes.

Mr. Singleton: In the meantime costs had been sent in and the Registrar instructed my client to apply for a new trial, and it was then he instructed me.

By Mr. Grey: He did not tell the bailiff he would take no notice of the summons as he had nothing and plaintiffs could get nothing. When he saw the dates on the summons the conclusion he came to was that there had been a mistake. He expected the officials of the court would have found out the mistake as soon as he did. He therefore thought the right thing was to say nothing, until he received a letter from the solicitors to the plaintiffs on December 18 fixing a day for taxing the costs.

The Judge said this was a very crafty case. Defendant had given plaintiffs the trouble of coming to Hull twice over a matter which he might have settled.

Mr. Grey asked for costs in this case. It was no fault of the plaintiffs.

The Judge: I cannot do it. I am not at all sure that when the Society employs an informer that the informer should not be instructed to seal the purchase in the presence of the seller. The only mistake in this case is that it has been left open to say that the informer put the laudanum in to make a case. Hayton said he never put the laudanum into the bottle, and Mitchinson said Hayton did. Which am I to believe? I believe Mitchinson. The Society has learned a lesson to-day. The instruction to give to informers is, "You get your bottle, seal it up in the seller's presence, and then take it away. If he won't let you seal it up in his presence then do it somewhere else." That will save the men from being liable to being told that they put the laudanum in. In this case the verdict must be for the plaintiffs. The defendant has only gained a little time by his foolish conduct. Such conduct never pays. I give a verdict for the plaintiffs for the same amount as before, and costs.

### Illegal Sale of Laudanum at Leicester.

At the County Police Court, Leicester, on February 28, Jesse William Crossby, grocer, Blaby, was fined 40s., including costs, for selling laudanum in a bottle which did not bear his name. Mr. Hincks appeared for Mr. Crossby, who pleaded guilty, and explained that his client took over the business of a grocer some years ago, and there was then in stock a number of small bottles of laudanum bearing the name of the chemist at Leicester from whom they had been purchased wholesale. Defendant was assured that he could sell the laudanum as it was, but of course no excuse could be offered for his ignorance of the law. He pointed out that a caution to wholesale dealers who supplied the laudanum would do more good than punishing individual shopkeepers. This prosecution arose out of the startling disclosure that a young girl had been able to obtain a large quantity of the poison without the slightest difficulty, and then drank the entire dose in order to commit suicide. Thanks to the energetic efforts which were at once made to avert a fatal issue, the girl recovered. But the mere fact that she was thus allowed to obtain a dangerous quantity of a poison which should be sold under certain restrictions, showed that the would-be victim was by no means the only one to blame in the matter.—*Leicester Daily Post* and *Leicester Free Press.*

## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

### Sale of Deficient Tincture of Rhubarb.

At the Birmingham police court, on March 9, before Messrs. Fisher and G. Tangye, Frederick Johnson Richards, chemist and druggist, Dudley Road, was summoned under the Food and Drugs Act for selling a drug which was not of the substance and quality of the article demanded—to wit, tincture of rhubarb containing only 82 per cent. of the drug named.

Mr. Masser, of Coventry, who appeared for the defendant, said the character and quality of the drug sold was not disputed. It was sold by mistake.

The inspector proved having called at the defendant's shop on the 15th ult. and asking for four ounces of tincture of rhubarb, for which he was asked to pay two shillings. During the day he had bought samples of the same quantity for prices varying from 10*d.* to 1s. 4*d.* He told the assistant who served him for what purpose he required the sample.

Dr. Hill, the public analyst, said he analysed the sample, and found it contained only about 82 per cent. of the necessary ingredients. He put the percentage at 82 in order to be on the safe side, but in reality it was 80 per cent.

In reply to Mr. Masser, Dr. Hill said he was not aware that there was an article of commerce known as compound tincture of rhubarb. He knew that according to the old pharmacopœia there was such a tincture.

Mr. Fisher: Did the bottle bear the label "compound tincture of rhubarb"?

Mr. Masser replied that it did not. He admitted that there had been a mistake, and that the compound tincture should not have been sold. He explained that the mistake occurred in one of two ways. When defendant first entered business he had one bottle of the compound tincture sent him, and it might have been that there was a little of that left, and used in error; or, on the other hand, the wholesale firm must have sent him the compound tincture by mistake.

The defendant, in his evidence, said the bottle of compound tincture he had sent him when he started business had been used up some time ago, and therefore the error must have been on the part of the wholesale firm in recently sending him the compound tincture in place of the British Pharmacopœia tincture. He did not profess to sell the compound tincture.

Mr. Frank H. Alcock, analyst, said he had analysed the drug in question, and found it was tincture of rhubarb according to the London Pharmacopœia, and was of good commercial rhubarb.

Mr. Fisher: Should you say it was tincture of rhubarb?

Witness: I should say that it was.

Mr. Masser: Not according to the British Pharmacopœia, but according to the London Pharmacopœia?

Witness: Yes. The taste of the latter drug is pleasanter, and it is in more demand in some parts of the country.

The Magistrate's Clerk: But Mr. Richards says he does not sell it.

Questioned as to the relative medical value of the two drugs, the witness said he was not a medical man, and could not speak to their efficacy.

Mr. Fisher: It is clear, is it not, that the compound tincture is not so valuable?

Witness: I cannot say. Commercially there is very little difference.

Cross-examined: Tincture of rhubarb and compound tincture of rhubarb were synonymous terms.

Mr. Fisher: What should be sold to a customer asking for tincture of rhubarb?

Witness: It depends upon the custom in the district. I have not had the selling of it myself. I am in the manufacturing department.

Defendant, recalled, said he did not consider the tincture and compound tincture were the same thing. The tincture was the higher-priced article.

The magistrates, in fining defendant £3 and costs, said it was quite clear that the case had been proved. If the sale was due to an error it was a very gross error, for which the defendant must bear the responsibility. It was most important that the public should be protected.—*Birmingham Daily Post.*

## RECENT POISONING CASES.

### Suicide by Strychnine Poisoning.

Mr. E. B. Reece, coroner, held an inquest at Bridgend on Wednesday, March 7, touching the death, from poisoning, on the preceding Monday, of a young man named Llewellyn Beamer Lloyd, the son of Mr. John Lloyd, chemist, Dunraven Place. It appeared that deceased, who assisted his father in his business, went to Ogmore on Sunday, and on his return, shortly after he had retired, his father, alarmed by his shrieks, ran to his bedroom, and found him in convulsions. Asked whether he had taken anything, he said nothing to hurt him. His father administered an emetic, and sent for the doctor, but death ensued. His father subsequently missed a drachm and a half of strychnine from a bottle in the shop, to which his son had access. Dr. Naunton Davies deposed that death was due to strychnine poisoning, and, after considerable deliberation, the jury found that deceased committed suicide while temporarily insane.—*Western Mail.*

### Accidental Poisoning by Carbolic Acid.

A most painful case of accidental poisoning, in which a mother was unwittingly the cause of her son's death, was reported on March 13 to the Birmingham coroner. On Sunday evening Mrs. Homer, of 19, St. Martin's Street, administered to her son Thomas, 15, who was ill, a dose of what she thought was medicine, but which afterwards turned out to be carbolic acid, which the doctor attending the boy had given directions to be used for disinfecting purposes. The bottle containing the poison had been placed amongst a number of other bottles, one of which contained medicine. Medical aid was summoned, but proved unavailing, the unfortunate youth expiring in great agony about an hour after the administration of the poison.—*Birmingham Daily Gazette.*

### Suicide by Drinking Poisonous Liniment.

On Monday, March 5, Mr. R. E. Clarke, coroner, held an inquest at Dorset Barn, Shrewsbury, touching the death of Sarah Capper, 40, single woman, who died on Saturday night at the residence of Mr. William Capper, her brother, from the effects of swallowing a quantity of liniment. From the evidence it appeared that deceased, who was suffering from lowness and depression, during the temporary absence of a lady who was taking care of her, got up, and making her way into another bedroom, took out of a cupboard a bottle containing some liniment, which had been placed there in her presence some months ago. Deceased then returned to her room, where she drank the contents of the bottle. A doctor was promptly called in, but she never recovered, and died about a quarter-past eleven at night. The label on the bottle from which deceased drank the liniment was an ordinary white one. The jury returned a verdict of "Suicide during temporary insanity," Councillor Robbins (foreman) adding that the jury wished to strongly recommend that for the future the regulations with regard to labelling bottles containing poisons with coloured labels should be more strictly adhered to, so that people under all circumstances should be better protected from accident or misadventure. The coroner expressed his full concurrence with Mr. Robbins's remarks.—*Shrewsbury Chronicle.*

### Suicide by Chromic Acid Poisoning.

On March 12 an inquest was held at the Terrace Hotel, Birkby, before Mr. J. E. Hill, deputy coroner, on the body of Sarah Amelia Dixon, aged 34 years, wife of John George Dixon, mechanical engineer, 98, Norman Road, who died on the previous Friday night, at eleven o'clock, from the effects of taking chromic acid. Mrs. Dixon was confined on February 8, and went on favourably till a fortnight ago, when she had a serious relapse, showed signs of mental derangement, and Dr. Baldwin, fearing suicidal tendency, gave instructions that she was to be watched day and night. On the Friday morning the doctor saw her, and made arrangements for her to be sent to a retreat. In the afternoon she was in the dining room, and while her boy, aged 13 years, and her husband were there, she got from the cupboard a bottle containing powdered chromic acid, which her husband had bought for an electric battery, and took a large quantity. The boy never saw her with the bottle, and Mr. Dixon admitted he was drunk and incapable, and knew nothing of what took place, he having been greatly upset by a communication the deceased had made to him, and got too much to drink. The doctor said that he had known Mr. Dixon six years, never knew him the worse for drink before, and he had always treated his wife with kindness and consideration. The jury returned a verdict of "Suicide while temporarily insane."—*Leeds Mercury.*

### Suicide by Ammonium Sulphocyanide.

On Wednesday, February 28, the borough coroner (Mr. H. Saunders French) held an inquest at the Hoop Hotel, Bridge Street, Cambridge, on the body of Florence Eliza Stearn, aged 35, who had died after taking sulphocyanide of ammonium. Mr. David John Rygate, surgeon, deposed to being called in to see the deceased at 9.30 p.m. on Sunday, February 25, when he was informed that, about 2 p.m., she had taken sulphocyanide of ammonium. The father of the deceased then told witness the story of the events of the day. Five grains of the poison taken would cause immediate death. Witness ordered the deceased to bed, and at 2.30 a.m. on Monday he found her unconscious, with rigidity of the muscles of the arms and jaws. By injections of ether attempts were made to revive her, but convulsions ensued and the deceased expired on Monday evening at 6.30. A post mortem of the body had been made. He was of opinion that the deceased died from convulsions, whether caused by taking poison or not he was not absolutely certain, as he was not sufficiently competent to detect the small amount of poison which had been taken. The remedies applied got rid of the greater part of the compound, and he had not much doubt that the deceased died of the after effects of the small quantity which got into the system. The jury returned a verdict of "Death from convulsions, probably caused by taking a quantity of sulphocyanide of ammonium whilst of unsound mind."—*Cambridge Chronicle.*

### Suicide by Cyanide of Potassium.

An inquest was held at the Town Hall, Brighton, on March 12, on the body of William King Southon, a gasfitter, late of 16, King's Road. The evidence showed that the deceased, who was 73 years of age, had been for some time very depressed, consequent on a paralytic stroke. After dinner on Friday he took some cyanide of potassium, which was used in his business, and died before a doctor could arrive. A verdict of "Suicide whilst of unsound mind" was returned.—*Sussex Daily News.*

### A Magistrate on the Sale of Poisons.

Before the Penge magistrates on Tuesday, Emily Rumble, otherwise Gobby, seventeen, a domestic servant, of Hamilton Road, West Norwood, was charged, on remand, with attempting to commit suicide by swallowing a quantity of oxalic acid. She was now handed over to the care of the Rev. Walter Hobbs, who said he had found a home for her. Addressing Mr. Lines, assistant to Mr. Izod, a chemist, of Church Road, Upper Norwood, who had served the girl with the poison, Dr. Hetley, the Chairman, said the Bench required him to give some explanation of how he came to sell twopennyworth of a deadly poison like oxalic acid to the prisoner on her bare statement that she required it for cleaning purposes. Mr. Lines said the Act did not require him to ask any questions at all when selling oxalic acid and many other poisons. Dr. Hetley said he was quite aware that the Act relating to the sale of poisons omitted to include oxalic acid in the schedule (*sic*), which, of course, was a very great blunder, but nevertheless, a chemist knowing it to be a deadly poison, the question arose whether or not, in the interest of the public and in the interest of his own reputation, he should not try to do his best to correct the omission of the Act. The Bench considered that the witness ought to have asked this girl some questions, and not been content with her statement.—*Morning Post.*

## Obituary.

Notice has been received of the death of the following:—

On March 2, Henry Davies Maries, Pharmaceutical Chemist, of Watford. (Aged 68 years). Mr. Maries was a life member of the Society, and a supporter of the Benevolent Fund. His health had been bad for many years, and was the cause of his retiring from business so far back as 1880.

On March 6, J. Holliday Powley, Chemist and Druggist, late of Brighouse, Yorks. (Aged 50 years).

On March 9, Henry Ayscough Thompson, Pharmaceutical Chemist, of Worship Street. (Aged 75 years). Mr. Thompson's membership with the Society dates from 1845, and he has been a loyal and generous supporter of the Benevolent Fund for many years.

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only. Names of plants should be underlined, and capitals used for generic names only.*

### Medical Men and Pharmacists.

Sir,—Although no upholder of counter prescribing, I wish to point out the disadvantages the chemists suffer from in this locality of over 30,000 inhabitants. There are ten doctors, not including assistants, all doing their own dispensing, and, in addition, they supply their patients with medical comforts, such as Valentine's Meat Juice, etc., also supplying trusses, enemas, elastic stockings, etc., and last, but by no means least, keep a stock of enemas which they lend out among their patients. In face of all this, you cannot blame a chemist altogether for making an extra penny on counter prescribing when he has the chance. There are also a couple of "Limited" Drug Co.'s in the town, so, on the whole, it is pretty lively. Yorkshire.

## Diary of the Week.

Tuesday, March 20.

*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Evolution" (with lime-light illustrations), by J. R. Logan.

Wednesday, March 21.

*Western Chemists' Association (of London)*, at 9 p.m.
Smoking Concert at Westbourne Restaurant, 1, Craven Road, W.

*Royal Microscopical Society*, at 8 p.m.
"Notes on the Uropodinæ," by A. D. Michael.

Thursday, March 22.

*Chemical Society*, at 8 p.m.
Anniversary Meeting; Presidential Address; Election of Officers and Council.

## Books, etc., received.

Zur Kenntniss des Rosenöls. By J. Bertram and E. Gildemeister. Reprinted from the 'Journal für Praktische Chemie.' Pp. 12. Leipzig: Johann Ambrosius, Barth. From the Authors.

Saint Bartholomew's Hospital Reports. Edited by W. S. Church, M.D., and W. J. Walsham, F.R.C.S. Vol. xxix. Pp. i.-xxix., 1 to 410. 8s. 6*d*. London: Smith, Elder and Co. From the Hospital.

Report of the Port of London Sanitary Committee, with the half-yearly report of the Medical Officer of Health for the Port of London, to December 31, 1893. From the Committee.

The Student's Introductory Handbook of Systematic Botany. By Joseph W. Oliver. Pp. i.-xvi., 1 to 366. 4s. 6*d*. London: Blackie and Son. From the Publishers.

Food and Drink rationally discussed. By Thomas Dutton, M.D. Pp. i.-vii., 1 to 124. 2s. London: Henry Kimpton, Hirschfeld Brothers. From the Publishers.

Cultuur, Bereiding en Handel van Liberia Koffie. By F. W. Morren. Reprinted from "De Indische Mercuur." Pp. 36. Amsterdam: J. H. de Bussy. From the Author.

Pharmacopoea Helvetica. Editio Tertia. 1893. Pp. i.-ix., 1 to 398. Zurich: Art. Institut Orell Füssli. From the Swiss Pharmacopœia Commission.

Latrines of the East. By Edw. S. Morse. Reprinted from the 'American Architect.' Pp. 18. From the Author.

Companion to the Latest Edition of the British Pharmacopœia. By Peter Squire. Sixteenth Edition. Revised by Peter Wyatt Squire and Alfred Herbert Squire. Pp. i.-xl., 1 to 693. 12s. 6*d*. London: J. and A. Churchill. From the Revisers.

Science Progress. Edited by J. Bretland Farmer, M.A. Vol. I., No. 1. Pp. 104. 2s. 6*d*. London: The Scientific Press, Limited. From the Editor.

*Erratum.*—We are requested to note that the following subscription to the Benevolent Fund is not acknowledged in the Calendar for 1894 or the Journal for February 24:—Alexander, J., 88, Gallowgate, Aberdeen, 5s.

Communications, Letters, etc., received from Messrs. Brown, Church, Francis, Hill, Morgan.

# CANELLA BARK.

## A STUDY OF ITS STRUCTURE.

BY HENRY G. GREENISH,
*Professor of Materia Medica to the Pharmaceutical Society of Great Britain.*

### INTRODUCTION.

The natural order Canellaceæ is a small one, comprising but three genera and five species, confined to tropical or subtropical regions.

*Canella alba* is a tree varying from ten to fifty feet in height, distributed over the West Indian Islands. The bark is collected in New Providence and exported from Nassau under the name of "canella," "wild cinnamon," or "cinnamon" bark. The observation having been made that the descriptions of the structure of this bark are in certain details inaccurate and incomplete, an examination of authentic and commercial specimens appeared desirable. An intimate knowledge of its structure would, it was hoped, throw some light on the identity of doubtful specimens.

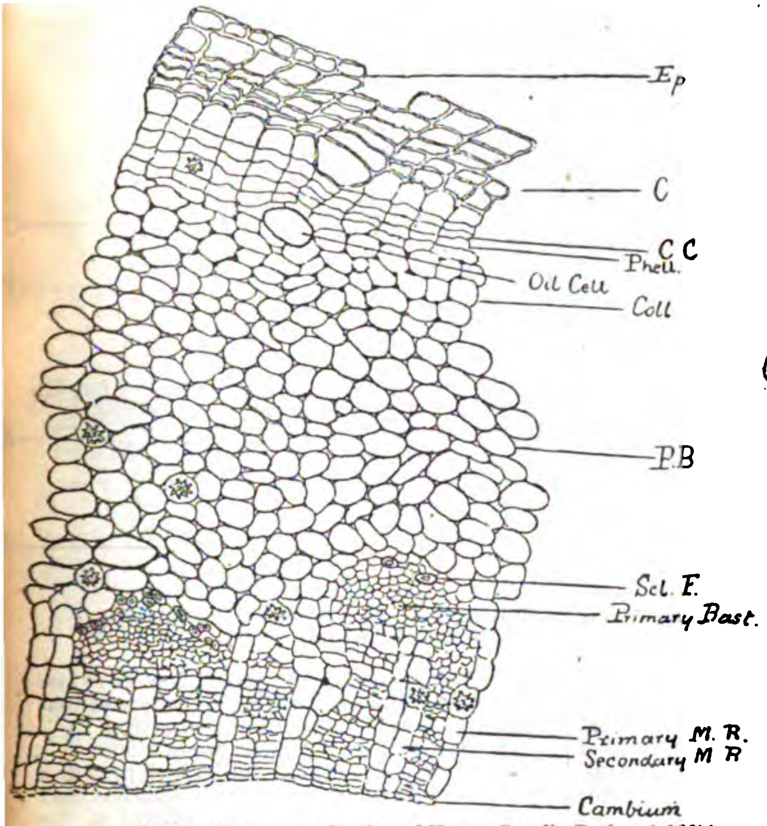

Fig. 1.—Transverse Section of Young Canella Bark. (x100)*

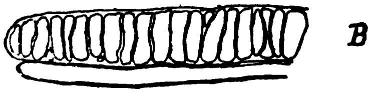

Fig. 2.—Portion of Sieve-tube with companion cell, the sieve areas outlined only. (x320)

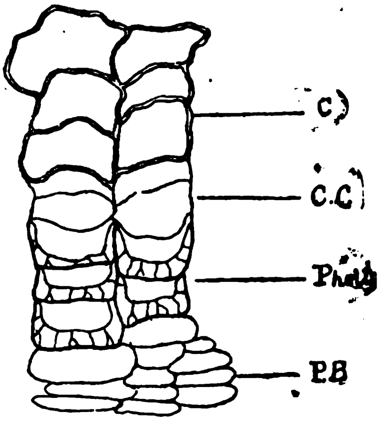

Fig. 3.—Portion of Transverse Section; formation of periderm and phelloderm. (x180)

To attain this object it was necessary not only to have an accurate knowledge of the structures present in normal specimens, but also to be acquainted, as far as possible, with the variations from the normal that are likely to be met with.

### EXAMINATION OF AUTHENTIC SPECIMENS.

The authentic material examined consisted of the plant cultivated in the gardens of the Royal Botanic Society, a specimen in the Herbarium of the Pharmaceutical Society, and a sample of the bark sent in 1868 to Daniel Hanbury by Mr. Rawson, then Governor of the Bahamas. For the latter two specimens and other valuable material I am indebted to the liberality with which the Council of the Pharmaceutical Society has placed at my disposal the resources of its museum.

The examination of a living twig shows that amongst the first cells to differentiate are the oil cells, which are plainly visible before any formation of protophloem can be observed. The fibrovascular bundles, however, soon follow and form a nearly continuous ring, the bast portions being subtended by crescent-shaped groups of collenchymatous cells varying from one to three rows in thickness, which doubtless form part of the pericycle, although an endodermis cannot be distinctly identified. At this period numerous young oil cells —the walls of which are somewhat thickened and, with the exception of an inner cellulose membrane, suberised and lignified—and cells containing rosettes of calcium oxalate, are distributed throughout the whole of the ground tissue; the epidermis remains intact, and three or four rows of cells next to it develop into a collenchymatous hypoderma.

The formation of a complete cambium ring results in the production of new tissue and consequent compression of the cells of the pericycle, the outer of which now develop into sclerenchymatous fibres, at first isolated, but subsequently extending to arcs protecting the primary bast (Fig. 1, Scl. F.). These fibres, with long tapering ends and few pores, have the character of true bast fibres. They must, however, be considered as part of the pericycle. The first hypodermal layer of cells develops into a cork cambium (Fig. 1, C. C.), producing centripetally cork cells, the walls of which rapidly thicken, suberise, and lignify (Figs. 1 and 3, C.). These cells generally contain a brown amorphous mass, difficultly soluble in solution of potash. Simultaneously the cork cambium produces centrifugally a phelloderm, the cells of which may either remain thin (Figs. 1 and 6, Phell.) or thicken and lignify (Fig. 3, Phell.). The primary bark (Fig. 1, P. B.) is composed of parenchymatous cells marked with large pores, and containing minute simple or compound starch grains, numerous oil-cells, and cells containing rosette crystals of calcium oxalate (Fig. 1). Similar crystals are generally conspicuous in the medullary rays, which usually consist of one row, sometimes two rows, of radially elongated cells (Fig. 4). The secondary bast is composed of alternating rows of bast parenchyma (Fig. 4, B. Par., Fig. 7) and sieve tubes with companion cells (Fig. 4, S. T.).* The sieve tubes are characterised by their rounded ends and the presence of numerous sieve plates, separated by narrow bands of cellulose on their radial walls (Fig. 2). Similar observations were made with herbarium material.

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* In all the illustrations the cell contents, with the exception of calcium oxalate and, in two cases, oil (or resin), have been omitted. For explanation of the lettering the text must be consulted.

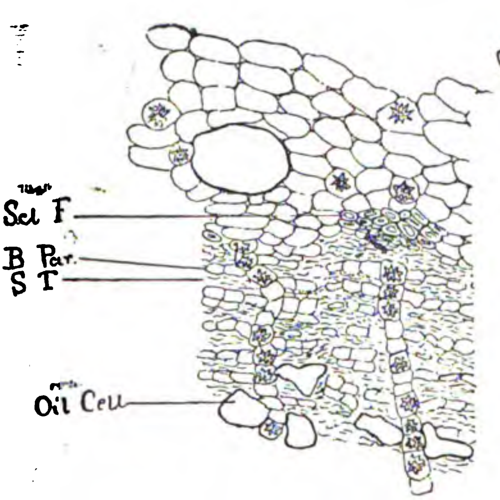

Fig. 4.—Portion of Transverse Section (Commercial bark). (x100)

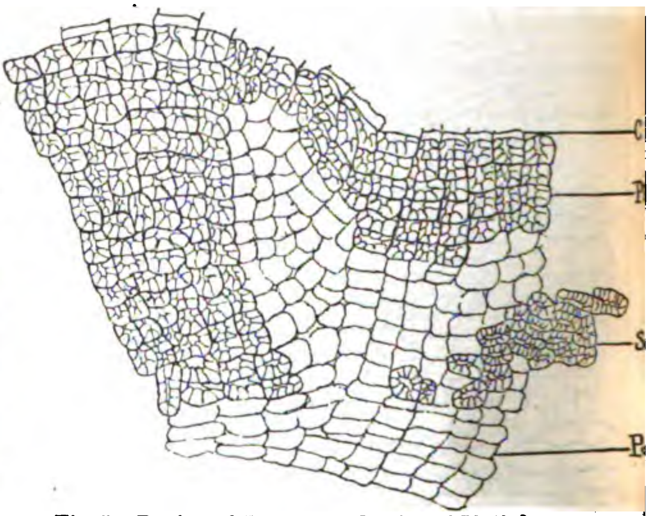

Fig. 5.—Portion of Transverse Section of Phelloderm (Commercial bark). (x100)

A small branch, 13 Mm. in diameter, from a specimen in the Hanbury collection, showed a practically identical structure. Here the sclerenchymatous fibres of the pericycle are very distinct. The phelloderm consists generally of oblong or nearly square cells, the radial and inner tangential walls of which rapidly thicken and lignify until the lumen nearly disappears (Fig. 3, Phell.). Intervals, however, occur, in which this sclerenchymatous phelloderm is either absent or much interrupted. Its place then appears to be taken by a cellulose phelloderm, consisting of regularly arranged radial rows of thin-walled cells, in many of which a single rosette crystal of calcium oxalate has been deposited, and some of which develop into oil-cells. This thin-walled phelloderm may also contain starch, with little or no oxalate, thus differing from the primary bark only in the radial arrangement of its cells (see Figs. 1 and 6, Phell.). It may replace the sclerenchymatous phelloderm, or succeed it, or alternate with it.

The increase in the primary bark takes place, as usual, by division, chiefly radial, of the component cells. Frequently this division takes place so regularly as to form radial lines of meristematic tissue, extending into the medullary rays.

In an older bark from the same specimen the sclerenchymatous fibres of the pericycle have been forced from their original position by the pressure caused by the growth of the secondary bark. This pressure also results in the obliteration of the sieve tubes, the bast parenchyma being left more or less intact, hence the characteristic alternations of bast parenchyma and obliterated sieve tubes (Fig. 7).

EXAMINATION OF COMMERCIAL SPECIMENS.

Thin pieces of commercial canella bark present a precisely similar structure. The periderm has been removed, separation having been effected at the weakest point, viz., the cork cambium, portions of which remain attached to the phelloderm (Fig. 5, C.). Calcium oxalate in rosette crystals is distributed throughout the middle bark, sometimes abundantly. The oil cells are filled with pale or dark yellow oil or resin, small globules of which can also be observed in the parenchymatous cells. From causes already indicated the sclerenchymatous fibres frequently occupy an abnormal position. The medullary rays are mostly one-celled, and contain calcium oxalate; the sieve tubes near the middle bark are more or less obliterated (Fig. 4).

In the bast parenchyma numerous oil cells containing yellow oil (or resin) occur; they are axially elongated, and appear in transverse sections considerably smaller than the corresponding cells of the middle bark, which are spheroidal or tangentially elongated.

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* Compare with corresponding tissues in Figs. 1 and 7.

In thicker barks the sclerenchymatous fibres are extremely difficult to detect in transverse sections; they may generally be found by cutting tangential sections near the phelloderm. The latter may number as many as twenty (possibly more) rows of cells, projecting irregularly into the middle bark, which may be crowded with oil cells and calcium oxalate.

Meristematic tissues may also form in the primary bark and produce, in radiating lines, a secondary parenchyma (Fig. 5, Par.) resembling the thin-walled phelloderm in containing starch, oil cells, calcium oxalate, and even sclerenchymatous cells (Fig. 5, Scl.), which, however, exhibit a uniform thickening. This growth of the primary bark, aided, perhaps, by that of the secondary bark, results in fracture, at intervals, of the sclerenchymatous phelloderm, portions of which are thrown off into the periderm by the formation of a cork cambium on the inner side. The removal of the rigid phelloderm permits of radial and tangential expansion; the tissue will project beyond the neighbouring phelloderm, and form in its turn, by the activity of the cork cambium, a projecting sclerenchymatous phelloderm. This is probably the manner in which the characteristic pitted surface of canella bark is produced. In the section shown in the illustration (Fig. 5) the phelloderm will fracture at its thinnest point, and on the right edge of the pit (not figured) it has so fractured; the layer of parenchyma on its inner side is developing into a cork cambium.

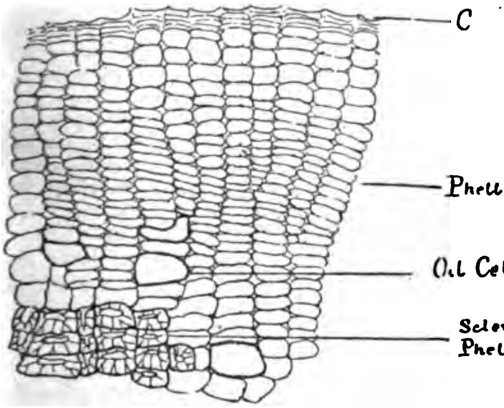

Fig. 6.—Transverse Section through part of a white spot (Commercial bark). (x100)[*]

Many specimens of canella bark are marked with white warts. These consist of the thin-walled phelloderm previously alluded to, and are composed of small, tangentially elongated, parenchymatous cells, together with here and there a larger oil cell (Fig. 6). In each of the parenchymatous cells a single rosette of calcium oxalate, enclosed in a delicate suberised membrane,[†] has been deposited. This tissue closely resembles cork in appearance; the cell walls, however, neither suberise nor lignify; the tissue exhibits intercellular spaces, and is formed centrifugally. It occasionally extends over a considerable area.

A remarkable feature of many canella barks, but especially old specimens, is the fact that the collapsed sieve tubes (Fig. 7, S. T.) yield in places the usual lignin reactions with phloroglucin and hydrochloric acid, chlor-iodide of zinc, and aniline chloride, and absorb aniline colours (methyl green) after bleaching and clearing. Similar reactions are frequently yielded by the resin contained in the oil (resin) cells, and by certain cell contents in the secondary bark. The possible lignification of the sieve tubes has been asserted by Hartig and Vesque, but denied by Lecomte. Considering that the nature of lignification is practically unknown, that the lignin reactions simply indicate the regular occurrence of certain classes of chemical substances

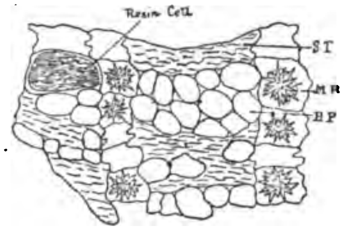

Fig. 7.—Portion of Transverse Section through the secondary bark (Commercial bark). (x160)

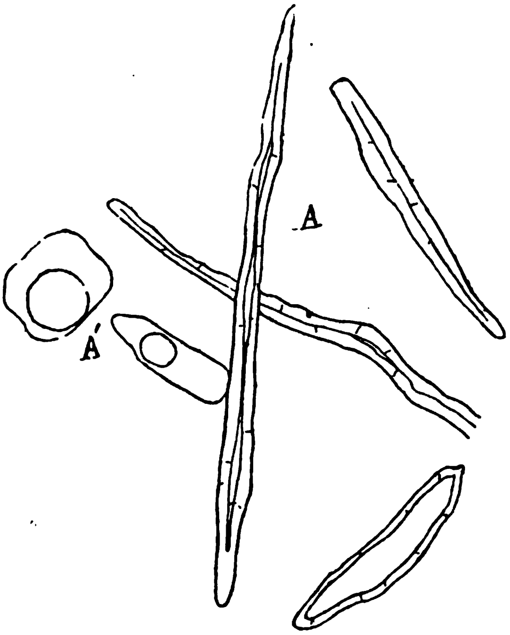

Fig. 8.—Isolated Sclerenchymatous Cells (A) and Oil Cells (A') (Commercial bark). (x100)

in lignified tissues, and that the resin in the resin cells also shows such reactions, the conclusion that the sieve tubes are here lignified is not warranted. Probably the reactions yielded by the cell-walls are due to an infiltration of substances similar to those which produce the same reactions in the resin.

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[*] To render the structure clearer, the calcium oxalate has been omitted.

[†] This membrane is coloured yellow by chlor-iodide of zinc; yellowish by concentrated (20 per cent.) solution of caustic potash, which causes it to break down into minute globules when heated; and it resists even hot concentrated sulphuric acid for some time. {On the other hand, it absorbs and retains methyl green after bleaching and clearing; the xanthoprotein reaction succeeds; but with Millon's reagent and with phloroglucin and hydrochloric acid negative results were obtained. Possibly an inner protoplasmic membrane is present.

Most parcels of canella bark contain pieces remarkable for their somewhat rough but not pitted exterior; in them the sclerenchymatous phelloderm is much reduced, or almost absent. They are particularly characterised by the presence in the secondary bark of isolated sclerenchymatous cells. These cells vary in shape from oblong to long and narrow; the ends are usually rounded or truncate (seldom acutely tapering); they are marked with pores, and lignified (Fig. 8, A). In these barks the effect of pressure on the sieve tubes is less conspicuous. In no other canella barks are sclerenchymatous cells observable in the secondary bark.

Against the possible argument that the presence of these sclerenchymatous cells in itself indicates the bark to be something other than that of *Canella alba*, may be urged the fact that parcels of canella generally contain such pieces of bark, that they exhibit, when examined, a varying number of such cells, indicating a transition to ordinary canella, that the only other differences observable (reduction of the sclerenchymatous phelloderm and comparative absence of radial pressure) are, from a biological point of view, consistent with the production of other mechanical elements.

Not unfrequently commercial canella bark is marked with rusty-brown spots. These consist of thin-walled phelloderm, the cells of which contain starch, together with a brown amorphous substance, sparingly soluble in solution of potash. A few cells are entirely filled with a similar dark red mass, upon which even hot solution of potash has no apparent action. Such cells occur in the primary and also—but very rarely—in the secondary bark.

The occurrence of sclerenchymatous cells and cells with red resin in the secondary bark are points of interest, inasmuch as these have hitherto been considered distinctive features of the bark of *Cinnamodendron corticosum*. According to the present observations the difference is relative rather than absolute.

### DESCRIPTION OF STRUCTURE.

From the examination of numerous specimens of canella bark the following description of its structure has been compiled:—

*Periderm.*—When present, consists of thick-walled cells, lignified and suberised, frequently containing a brown amorphous mass. In old barks the periderm often contains groups of sclerenchymatous cells (phelloderm), which have been included in it during the process of growth.

*Phelloderm.*—Usually consists of cells much thickened and lignified on the inner tangential and both radial walls. Pores numerous, branched. This sclerenchymatous phelloderm may comprise twenty (possibly more) rows of cells, or may be almost entirely absent, or may be replaced by or alternate with a thin-walled, non-lignified, phelloderm. The cells of the latter are generally arranged radially, contain small starch grains or oxalate of calcium in rosette crystals, occasionally a red amorphous substance, and include oil cells.

*Middle Bark.*—Limits not well defined; usually about twenty rows of cells, with large pores, tangentially elongated, the outer frequently more or less obliterated. It almost invariably contains oxalate of calcium, sometimes in abundance, and numerous oil cells, the walls of which are somewhat thickened, suberised, and lignified (?). The oil (or resin) contained in them varies from pale yellow to dark yellow or red-brown; in the latter case it dissolves in caustic potash easily and completely; it frequently yields lignin reactions.

*Pericycle.*—In a very early stage some of the cells of the pericycle develop into sclerenchymatous fibres, which are conspicuous in young barks, but very difficult to detect in old ones.

*Inner Bark* forms the major part of the drug, and consists of alternate rows of bast parenchyma and sieve tubes. The latter are usually obliterated towards the middle bark, and frequently yield lignin reactions. The sieve tubes are blunt pointed, and have very numerous and closely crowded sieve plates on their radial walls; the oil cells are generally smaller than those in the primary bark. Medullary rays usually one-, sometimes two-celled; occasionally these conditions are reversed; some are much enlarged near the middle bark. Cells normally radially elongated, assuming by compression an apparent tangential elongation, mostly containing a single rosette of calcium oxalate.

The secondary bark seldom contains cells with red contents insoluble in solution of potash. In characteristic canella barks with well-developed sclerenchymatous phelloderm the secondary bark never contains sclerenchymatous cells. In barks with imperfect phelloderm isolated sclerenchymatous cells are frequently found, varying in shape, but seldom acutely pointed. In these barks the obliteration of the sieve tubes is less marked.

This description will be observed to differ in several particulars from those previously published and accepted. That of Professor Moeller* may be reproduced as the most detailed.

"Periderm scraped off; phelloderm consists of several (up to six) rows of cubical stone-cells, the inner side of which is often thickened till the lumen nearly disappears, finely striated, with numerous branched pores. Cells of primary bark small, thin-walled, free from calcium oxalate, but containing numerous spherical or ellipsoidal oil cells with deep lemon-yellow contents. Secondary bark consists principally of sieve tubes, which, in the dry bark, are shrunk to tangential strands. The sieve tubes are long, interwoven, have numerous close sieve plates separated by narrow bars. Bast parenchyma, small cells with large pores. The secretion cells are thick-walled, smaller than those of the middle bark. Neither bast fibres nor sclerenchymatous cells are present in the bast. Medullary rays one-celled, enlarged towards middle bark, and here containing numerous oil cells. The cells are not elongated, and are the sole cells which contain calcium oxalate in the form of large rosettes."

The following are the principal differences that have been observed:—The periderm is not infrequently present, especially in young barks; the phelloderm may much exceed six rows of cells in thickness; oxalate of calcium is almost invariably present in the primary bark, sometimes in abundance, and may also occur exceptionally in the bast parenchyma. The pericycle always contains sclerenchymatous fibres (primary bast fibres), and sclerenchymatous cells occur exceptionally in the secondary bark. The cells of the medullary rays are normally radially elongated.

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* Moeller, 'Anatomie der Baumrinden,' p. 253.

These differences in detail, though apparently trifling, are sometimes sufficiently important, in identifying a bark, to warrant a certain stress being laid upon them.

The authors of 'Pharmacographia' (2nd ed., p. 74) can scarcely have alluded to the sclerenchymatous fibres (or cells) when they say that "the liber fibres show reticulated marks due to the peculiar character of the secondary deposits on their cell-walls;" this is rather a character of the sieve tubes. Nor are the "larges cellules fibreuses à parois épaisses" of Professor Planchon the sclerenchymatous cells described.

The simple presence or absence of sclerenchymatous cells in the secondary bast is therefore insufficient to distinguish a canella from a *Cinnamodendron*; they occur constantly in the latter, exceptionally in the former, and in both cases belong to the same type. But canella bark rarely contains in the secondary bark the cells filled with red resin, such as are always present in the bark of *Cinnamodendron corticosum.*

### Examination of Doubtful Specimens.

1. *Cinnamon Bark.*—A sample, sent by Mr. Moss, of bark offered at the drug sales. The sample consists of small pieces with, and larger without, a rough fissured periderm. Smaller pieces, when freed from periderm, have the appearance of canella; larger pieces have a rough, but not pitted exterior. Taste and odour as canella.

The structure of the smaller pieces corresponds to that of young canella bark. Sclerenchymatous fibres in the pericycle conspicuous. The larger pieces contain also sclerenchymatous cells in the secondary bark; in these pieces the sclerenchymatous phelloderm is much reduced; the oil cells and calcium oxalate, medullary rays and sieve tubes as in canella.

The bark is unquestionably that of *Canella alba.* Judging from its appearance, probably the waste left after picking over.

2. *Cortex Canellæ Spurius.*—A specimen sent to Daniel Hanbury by Dr. Martius.

A single curved piece, 5 in. by 1½, about $\frac{3}{16}$ in. thick. Inner surface nearly black. Outer surface dirty grey, hard, and pitted. Section yellowish with brown spots. Odour and taste resembling canella.

Phelloderm as in canella, but narrower, the outer cells showing very evident degradation, and covered in places with the finely granular, yellowish-brown powder resulting therefrom; hence the peculiar external appearance. Oil cells numerous, containing brownish-yellow resin (result of age). The dark colour of the inner surface is not uncommon in commercial canella bark. It is due to a darkening partly of the cell contents, partly of the cell wall. Medullary rays and sieve tubes as in canella. The conclusion to be drawn from these details is that the bark is a genuine *Canella alba.*

3. *Canella alba,* "*Guadeloupe.*"—Hanbury collection. Suspected to be *Cinnamodendron.* Portion of a trunk 3½ inches in diameter. Periderm greyish, furrowed, in places firmly adherent; bark about $\frac{1}{10}$th inch thick, pale, with yellowish oil cells. This bark has entirely the characters of canella. The specimen is certainly a portion of the trunk of *Canella alba.*

4. *Canella alba,* "*Chitty.*"—Hanbury collection. Labelled *C. corticosum* by Hanbury. The large number of bast fibres in the secondary bark and cells containing red amorphous matter insoluble in caustic potash indicate this to be a *Cinnamodendron.*

5. *Wild Cinnamon, Jamaica.*—Collection of the Imperial Institute.* Pale yellow pieces, 3¾ in. long, ¾ inch wide, $\frac{3}{16}$ inch thick, marked with an occasional brownish spot. Section under the lens pale, bast rays wavy, towards the middle bark darker in colour. Inner bark rather fibrous. This bark bears considerable resemblance to a smooth canella.

Phelloderm averages eight rows; middle bark contains numerous oil-cells, abundance of starch, calcium oxalate in rosettes, and numerous cells with red resin. The latter also present in secondary bark, which contains, in addition, numerous sclerenchymatous cells; medullary rays mostly one-celled, each cell with a rosette of calcium oxalate.

The large number of sclerenchymatous cells and the presence of red-resin cells in the secondary bark, together with a well-developed sclerenchymatous phelloderm, indicate this bark to be the produce of *Cinnamodendron corticosum.*

6. *Canella alba.*—From the Museum, Kew. Curved pieces of bark; periderm grey or yellowish grey, smooth, but interrupted by brown warts; the thin cork easily exfoliates, exposing a brown phelloderm. Under a lens the section shows a yellow phelloderm, reddish middle and pale inner bark.

The cork in this specimen consists of cells with brown thickened walls; the sclerenchymatous phelloderm is well developed, the middle bark contains large oil cells and numerous cells with red resin and calcium oxalate; flattened bast fibres are distributed through the bast rays in the inner bark. The warts consist of thin-walled phelloderm, with calcium oxalate.

This bark is derived from *Cinnamodendron corticosum.* In commercial bark the cork is seldom present, hence its unusual appearance.

### Summary.

The foregoing examination of canella barks from various sources shows that the structure of the bark is by no means so uniform as it has hitherto been considered. Notable variations have been demonstrated, and the occurrence of these variations is of importance, inasmuch as it is precisely those barks of more or less abnormal appearance that the histologist is called upon to identify. To ignore such variations is therefore to render the determination uncertain. Of special interest is the possible presence of both sclerenchymatous cells and cells with red resin, for both these elements have been regarded as specially characteristic of *Cinnamodendron corticosum.* In determining the identity of barks exhibiting either or both of these characters, caution must therefore be exercised.

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* Kindly forwarded by Dr. Cooke.

## STRUCTURE OF THE CELL IN FUNGI AND ALGÆ.

Herr W. Wahrlich states that he has found protoplasmic continuation between the cells in all fungi examined, with the single exception of *Oidium lactis*, not only between the vegetative cells of the hyphæ, but also between those of the asci and of the ascospores, and in some cases between the cells of multicellular spores. In all cases the septum exhibits a single central pore, traversed by a string of protoplasm of uniform breadth. The protoplasm of the string was frequently seen to be of a granular structure. The pore is not formed by resorption of a portion of the membrane, but exists from the first. This is especially well seen in young cultures of *Achorion Schönleinii*, and was also evident in cell-formation by budding. In a number of filiform algæ—*Spirogyra*, *Ulothrix*, *Oedogonium*, protoplasmic connection between the cells was also established.

With regard to the formation of the septum, this does not arise from a circular thickening of the side wall, gradually penetrating into the cell cavity; but a new membrane is formed round the protoplasmic body, apparently from its parietal utricle, and, as the protoplasm becomes constricted, this follows its contour until, when it finally divides, each daughter-cell becomes surrounded by its own layer of cellulose. The layers of which the membranes of filiform algæ are composed are so many special membranes which belong to the successive encapsuled generations of cells

From the absence of the protoplasmic connections in those fungi in which each cell is independently nourished, such as *Oidium*, and in some filiform algæ, the author concludes that they are the agents for the transport of food material, by means of which the granular protoplasm is conveyed from cell to cell. This was observed directly in *Eurotium repens*. (Paper in Russian; see *Botanisches Centralblatt*, lv., 1893 p. 368.)

## THE TANNIN OF TEA.

A. Hilger and Fr. Tretzel have studied the chemical characters of this constituent of tea, in regard to which very discordant accounts have been given by various authorities. In order to obtain a pure product, green tea was operated upon by first extracting with boiling water, evaporating the clear liquor to the consistence of a thin syrup, and then shaking with acetic ether which had been digested with magnesia. The ethereal solution containing tannin, together with chlorophyll and products of its alteration, was then distilled, the residue treated with water, and on evaporating the clear water solution the tannin was obtained perfectly free from ash. It presented the appearance of a chocolate brown powder, readily soluble in water, alcohol, acetone, or acetic ether, sparingly soluble in ether, and insoluble in chloroform. The water solution gives with ferric chloride a deep blue coloration, with gelatin solution a precipitate. Elementary analysis and the behaviour of the acetyl compound of this tannin show that it has the composition and general characters of an anhydride of digallic acid, and not those of a glucoside. By long continued action of dilute sulphuric acid, the tannin of tea is converted into gallic acid and a phlobaphen.—*Forsch. Ber. u. Lebensmittel*, 1893, p. 40.

## THE EDIBLE LICHEN OF JAPAN.

Dr. M. Miyoshi, of Tokio, describes in the *Botanisches Centralblatt* (vol. lvi., 1893, pp. 161–163) the edible lichen of Japan known as "iwatake," and names it *Gyrophora esculenta*, sp. nov. It owes its economical value to the large amount of starch and of a gelatinous substance which it contains. It has no bitter taste nor purgative properties. It is very abundant in some parts of Japan, growing especially on moist granite rocks in mountainous districts, which it frequently entirely covers. It is collected in large quantities by the mountaineers, dried, and sent into the towns, whence a considerable amount is exported. It is largely used as a condiment in Japanese cookery.

## A NOVEL METHOD FOR THE PRODUCTION OF NITRITES.

BY H. N. WARREN.

The surface, or catalytic, action which platinum exerts upon ammonia when in the presence of oxygen, with the production of the white cloud of ammonium nitrite is, when carefully performed, more than striking as regards the quantity of nitrite thus formed, but by employing a more energetic form of platinum the effects may be considerably enhanced.

The most powerful surface action that I have been successful in producing was obtained as follows:—Platinum was dissolved by the aid of aqua regia, evaporated to dryness, and the resulting platinic chloride thus formed maintained at a temperature of 400° F. as long as any chlorine continued to be evolved; the residue was now boiled with a slight excess of sodium carbonate, and the platinic hydrate thus produced dissolved by means of oxalic acid, the solution concentrated, and a sufficiency of asbestos yarn added to absorb the solution; the yarn, which now measured about a yard in length, when dried and ignited, contained about 12 per cent. of platinum, presenting a grey colour characteristic of that metal when in the spongy form, the asbestos meanwhile retaining its original ropy properties without becoming brittle, as is the case when platinum chloride is used in place of the oxalate. The so prepared asbestos was next introduced into a combustion tube somewhat longer than the same, and connected to an apparatus evolving ammonia gas, a current of air being at the same time injected into the apparatus in order to furnish a mixture of oxygen and ammonia; the action of the platinised asbestos was now started by applying the flame of a Bunsen burner to the more remote end of the tube. Directly the mixed gases are allowed to impinge upon the platinised surface, dense clouds of ammonium nitrite are formed, and in several instances the whole length of the asbestos became intensely heated. The ammonium nitrite thus formed was conveyed into a solution of caustic soda, producing thus an equivalent quantity of sodium nitrite, the ammonia thus evolved being retained for a further supply. Some idea as to the delicacy of this so prepared asbestos can be obtained when I mention that for several minutes, while the apparatus was in complete working order, scarcely any excess of ammonia could be detected at the further end of the tube, the whole of it being converted into nitrite.—*Invention.*

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, MARCH 24, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE PHARMACY ACT AND THE PUBLIC.

THE conditions under which various poisonous articles are obtainable have recently been the subject of frequent comment in the newspaper press, partly as a result of fatalities that have occurred, and partly in consequence of the prosecutions which have given rise to legal disputations as to the intention and meaning of the provisions of the Pharmacy Act, by which the sale of some of those articles is regulated. In most instances the opinions expressed have shown a more or less complete want of acquaintance with the existing law, and the suggestions offered as to means of protecting the public from danger have consequently had but little practical value. But apart from this defect there has been a very general agreement that it is desirable to render access to poisons so difficult as to prevent their misuse by would-be suicides or other persons having evil intentions. It has also been admitted that there is need for precautions being observed in the use of poisonous articles, either for technical or medicinal purposes, in order to avoid risk of accidental poisoning. In addition to the general agreement on these points it has been suggested that the use of poisonous substances for any of the purposes to which they are applied should be subjected to control of a much more stringent character than has ever yet been attempted in this country, even in regard to the sale of poisons.

In illustration of the tendency of such proposals reference may be made to some letters which have appeared in the *Leeds Mercury*. One of them, signed "A Sufferer," evidently written under the influence of strong feeling, speaks of the frequent occurrence of "death by misadventure"—the result of accidental poisoning—as being a "promiscuous hurrying into eternity" that is a source of sorrow, misery, and remorse to a multitude of innocent men and women. He brings a serious charge against those who are concerned in the use of poisonous articles, of not having been sufficiently cautious in keeping such articles out of reach by children and others, and in regard to those who supply poisons, he alleges that no effort has ever been made by them to protect the public. Over a similar signature the writer of another letter, who appears to be better acquainted with the law relating to the sale of poisons, declares that the law as it stands is ineffective, because it allows a limited company of unqualified persons to perform the functions nominally reserved to legally qualified chemists. As remedies for this and other abuses he suggests, among other things, that poison should not be sold or dispensed by any but qualified persons, and that no qualified person should keep more than one shop, the whole responsibility attaching to the supply of poisons resting upon the proprietor. These proposals are more reasonable than the censure poured out by the writer of the other letter, and it is by no means certain that their realisation might not be effected by the aid of the existing law. What is requisite for that purpose is the support of public opinion and the recognition of the fact that the Pharmacy Act, 1868, is especially a measure designed for the protection of the public. If the subject were inquired into from that point of view it would be found that considerable efforts have been made to provide for public safety, and that more stringent administration of the Pharmacy Act according to its intention would be the most effectual safeguard.

But we are glad to be able to refer to a letter from the president of the Leeds Chemists' Association in reply to those above mentioned, in which he points out that the provisions of the Pharmacy Act are sufficient to secure observance of all the mechanical safeguards capable of preventing accident, and of precautions adapted for preventing poisons being improperly obtained. He also points out the still more important fact that the Pharmacy Act, 1868, did not merely enact regulations for the distribution of poisons with mechanical safeguards. The chief feature of the Act was the provision that the sale of poisons should be restricted to persons who had previously submitted to an examination as to their competent knowledge and skill to deal with such articles. That is the only real safeguard against the danger of poison, and in order that the public might be informed as to the sources from which poisons could be procured under proper conditions, it was enacted that a register of the persons authorised to deal in poisons should be kept. As Mr. REYNOLDS remarks, the Act has by no means fallen into abeyance. The Boards of Examiners sitting in London and Edinburgh exercise their functions in the public interest by granting qualification to carry on business only to those who prove their fitness. The articles technically comprised within the meaning of the Act as poisons are limited in number, but they can be added to as occasion may require. Recommendations having that object have been made in regard to various articles, but the Government Department, whose sanction is requisite, has objected on the ground that the articles proposed to be added to the list of legal poisons are largely used in the arts, and it was thought any restriction of their sale might cause inconvenience. Carbolic acid is one of the articles recommended to be made a poison within the meaning of the Act, but it is still doubtful whether the recommendation will be approved unless a strong expression of opinion should be brought to bear upon the authorities on the part of the public.

### THE ANNUAL DINNER.

We are asked to announce that a first list of stewards, in connection with the annual dinner of the members of the Pharmaceutical Society and their friends, will be published in the advertising columns of next week's Journal. Gentlemen desirous of acting in that capacity, who have not yet sent in their names to the Honorary Secretary, Mr. Richard Bremridge, 17, Bloomsbury Square, are requested therefore to do so at once.

### PHARMACY LAW IN SCOTLAND.

The appeal case of Tomlinson *v.* Bremridge, partly argued on March 5 (see *ante*, p. 760), and adjourned for debate before a full bench of judges, was heard in the High Court of Justiciary, Edinburgh, before the Lord President, the Lord Justice-Clerk, Lord Adam, Lord Kincairney, Lord Kyllachy, and Lord Stormonth-Darling, on Monday, March 19. The case having been stated and replied to for the appellant and respondent respectively, after a brief consultation the Lord President intimated that the court would consider the arguments before giving judgment, and the case was then adjourned. The opening statements of counsel will be found reported in full in the present issue of the Journal, and the speeches in reply will be published next week, but judgment will not be given for some time, as the court will not assemble again, after the recess, until May 12.

### EVENING MEETING IN EDINBURGH.

An evening meeting of the Society will be held in the Society's House, 36, York Place, Edinburgh, on Wednesday next, March 28, at 8.30, when the chair will be taken by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch. The following communications will be read: "Some Notes on Papain Digestion," by Dr. S. Rideal; "Note on Opium Assay," by D. B. Dott; "Note on a Viscosimeter," by D. B. Dott; "The Method of preparing Certain Ointments," by Peter Boa; and "Glucose as a Preservative of Ferrous Iodide Syrup," by William Lyon. Subsequently, it is proposed to continue the adjourned discussion on the United States Pharmacopœia of 1890.

### PRESENTATION TO MR. W. D. SAVAGE.

On Wednesday, March 14, Mr. W. D. Savage, J.P., was the recipient of an illuminated address, presented by the members of the Brighton Associations of Pharmacy. Mr. Savage has occupied the position of president of the senior association for twenty-one years, and has been honorary president of the junior association for a similarly long period. Advancing years having compelled him to retire from these offices, it was decided that his long services should be recognised in fitting form and, in Mr. Savage's absence, the presentation was duly made to his son, Mr. W. W. Savage, at the Clarence Rooms, the address being handed over by Mr. W. H. Gibson, president of the Brighton Association of Pharmacy. In the address Mr. Savage was assured that he carried with him the united regard and esteem of all who had benefited by his labours, and the donors expressed high appreciation of the value of those labours, whether undertaken in the interest of the associations or of the profession of which he was an honoured member, or of the town in which he occupied so exalted a position. They further trusted that he might long be spared to enjoy in retirement the repose so well and ably earned.

### THE LATE R. H. DAVIES.

We understand that the widow and sons of the late Mr. Davies have been left in somewhat straightened circumstances, and that a committee, consisting of the following members, has been formed for the purpose of raising a fund for their assistance:—Professor Armstrong, President of the Chemical Society; Mr. Michael Carteighe, President of the Pharmaceutical Society; Sir Charles A. Cameron, President of the Society of Public Analysts; Mr. Otto Hehner, Vice-President of the Society of Public Analysts; Mr. N. H. Martin, President of the Pharmaceutical Conference; Mr. E. C. C. Stanford, President of the Society of Chemical Industry; Dr. Russell, President of the Institute of Chemistry; Professor Tilden, Vice-President of the Institute of Chemistry; Mr. E. J. Bevan, Hon. Sec. Society of Public Analysts; Dr. Bernard Dyer, Hon. Sec. Society of Public Analysts. Subscriptions will be gratefully received by any member of the Committee, or by the Honorary Secretary, Mr. William Chattaway, Apothecaries' Hall, Blackfriars, E.C.

### CONGRESS OF PHARMACY AT NAPLES.

It is announced that the fourth Italian Congress of Pharmacy and Chemistry will be held at Naples, from September 2 to September 7 next, scientific and professional matters being dealt with in distinct sections.

# Transactions of the Pharmaceutical Society.

## SCHOOL OF PHARMACY EXAMINATION QUESTIONS.

*Session* 1893-94.—*Winter Course.*

### PRACTICAL CHEMISTRY.

PROFESSOR ATTFIELD.

*Monday, March* 19 —*Hours from* 10 *a.m. to* 1 *p.m.*

[*Books and Memoranda are permitted. Manipulation as well as results will be scrutinised. While avoiding hurry, economise time, and report results as soon as they are all obtained.*]

Report, qualitatively, on the purity of—

1. The sulphur.
2. The iodine.
3. The rectified spirit.

Name the single substances marked, respectively, X, Y, Z; disregarding slight impurities.

### MATERIA MEDICA.

PROFESSOR GREENISH.

*Monday, March* 19.—*Hours from* 2 *to* 5 *p.m.*

[*Four questions only to be attempted.*]

Write as complete and concise accounts as you can of the following drugs:—

1.—(*a*) Ergot; (*b*) Araroba.
2.—(*a*) Cantharides; (*b*) Storax.
3.—(*a*) Cochineal; (*b*) Wool-fat.
4.—(*a*) Mezereon bark; (*b*) Copaiba.
5.—(*a*) Santonica; (*b*) Aloes.
6.—(*a*) Male Fern; (*b*) Benzoin.

### CHEMISTRY.

PROFESSOR DUNSTAN.

*Tuesday, March* 20.—*Hours from* 10 *a.m. to* 1 *p.m.*

[*Any four of these questions may be attempted, but not more than four. Wherever possible chemical changes should be represented by equations*].

1. Explain the mode of action of the chief methods of producing low temperatures? How are such temperatures ascertained?

2. Describe and explain the effect of nitric acid on the following substances:—sulphur, phosphorus, antimony, arsenic, tin, and zinc.

3. Describe the principal methods of obtaining aluminium. In what respects does aluminium resemble boron and iron?

4. Give an account of the process of silver electroplating.

5. Explain the action of hydrochloric acid on calcium hypochlorite. What volume of chlorine at 15° C and 757 mm. would be produced by this change from half a kilo. of the salt?

6. Show how the following compounds may be prepared from alcohol:—chloral, chloroform, iodoform and ethyl acetate.

### BOTANY.

PROFESSOR GREEN.

*Prize Examination.*

*Tuesday, March* 20.—*Hours from* 2 *to* 5 *p.m.*

[*Only four questions to be answered*].

1. Describe the structure of the nucleus in an ordinary vegetable cell. How does the nucleus behave in the process of cell division?

2 Give an account of the processes which lead up to the appearance of starch in the leaves of a plant. Under what conditions does starch normally occur there?

3. Compare the stem and root of a phanerogam with regard to:—

$\alpha$ The protection of the apex.
$\beta$ The distribution of bast and wood.
$\gamma$ The mode of thickening.

4. Describe the chief varieties of hair found upon the sub-ærial parts of green plants.

5. Give a short account of the influence of light upon growth.

6. Give a concise account of the life history of a fern.

### PRACTICAL BOTANY.

PROFESSOR GREEN.

*Wednesday, March* 21.—*Hours from* 10 *a.m. to* 1 *p.m.*

1. Make microscope preparations to show the structure of specimen A. Identify it, and leave lettered sketches of your preparations.

2. Identify the microscopic preparations B, C, D.

3. Comment on the morphology of E, F, G.

### PHARMACY AND PRACTICAL PHARMACY.

MR. INCE.

*Wednesday, March* 21.—*Hours from* 2 *to* 5 *p.m.*

[*Four questions only to be attempted*].

1. Discuss the keeping property of infusions, the nature of certain deposits formed, and suggest methods of preservation.

2. Make unguentum conii, and mention some dispensing applications of adeps lanæ hydrosus.

3. Give sp. gr. of acidum hydrocyanicum dilutum, chloroform, liquor potassæ, spiritus ætheris nitrosi, and spiritus tenuior. Also melting points of adeps præparatus, paraffinum durum, paraffinum molle, oleum theobromatis, and menthol.

4. Describe various methods of making ($\alpha$) oleum ricini; ($\beta$) oleum terebinthinæ, into an emulsion.

5. Comment on official syrupi which involve chemical action.

6. Explain, with illustrations, the meaning of percentage solutions.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Glasgow Appeal Case.

The appeal case, Tomlinson *v.* Bremridge, was heard in the High Court of Justiciary, before the Lord Justice-General, Lord Justice-Clerk, and Lords Adam, Kyllachy, Kincairney, and Stormonth-Darling, on Monday, March 19, 1894.

Counsel for the appellant, Mr. Guthrie and Mr. Ure. Agents—Simpson and Marwick, W.S.

Counsel for respondent, Mr. Salvesen and Mr. T. B. Morison. Agent—P. Morison, S.S.C.

*Counsel for the Appellant.*

Mr. Ure: My Lords, the question raised in this appeal is whether the leading provisions of the Pharmacy Act are designed to strike at the unqualified trader or at the unqualified salesman, shopkeeper, or servant of the trader; and it is raised under these circumstances. In the month of July last, on two separate occasions, the appellant, who is a salesman in the employment of a medical practitioner in Glasgow, sold poison to a purchaser—oxalic acid in the one instance, and prussic acid in the other—he, the salesman, not being qualified under the Pharmacy Acts, although his master was. A complaint was presented against the salesman under the Statute. The Sheriff convicted, and the question is whether or not that conviction ought to stand, and I understand that this hearing has been appointed because it was intimated at the hearing in the Justiciary Court when the case first came up that there was a decision directly adverse to the contention of the appellant in the Divisional Court of Queen's Bench in England. Now we maintain upon the Statute—on a just construction of the Statute—that the conviction is bad; that these provisions were obviously designed to strike at the trader, and not at the trader's servant. Secondly, we maintain that upon decisions pronounced under similar Acts of Parliament the same result is reached; and, thirdly, I hope to be able to show that the argument upon the Statute, which we submit was not fully before the courts in England, and that the decision of the Divisional Court was wrong. I ought to add that there are expressions of opinion in the House of Lords in a case not identical with the present, but certainly upon a construction of this Act, which likewise lead to a conclusion adverse to the appellant. Now, my lord, the Statute in question is the 31 and 32 Vict. c. 121, and we found in the first place upon the preamble of the Statute; in the second place upon the precise terms in which the first and 15th sections founded on are expressed; and in the third place upon the expressions in the 17th section of the Statute. Prior to the passing of the Act of 1868 there was only one statutory provision in force dealing with this matter—the Pharmacy Act of 1852, to which I ought to advert—15 and 16 Vict. c. 56, which provided in general this, that no one could claim and use the title of pharmaceutical chemist or pharmaceutist unless he was registered under that Act, unless he passed the examination and paid the fees which are therein prescribed; but still it was left open to any one to open shop and sell poisons and other drugs without any statutory provision being applicable to his case until the Statute of 1868. Keeping in view that any one might sell drugs and poisons, I submit that the preamble of the Statute in question is very important as showing precisely the mischief intended to be remedied by the new Act. "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business, and to that end, and from and after the day herein named, all persons not already engaged in such business should, before commencing such business, be duly examined as to their practical knowledge, and that a register should be kept as herein provided . . . . . be it enacted, etc." Now, observe, in the first place, the Statute announces that the safety of the public is to be secured by ensuring that persons keeping open shop for the retailing, dispensing, and compounding of poisons, and persons known as chemists and druggists, should, before commencing business, be duly qualified, and that they should be examined as to their practical knowledge of their business before commencing. Obviously that preamble is met and fully satisfied by statutory provisions directed against traders. Obviously it was not the intention of the legislature to strike at any but the trader, the seller in the sense of the man who controls, directs, and manages the sales, and there is nothing, therefore, to indicate any intention to strike at the subordinates, the menials, in the employment of the man who trades. It is the keeping open shop and the qualification before starting business that are announced as the things that are to be met by the Statute. Well, the first section is, "From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title chemist and druggist, or chemist or druggist, or pharmacist, or dispensing chemist, or druggist, in any part of Great Britain, unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing, and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society." It is said by the respondent that that provision of the Act strikes at the seller in the sense not of the man who controls the sale, not the man who makes the contract of sale, but the hand which hands over the article sold from the seller to the buyer, and also strikes at the man who keeps open shop. The words are, "It shall be unlawful for any person to sell or keep open shop for retailing," and so on. Now, we submit that that is an unnatural and forced construction of the words. It is not consonant with the provision of the preamble; it is not consonant with the interpretation put upon the words in any other Statute, or put upon the words in the ordinary phraseology of the law. The man who sells is the man who makes the contract of sale, and not the man who merely hands over the article, and the two alternatives are sufficiently met by placing this interpretation upon them, that the trader who keeps open shop for the sale of poisons, for compounding and selling drugs which fall within the prohibited category, shall be struck at by the Act, even although the prosecutor is not able to prove a particular instance in which the sale has been effected—it shall be sufficient for him if he proves that open shop is kept. At the same time he shall be entitled to a conviction if he can prove an individual, separate, and distinct sale—and accordingly sales are in that sense struck at—that he shall not be prevented from securing a conviction, even though he goes no further than to show that the shop has been kept open; then, that the person who keeps open shop is the same person, it is the trader acting in one or other of two capacities, either making the transaction or keeping open shop where the transaction can be made, and it is not necessary, therefore, and is indeed contrary to the plain intent of the Act, to enlarge the expression “sell,” so as to include the hands which pass the article from the trader to the customer. The 15th section is the other section which is founded on: “From and after the 31st day of December, 1868, any person who shall sell or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist,” etc., shall be subject to a penalty. In short, you find in the 15th section precisely the same phraseology employed that you find in the first, and it is dedicated merely to setting forth the penalty and the mode of prosecution. Now upon the ordinary construction of these words we submit that it is the man who controls, and not the man who hands over, that is struck at. That construction is aided, and is not militated against, by the 17th section, which is the only other section upon which argument can be heard. The 17th section is one which prescribes regulations to be observed when poisons are sold. “It shall be unlawful to sell any poison either by wholesale or by retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained, be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any poison of those which are in the first part of schedule (A) to this Act, . . . . . to any person unknown to the seller, unless introduced by some person known to the seller;” and then: “On every sale of any such article the seller shall, before delivery, make or cause to be made an entry in a book to be kept for that purpose, stating . . . . . the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required.” Now the word “sell” and the word “seller” occur frequently in these clauses I have read. There comes an interpretation to be put upon the word “seller” in the words I am now going to read: “for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller.” It is said that this interpretation of the word “seller” is limited exclusively to the regulation set forth in section 17, and that this limited interpretation is plainly confined to section 17, because the words are that the limited interpretation is to be placed on the word “seller” for the purpose of this section. Now, in answer, we say that this explanation was only introduced for greater clearness, to make it quite apparent that in dealing with this particular matter of the regulations as to the sale of poisons it was the trader that was to be struck at. But we say we find in this very clause, in this interpretation, if I may so say, an indication that the Act contemplated sales being made of poisons, under other conditions, by servants, unqualified servants, or by apprentices, because your Lordships will see the words are “for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller,” showing that it was contemplated that in the ordinary case the apprentice or the servant might actually carry through the transaction as the hand of the seller or the trader, and that it was only in this particular instance that the active intervention of the trader himself was to be invoked. Now, it might be said that “servant” may mean qualified servant. Well, it is odd that the Act should not have said so if it meant it, because it would have been easy to say “by any apprentice or qualified servant,” but even though that should be doubtful, even though it should be open to be said that “servant” there means qualified servant, someone who has complied with the provisions of the Act, that argument is not open when you use the word “apprentice,” because apparently an apprentice is a man who is in course of being qualified, and therefore the Statute contemplates the sale by a person, a servant, or subordinate, who cannot possibly be qualified in the sense of the Act, who is only in course of being qualified, and who, therefore, would be committing an offence if the contention maintained by the respondent here is sound. I do not think the other clauses of the Act have any direct bearing upon the question at issue, except, indeed, the clause which relates to apothecaries—I mean clause 16—and I shall state in a sentence the argument we found upon it. Clause 16 provides that “Nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary or of any member of the Royal College of Veterinary Surgeons of Great Britain,” etc. It is important to notice that it is a legally qualified apothecary whose business is not to be interfered with in any way by the provisions of this Act. A legally qualified apothecary therefore, we say, may, it is quite plain, employ under him as his hand for carrying on his business persons who have not qualified under the provisions of this Act, because otherwise his business would be interfered with. He would be compelled in carrying on his ordinary business to make quite certain that he had amongst his subordinates persons who were duly qualified under the Statute. That would be interfering with his business. Now, the appellant's master here was not an apothecary—he was a medical practitioner. That appears on the facts set forth in the case at the foot of page 4: “2nd. That the shop, 133, West Scotland Street, where the poisons in question were dispensed, belongs to Dr. Hugh Kelly, who is a properly qualified and registered medical practitioner, and also a properly qualified and registered chemist and druggist.” Now there was passed in the year which followed this Statute, in 1869, an amending Act, 32 and 33 Vict., c. 117, which extends the exemptions of the Act to legally qualified medical practitioners in these terms: “Nothing contained in the first fifteen sections of the recited Act shall affect any person who has been registered as a legally qualified medical practitioner before the passing of this Act; and the said clauses shall not apply to any person who may hereafter be registered as a legally qualified practitioner, and who, in order to obtain his diploma for such registration, shall have passed an examination in pharmacy.” The appellant's master fell within the category of legally qualified medical practitioners, whose business, therefore, to use the words of this section, was not to be affected by anything contained in the first fifteen sections of the Act of 1868. Well, we say that the ordinary business of the medical practitioner is carried on, in many places in Scotland, at all events, not only by visiting outpatients, but also by keeping a drug shop, and that it would seriously affect his business if he were compelled—and has been compelled, if the respondent is right, since 1868—to employ none but qualified assistants in the sense of that Act, who may dispense poisons or medicines in his absence; that, in short, the medical practitioner who keeps a drug shop is necessarily, in the prosecution of his calling, frequently away from his shop, and that he has hitherto employed persons not qualified in the sense of the Act, and therefore the Act would seriously interfere with his business if henceforth he is to employ none but persons qualified under the provisions of the Act, and that the object of the legislature would be well served, and the safety of the public effected, by ensuring that you have a medical practitioner at the head of the concern, because he presumably would know the dangers of the careless dispensation of poisons, and would so arrange his shop and ensure the qualification of his servant—though not necessarily the qualification under this Act—as to preclude any danger. In short, the safety of the public is sufficiently met by ensuring that the head of the establishment is a duly qualified medical practitioner. That, my Lords, is the argument upon the terms of the Statute itself. There have been, my Lords, four decisions pronounced under this Act, three in England and one in Scotland. The earliest English decision was pronounced in 1880, in the case of the Pharmaceutical Society *v.* The London and Provincial Supply Association, House of Lords, 5 Appeal Cases, 857. The reference to the decisions in the Divisional Court and in the Court of Appeal are 4 Q. B. Div. 313, and 5 Q. B. Div. 310. I only propose to direct your lordship's attention to the House of Lords' judgment. The question raised in that case was this—whether a joint stock company or corporation could be guilty of an offence under the Act. The prosecution was brought against a limited company which carried on business as chemists and druggists for contravention of the Statute. They had in their premises a person who supervised sales and who held a qualification under the Statute, but none of the members of the company were qualified, and the corporation of course could not be. The question was whether the word "person," as used in the first fourteen or fifteen sections of the Act, included a corporation. The Divisional Court—Chief Justice Cockburn and Mr. Justice Mellor—held that "person" did include "corporation." That judgment was reversed in the Court of Appeal, and the judgment of the Court of Appeal was sustained in the House of Lords. It was not necessary, in deciding the question at issue there, to decide the question now before your Lordships, but it is vain to deny that in giving judgment Lord Selborne very clearly dealt with the question which is now before the court, and dealt with it adversely to the appellant. The passage to which I refer is on p. 865, where Lord Selborne says, "I have now to consider the main argument of the appellants." [Reads]. "Namely, that the Act will fail to accomplish its purpose unless a corporation as well as an individual can be included in these sections. It seems to me, my Lords, that this argument cannot be successfully maintained. The act of selling, the act of compounding, and every other definite and particular act mentioned in section 1, and in the sections by which penalties are imposed, are struck at, whether the person who does them is a principal to whom the business belongs, or anyone whom he employs to carry on the business. The words 'keep open shop' may perhaps not be so; upon those words I will make an observation presently. But the word 'sell' is, and that the word 'compound' also is seems to me clear from that very clause in section 17 which I just now read: that 'for the purposes of this section, the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller.' That, if it does not necessarily mean, beyond all doubt naturally implies, that this is a special construction for the purpose of that particular section, and that it is not to be extended to sales generally, when mentioned in other sections of the Act. I will add that regard to the mischief which, beyond all controversy, the Act was intended to prevent, leads necessarily to the same conclusion; namely, that he who sells, whether he be master or servant, whether he be the principal or a person to whom the conduct and management of sales is delegated, is struck at by section 15; because, otherwise, a very wide door would be opened to the evils which the Act was intended to guard against. If it were otherwise, nothing more would be necessary, according to the appellant's own argument, than that the business should belong to a person who does not himself carry it on, but who is qualified under the Act; and he might be at liberty to employ in the management of his business persons not qualified, by whom the actual sales would be conducted, and then the public would be exposed to all the dangers which the Act was passed to prevent. The Statute, therefore, in order to be effectual, must strike at the particular acts of those who actually conduct the sales, who actually compound the medicines, and it does strike at those acts. No doubt the words 'keep open shop' may extend to something more, and comprehend a person who keeps an open shop for the sale of poison, etc., although he may not with his own hands do the business of selling or compounding medicines; one who is only the master or proprietor of the business, if he indeed be a 'person' within the proper construction of the words of the Act." Now, your Lordships will notice that, high as Lord Selborne's authority is, there appears to have been overlooked in his Lordship's judgment—and I think it was overlooked in the argument presented—in the first place, the proper and just construction of the preamble of the Act; in the second place, that "sell or keep open shop" really indicated it was the trader that was being struck at—the man who controlled the sales and the man who had the control of the business—and that the mischief intended to be remedied, in so far as that can be gathered from the preamble of the Act, was not the actual handing over by unqualified persons of poisons or dangerous drugs, but the carrying on of business by people who were unqualified, the opening shop and starting of business by persons who had not a practical training, and who had not evidenced their capacity by submitting themselves to examination. And upon the 17th section there does not seem to have been pointed out—it certainly is not adverted to either in the judgment or in the argument—that the Act does contemplate sales by apprentices and by servants who, according to our submission, must be unqualified, both the apprentice and the servant, under the Statute. I pray in aid of the appellant's case, however, a passage which you will find at the top of p. 867, in the same judgment, where Lord Selborne says, "I said at the beginning that I did not regard this matter as free from difficulty, but in such a question of construction it does seem to me to be best to remember the principle that the liberty of the subject ought not to be held to be abridged any further than the words of the Statute, construed with a proper regard to its objects, may require." If I am right in the view which I present upon the preamble of the Statute, and if I am right upon the combined effect of the 16th section of the Statute and the amending Act of 1869, then it is plain that the rights of the medical practitioner, the duly qualified medical practitioner, will be seriously abridged by the construction sought to be put upon this Act by the respondent. I do not detain you by reading any portion from the other judgments delivered,—the court consisted of Lord Blackburn, Lord Watson, and Lord Selborne,—because there is nothing so clear and so distinct upon the question now before the court as those passages which I have just read. But the judgment, which I freely allow is directly adverse to my present contention, was pronounced in the case of the Pharmaceutical Society *v.* Wheeldon in 1890, 24 Q. B. Div. 683. The question there was almost identical with the present. The only difference, so far as I can see, is that the unqualified person there was not the servant of a duly qualified medical practitioner, but the servant of a chemist and druggist, and therefore that portion of my argument which rests upon the combined effect of the 16th section of the Act and the amending Act of 1869 is not touched by this particular judgment; but that is the only distinction I can point out between that decision and the present case. The court consisted of Mr. Justice Hawkins and Mr. Baron Pollock, and the reasoning upon which the judgment proceeded after a review of the various sections of the Act, will be found on p. 688 of the report. “It was contended on behalf of the appellant that it was not unlawful, under section 15, for an unqualified assistant of a duly qualified chemist to sell poison in his ‘master's’ shop in the ordinary course of his master's business; that the sale by the appellant being a mere sale by him as a servant in the discharge of his duty, the master was in law and in fact the seller, and that as the master was qualified the sale was lawful.” Then his Lordship deals with the argument that the qualified trader may be trusted to select a qualified assistant—qualified, I mean, in respect of care and judgment and intelligence, not qualified in the sense of the provisions of the Statute—and he comes to the conclusion that no such range of choice was left to the qualified trader, and that he must select as his assistant one who was qualified in terms of the Act. Now, the observation I make upon the reasoning is that it obviously proceeds upon an entirely wrong view of the preamble of the Statute and upon an entirely wrong view of the precise object which the legislature had before it when the Statute of 1868 was passed. It may have been very desirable in the interests of the public, and to ensure the safety of the public, that every man who handled poisons, compounded them, and dispensed them should be a qualified person, but that is not announced as the object of the Statute, and we submit is not within the fair meaning of the words of the first and the 15th sections. Then at the foot of p. 689, Mr. Justice Hawkins deals with the argument on the 17th section thus:—“The language of the 17th section fortifies us in the view we have taken, for in that section the legislature, where it intended that the person on whose behalf a sale is effected shall be deemed the seller, has said so in express terms.” And there again you will notice that in considering the effect of the 17th section, the learned judge failed to notice the qualifying circumstances I have drawn your attention to. There is one other decision in the English Courts to which I shall refer,—the case of Templeman v. Trafford, 8 Q. B. Div. 396. The question was there raised under the 17th section of the Act. It was this, whether a trader when he sold one of the poisons included within the category in the schedule appended to the Act was bound to put on his own name, or whether it was sufficient compliance with the provisions of the Act if he left on the poison the name of the trader from whom he himself bought. The Divisional Court—Mr. Justice Grove and Mr. Justice Lopes—held that compliance with the Statute was not made unless the trader who effected the sale placed his own name and address upon the label. Your Lordships will see at once that the question was not the same as that now presented; but I gather from the opinion of Mr. Justice Grove that he put upon this Statute the construction for which I am now contending, because in his judgment (p. 401) he says, “Light is thrown on the construction of sec. 17 by sec. 15,” which enacts that any person selling or keeping open a shop for retailing, dispensing, or compounding of poisons, not being a duly registered person, shall be subject to certain penalties. The word “sell” there is, in one sense, contradistinguished from the words “keep open shop,” and so possibly may apply to sales which are not in open shop. But the penalties may seem to be imposed on the person who conducts the business either of the shop or of the actual selling, and I think the same construction must be put on section 17, which provides that the box, or wrapper, or cover of the packet containing the poison, shall be distinctly labelled with the name of the article, the word “poison,” and the name and address of the “seller.”

Lord Justice-Clerk: That would come to this, that in this case if the assistant who sold put his own name on the label, the master would have been liable in the penalty under the Act.

Mr. Ure: It would.

Lord Justice-Clerk: On the footing that he was the seller, whereas the seller in the act of selling would be convicted under the decision of Mr. Justice Hawkins.

Mr. Ure: Yes, but I think your Lordship will see that Justice Grove, in expressing his view of the intention of the Act, expressed precisely the terms I submit, that the protection contemplated is that the person who controls the sale of poison shall be a duly qualified person, so that the public shall have remedy against him, and that he shall be responsible for the state of the poisonous preparation, labels, and so forth. As regards the judgment of Mr. Justice Lopes, I do think he must be held to have entertained precisely the same view of the scope and intent of this enactment, because he says, “It seems clear that “the word ‘seller’ as used in the 17th section means the person keeping or controlling the shop,” &c.—that is to say, the general policy of the Act is consonant and harmonious with the meaning put upon the word “seller” in section 17.

Lord Adam: If under section 17 and under that section alone the master is to be deemed the seller, though the article is sold by another party, that, you say, does not apply to section 1. Therefore under section 1 a sale by an apprentice would not be a sale by the master, and the master would not be liable. Then is there no seller?

Mr. Ure: The apprentice is not the seller.

Lord Adam: That is just the question under section 1.

Mr. Ure: The apprentice is not the seller; he makes no contract of sale. Of course that involves the construction of the word “sale,” and I say the word “sale” has never been interpreted in that narrow sense in any Statute or in any legal phraseology.

Lord Adam: I am saying nothing about that, I am only saying, upon your argument, reading sections 1 and 17 together, the result is that under section 1 there is nobody liable.

Mr. Ure: That is so.

Lord Kyllachy: How does that happen?

Mr. Ure: Under section 1 nobody is liable in this case, because there is a qualified person who has the shop. My answer to section 1 is that I am completely protected, because the leader is qualified in the sense of the Act. That he was the seller in legal phraseology and in statutory phraseology I submit also. The seller was qualified, and therefore protected.

Lord Justice-Clerk: The reason your client is convicted here is because he sold, and they say that as there is a special provision in section 17 applicable to what is done under section 17, that does not apply under section 1. That is the contention against you, and therefore in the one case you are the seller, and in the other you are not, but you may do the same acts by both.

Lord Kyllachy: Is there not a difference between making a sale and taking part in executing a sale?

Mr. Ure: There is a distinction, but none such is suggested in the Statute.

Lord Kyllachy: Does the Statute apply to persons taking part in executing a sale?

Mr. Ure: I think it does not in any part of it, and that you would require substantially distinct phraseology to strike at the person who takes part in effecting the contract.

Lord Kyllachy: I do not say “effecting the contract.”

Mr. Ure: In executing the contract. I say it is the man who makes the contract,—in short, the seller in the strict legal sense—and him alone, that the stroke is directed against, and you never can say the hand of the servant or apprentice is the seller, unless it was made clear, and it could be made clear in the preamble and enacting words.

Lord Justice-Clerk: Section 17 is palpably to prevent the master riding off with, "Oh, I instructed my servant always to put a label on, and in that I did all I could be expected to do." "No," they say; "you must make sure of that; you are responsible that it shall be done." It is a specific thing that is to be done under section 17; it is not the sale at all.

Mr. Ure: And the master is to be present in doing it.

Lord Justice-Clerk: The sale is merely what gives effect to the act in bringing it about if the thing is sold without a proper label upon it, and in that case it says the master is to be responsible, whether the failure is by himself personally or by anybody else.

Lord Kincairney: Don't you say that under section 17 it is lawful for an unqualified person to do the act of handing over a poison?

Mr. Ure: I think it is.

Lord Kincairney: It seems odd that it should not be permissible to hand over a less noxious article.

Mr. Ure: Yes, it is very odd. All that section 17 prescribes is that the master must be present and do the thing there prescribed with his own hand.

Lord Kyllachy: Or be responsible for it.

Lord Adam: In the case of the milder poisons which Lord Kincairney suggests, leaving out one view of the Statute, the Act does not think it necessary to make the master liable; but when you come to the more virulent poisons therefore the clause in section 17 is introduced. You are still within the Act.

Lord Justice-Clerk: But according to the interpretation against you, it is necessary No. 1 should be done by a qualified person, and if it is done by a qualified person there is no offence.

Mr. Ure: No. If it must be done by a qualified person, it does not signify whether the trader is qualified or not; the thing is to ensure that the person who hands over is qualified.

Lord Justice-Clerk: Now, section 17 contemplates that the handing over may not be by a qualified person, but under section 1 he is not to be punished, but the unqualified practitioner is to be punished.

Mr. Ure: It is obvious section 1 contemplates that the handing over is to be done by a person who has no qualification under the Act at all.

Lord Justice-Clerk: It is plain, if it is illegal for an unqualified person to hand over, it is a wrong thing for the owner of the shop to allow it to be regularly done, and it is a very curious thing that he should not be really the responsible person. The assistant does what he is ordered to do.

Mr. Ure: But that is the result of the respondent's contention, and it is said—of course on the authorities I have just cited—that the public will have no protection under the Statute at all unless the view which is now presented by the respondent is sound. Well, that eventuality is contemplated in the Scotch case which I am now going to cite,—the only case upon the question. That is Bremridge *v.* Gray, July 20, 1887,—14, Rettie, Justiciary Cases, 60. The Society having failed to secure a conviction in England against a corporation sought in this case to bring the individual corporators into court, and a prosecution was brought against the Leith Depôt, Limited, who carried on business as chemists and druggists,—not against them in their own name, but against the individual members of the company, a company incorporated under the Companies' Acts, and the Sheriff convicted. The court set aside the conviction, and did so mainly upon the authority of the House of Lords' case which I have cited,—the London and Provincial Supply Association; but I gather from the opinion of Lord Moncreiff at all events that in his view corporations and corporators were clearly outside the Statute altogether. They had been overlooked entirely when the Statute was framed, and from his point of view no conviction could be secured against either the one or the other, even though they did not employ qualified assistants in actually executing a sale. In the case before the court a qualified assistant was in the shop. Lord Moncreiff says, "The Act is very defective, and the state of facts disclosed in this case is simply not provided for," etc. And at the foot of p. 67, in Lord Young's opinion, you will find the question dealt with. "The public interest is entirely protected by the provision that, if this business is carried on in any shape, it shall be conducted, the drugs shall be compounded and dispensed, and everything in which the safety of the public is concerned shall be done, by duly qualified individuals," etc. Now, I do not gather that Lord Young or the Lord Justice-Clerk, or Lord Craighill, who constituted the court, expressed any opinions upon this question. In so far as any opinion was expressed by the Lord Justice-Clerk, it was adverse, I think, to the respondent's present contention, and all that Lord Young says is that there would have been a very great difficulty in prosecuting an unqualified assistant had it not been for the House of Lords' judgment; but he does not go on to say—and it was not necessary the court should there say—whether they approved of the *obiter dicta* in the House of Lords' judgment, the reasoning of Lord Selborne to which I have directed attention. Lord Young says he thinks that would have been a difficulty, and he says that question has been apparently decided. I submit it was not decided. It was not necessary for the decision of the case, on the reasoning I have already given. I will now briefly advert to other Statutes which have been judicially construed in the sense, I submit, for which I am at present contending. It is hardly necessary to say that in prosecutions under the Sale of Food and Drugs Act, the Petroleum Act, and so forth, the seller has never been held to be the man who actually handed over the article. The only person who has ever been sought to be prosecuted under precisely similar language in a statutory enactment to that now before the court has been the trader himself, and the man who actually made the sale—that is to say, the person who handed over the commodity—has been the principal witness in the case. The question therefore has never been raised, because nobody has ever doubted it was the trader and not the trader's subordinate who was struck at by the Statute, the word used being simply "sell,"—who shall sell a certain commodity adulterated, or with foreign ingredients mixed. But under the Salmon Fisheries Act a precisely similar question arose, and was decided by Lord Young at the Dumfries Circuit last year—Kerr *v.* Phyn, March 21, 1893, 20, Rettie, Justiciary Cases, 60. The prosecution was there directed against both the trader and his assistant or servant for a contravention of section 21 of the Salmon Fisheries Act, by exposing for sale or having in their possession salmon during close time. A motion was made and refused before the sheriff for separation of the trials. An appeal was taken against the sheriff's judgment, and the conviction obtained was set aside. Lord Young's opinion setting aside the conviction applies, I submit, directly to the present case. [Refers to opinion]. He says:—"I think there was no reason for including the servant in the charge." The precise words of the clause under which the prosecution was brought are these:—"Any person who shall buy, sell, or expose for sale, or have in his possession, any salmon," etc. So there you have the precise words which are founded on by the prosecutor here interpreted, I submit, according to the usual construction, and interpreted entirely adverse to the interpretation which the respondent here seeks to put upon them. A similar decision has been pronounced under the

Public-houses Act—Graham *v.* Lang, December 22, 1876, 4, Rettie, Justiciary Cases, 12. In that case a complaint was presented against a publican for an offence under the Public-houses Act, the offence being that of selling to a child apparently under 14 years of age, and the court held it was plain that the child—a girl of 10—had come as the servant and hand of another, of her mother—in short, the offence was not committed. She was not the buyer, but the person who sent her was the buyer, and accordingly it was not the case of a sale to a child apparently under 14 years of age. [Refers to Lord Young's judgment.] So there again, at the other end of the transaction as it were, we have the court putting the construction upon the word "buyer" which I ask you here to put upon the word "seller," as meaning the person who makes the contract, not the hand that executes it. I contend that is the just construction, not only upon the precise terminology of this particular Act, but also upon the view of the preamble and of the 17th section of the Act, and the decisions of the court upon precisely identical phraseology in other statutes. With regard to the adverse decisions of the English courts, my submission is first that the only adverse decision is one which is certainly not binding upon this court; that the reasoning upon which it rests obviously overlooks the argument upon the Statute which I have submitted, and that the *dicta* in the House of Lords were plainly *obiter dicta*, absolutely unnecessary to the decision of the case then before the court, and that there too the reasoning proceeds by overlooking the argument upon the Statute which I have submitted, and which I maintain is sound.

Lord Adam: Why is it you are charged upon the 15th section alone?

Mr. Ure: Because it is the only section in the 1868 Act which authorises prosecution and penalty.

Lord Kincairney: You sold prussic acid?

Mr. Ure: In one instance, but it was compounded with other ingredients.

Lord Kyllachy: It is not alleged there was any breach of section 17.

Mr. Ure: No; the simple question is under the first and 15th sections. The reference to the Act which comes closest to the present, the Sale of Food and Drugs Act of 1875, is 23 and 24 Vict., c. 84, sec. 1.

Lord Kyllachy: That Act does not bear on the question who is to be the qualified person.

Mr. Ure: No; but it bears on the general argument as to who is the seller.

*Counsel for the Respondent.*

Mr. Morison: My Lords, the complaint here is set out on page 6, and your Lordships will see that the appellant was charged with two offences against the 1st and 15th sections of the Pharmacy Act. I think all the necessary facts have been brought under your Lordships' notice, because it is undisputed that the appellant sold the poisons charged, and it is also undisputed that he himself has no qualification. He is neither a chemist nor a doctor, and he was unassisted in carrying out these sales by any qualified man, and it rather appears, from the statement at the bottom of page 4, that this appellant conducted the business during the absence of his master, the doctor. It is no doubt true that the shop belonged to the doctor, and that the drugs were his, and your Lordships will see that the question of law, as stated in Question I.—I may put it in this way—is whether the doctor's personal qualification is a sufficient cover to entitle him to allow any person to sell on his behalf. Now, our contention on the Statute is that no unqualified person can sell, and that it is irrelevant to inquire either who has the interest in the contract or whether the person selling acts as agent or principal, or in whose shop the sale is actually carried out That, I think, was the view which was taken by the court below, and I think it is justified by a sound construction of the whole of the Act. It is very important to notice that the purpose of the Act was not to create a monopoly for the sale of poisons in favour of doctors and chemists. My learned friend's view is that so long as the drugs belong to the doctor, and so long as the shop is his, so long as the proceeds of the sales go into his pockets, then the doctor may sell by the hand of whomsoever he pleases. Now, I submit that is affording no protection to the public. It is merely creating a monopoly of the sales of these poisons in favour of the doctors and chemists, and the curious result of my friend's view would be this, that if a doctor might have one shop and carry it on by means of unqualified assistants, he might have half-a-dozen or twenty shops, and he might supply the whole of the poisons for a town or a district, without ever looking near any of the shops, but so long as he received the profits of the sale he would be entitled to sell by any person he liked, and there would be no offence against the Statute. I submit that this is not giving any protection to the public as the preamble of the Statute requires. It is merely creating a monopoly in his favour. But the preamble, I think, justifies my view, because what it says is that it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, and compounding of poisons and so on, should possess a competent practical knowledge of their business, and should be duly examined as to their practical knowledge before commencing business—meaning, as I take it, to provide that where a person has to do a chemist's business, either in the way of retailing, dispensing, or compounding, or keeping open shop, in all those cases such a person is to have a competent knowledge of the business. One other curious result of my friend's view is this, that supposing a doctor sold one of the shops which he had—suppose he sold it to a third person who had no qualification—then the same assistant who was lawfully selling to-day would be incurring a penalty every time he sold a poison to-morrow, assuming that the shop had changed hands; although, so far as the public was concerned, there would be no change in the business. In order to prevent such a state of matters, the first section goes on to make two things unlawful—first, to sell, that is, to sell poisons, or to keep open shop for the retailing, dispensing, and compounding of poisons, or to use the title of chemist and druggist, and so on; and then the 15th section imposes a penalty upon each of these unlawful acts, for it says that any person who shall sell or keep open shop for the retailing, dispensing, or compounding of drugs and so on shall be liable to a penalty of £5. Now my first observation upon this section is that it is peculiarly adapted to meet the case of a single sale, because what the section says is that any person who shall sell shall for every such offence—and my reading of that is "for every sale"—be liable in the penalty. This also has to be kept in view, that the two things provided against by the first section are both penalised, both the selling and the keeping of the open shop. Then the 17th section, which was most strongly relied upon by my friend, is passed for a totally different purpose. The purpose of the 17th section is to trace where certain persons get certain drugs. The legislature has quite a different object in view in the first and 15th sections, where the purpose is to see that the public gets the proper drugs, or the drugs properly dispensed. The 17th section desires to provide against cases of poisoning, because it deals only with the most dangerous poisons, and the purpose of it is to enable anyone to trace where such poison was sold and to whom it was sold, and therefore there is a universal prohibition against selling these poisons in any but a particular way, because the words are that "it shall be unlawful to sell any poison, either by wholesale or retail," unless the box is labelled and an entry made. That is a universal prohibition, not only as against unqualified persons selling these poisons, but as against qualified persons, and it applies in all cases; and therefore, in order to trace the poison, what is required is not the name of the assistant, but the name of the master, and so the words of the section are that "for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller."

Lord Justice-Clerk: That would make him liable in that case, even though the hand that sold was a perfectly qualified hand?

Mr. Morison: Yes.

Lord Justice-Clerk: It is a breach of the Statute to do it by a servant, which involves a penalty, and it does not matter though the servant is perfectly qualified.

Mr. Morison: The distinction being that in this case there is a universal prohibition against selling these drugs except in the particular manner.

Lord Justice-Clerk: And an express provision that the master shall be responsible for the laches of his servant, however well qualified.

Mr. Morison: That is so. I found very strongly on the words "for the purposes of this section." It is not for the purposes of this Act, it is for the purposes of this section, and therefore the natural implication of that is that where we have been dealing with "sales" and "seller" in the previous sections, the meaning to be applied there is different. I submit that that is a natural inference from these words, "for the purposes of this section."

Lord Justice-Clerk: Section 17 would apply supposing the master was unqualified and the dispenser was unqualified. It would equally apply if the master was qualified and the dispenser was qualified likewise.

Mr. Morison: Yes, it is a universal prohibition. My friend founded upon the word "apprentice," and said that no one ever heard of an apprentice being qualified. That is introducing into this question a matter of fact which is not in the case, because my information upon the matter of fact is that there are numerous apprentices who are registered chemists, and the reason is that the period of apprenticeship required by the Pharmacy Act in order to entitle a person to sell is three years, whereas in point of fact the period of apprenticeship required in the trade is five years, and it is quite a common thing for an apprentice to enter under an indenture for five years, to learn his trade in three years, pass his examination, and get put upon the register, but during the other two years of his apprenticeship he is a registered chemist, and entitled to sell; so that any argument founded upon the word "apprentice" does not help my learned friend at all, and I submit that if this section is looked at as a whole it in no way derogates from what I submit is the fair meaning of the first and 15th sections—that the persons actually conducting sales shall be qualified persons, no matter whether they are selling as principals or agents. There is also the latter half of the 16th section corroborating that view, because therein it is provided that upon the decease of any pharmaceutical chemist or chemist and druggist, actually in business at the time of his death, it shall be lawful for his executor, administrator, or trustee to continue such business if and so long only as such business shall be *bonâ fide* conducted by a duly qualified assistant. That I submit is making it imperative that the business is to be conducted by a qualified man and that is the view which I think has been taken of the Act by all the judges before whom this question was considered. For instance, when the case came before the Court of Queen's Bench, Lord Justice Bramwell said on this matter: "Who would be liable under section 15 for compounding medicines of the British Pharmacopœia otherwise than according to its formularies? Surely the actual compounder." And Lord Justice Baggallay said: "And in the view which I take of the Act, the protection intended to be given to the public is sufficiently secured in the case of a corporation keeping open shop for the sale, dispensing, and compounding of poisons, for in my opinion the seller referred to in the first section is the actual seller, and not the individual or corporation on whose behalf he may act; and this view is supported by the language of the 17th section, which, when dealing, not with the simple selling of poisons, but with selling particular poisons without the adoption of special precautions, imposes a comparatively small penalty on the seller, but declares that for the purposes of that section the person on whose behalf the sale is made shall be deemed to be the seller, thus implying that, except for the purposes of that section, the person referred to in the Act as selling means the person actually selling, and not the person by whom he is employed." My learned friend has read the passage from Lord Selborne's opinion, which is entirely in my favour, and I need not detain your lordships by reading it again.

Lord Stormonth-Darling: Does not Lord Selborne say anything there about compounding? Is there the least doubt that an unqualified assistant may compound such a prescription as you have here? I think there is great danger of that.

Mr. Morison: Under supervision of his master, no doubt.

Lord Kincairney: Why do you make an exception in the case of the absence of the master? There is nothing in the Act about that.

Mr. Morison: In the case of the master's presence the master would really be conducting the sale, but where the master is absent——

Lord Kincairney: Then he would not be the seller in the master's presence, but he would be the seller in the master's absence.

Mr. Morison: At all events, the sale would be conducted so that all the requirements of the Act would be satisfied, because there would be a qualified person to supervise the sale.

Lord Kyllachy: Where is there anything in the Act which strikes at the compounding of medicines by unqualified persons? The two things that appear to be struck at are the sale of poisons by unqualified persons and the keeping open shop for the selling, compounding, and dispensing.

Lord Stormonth-Darling: If you look at section 4, it is absolutely necessary for a man, before he gets his qualification, to compound.

Mr. Morison: Section 4 refers to the assistant's being registered, and no doubt in order to learn a chemist's business an assistant has to do a certain amount of compounding, but he must do that under the supervision of his master.

Lord Justice-Clerk: He cannot possibly learn it except under the supervision of somebody.

Mr. Morison: That is so.

Lord Justice-Clerk: He would be learning nothing if he went into a room by himself and proceeded to compound. He might be learning how much mischief he could do, but nothing else.

Lord Stormonth-Darling: He might also sell under the supervision of his master. It is a little odd that he should be able to compound without qualification and yet require a qualification before he hands the thing over the counter and takes the money.

Mr. Morison : There is no harm in the case of mere compounding. He might do so for mere experiment, but in the case of selling the public are exposed to all the danger that is contemplated by the Act. In answer to Lord Kyllachy, the passage is in section 15, where it is said—" Any person . . . . . . who shall compound any medicines of the British Pharmacopœia except according to the formularies of the said Pharmacopœia, shall, for every such offence, be liable."

Lord Kyllachy : What was passing through my mind was this—that there might be a sale, and a completed sale, long before the compounding begins. A man may come in and order a poison and transact a sale with the master, and then the poison may be compounded in the afternoon, and the order be executed by an apprentice under his master's directions, and by a porter who carries the article to the house of the buyer.

Mr. Morison : I think that is quite possible, but at the same time I think it is equally clear that the policy of the Statute was to safeguard the public and to require that persons selling to the public should have the necessary qualification. That is the view which was not only taken by Lord Selborne, but was also taken by Lord Blackburn, p. 871 of the report :—"Now, is there anything in the object of the Act here which would require that we should so read the Act? I quite agree that a body corporate may keep an open shop, and no mischief is done if, for the purpose of conducting the sale of drugs, they keep qualified assistants, and if those qualified assistants perform or superintend the sale. There I see no harm that can arise. But no doubt the legislature, for what reason it is for those who passed the Act to say, have thought it best to say that a person—whom I take to be a natural person—shall not only not sell, but shall not keep an open shop for the sale. I think myself that probably one reason for that was to facilitate convictions ; and another reason may have been that it was thought if there may be a person who keeps a shop, who is unqualified, and he may have a qualified assistant, he may overrule the qualified assistant at any time he pleases, and there may be danger in that. Those are intelligible motives ; but neither of those motives applies where it is a case of a corporation ; for the body corporate itself could not interfere, and however much the body corporate may have been unqualified, their being so would not affect the matter at all. Then comes another objection. It is said if you put that construction you defeat the Act altogether. That I cannot admit. I hold distinctly that there can be no sale, whether a corporation be the ultimate vendor or not, unless a person, a natural person, manages the sale, and that natural person, if unqualified, would in my mind clearly become liable to the penalty under the Act.' And the observations by Lord Watson are to the same effect.

Lord Justice-Clerk : I suppose you would admit that if it had been proved in this case that the actual operation which the alleged assistant went through had been done under the personal supervision of his master, and his master had been a party to it, though not doing it with his own hand, the assistant could never have been convicted?

Mr. Morison : I think not. There never would have been any complaint, and there never is any complaint of that kind.

Lord Justice-Clerk : But you admit that such facts would have elided a change, because it would have been clear that he was assisting his master—doing the work that his master was wishing ?

Mr. Morison : Yes.

Lord Kyllachy : Where do you draw the line? Suppose the master gave directions, and then went into the back shop ?

Lord Kincairney : Suppose the master compounded and left it with the shopman ?

Lord Adam : That fourth case would be actual sale ?

Mr. Morison : I think so.

Lord Justice-Clerk : In some cases it would be a mere sham, and then there would be a proper conviction.

Mr. Morison : And here these observations do not apply, because the prescription was actually compounded by Tomlinson, and it contained prussic acid and a number of the dangerous poisons. But another result of my friend's argument would be this. The first fifteen sections do not apply to a corporation ; that is to say, a corporation is in the same position as a doctor, and if a doctor can put into a chemist's shop any person he chooses, so can a corporation, and therefore any two or three members of the public are to be able to start a partnership, and to put in any person they please to sell poisons, and, in the view presented on behalf of the appellant, nobody would be liable in a penalty. Mr. Justice Hawkins says :—" We do not agree in the view thus presented, nor are we at all impressed by the suggestion of inconvenience or hardship. Nothing, to our understanding, can be clearer than that the object of the Act was beyond all other considerations to provide for the safety of the public, and to guard, as far as possible, all members of the community from the disastrous consequences, so frequent in occurrence, arising from the sale of poisons by persons inadequately acquainted with their baneful properties, and the whole object of the Act would be frittered away, and the Act itself become a dead letter were we to declare by our judgment that an unqualified assistant can lawfully and with impunity sell any of the poisons to which the Act applies, unless upon each occasion of such sale he acts under personal superintendence of a qualified employer, or of a qualified assistant to such employer. By such personal superintendence we mean not mere presence in the shop or room where such sale takes place, but actual personal superintendence, so that every individual sale shall be so guarded round by those precautions prescribed by the Act that the safety of every member of the public may be provided for as far as the law can accomplish that object." The court consisted of Mr. Justice Hawkins and Baron Pollock, and in that case an appeal was refused. I submit, on the meaning of this Act, prohibition against selling is universal, and applies against any person selling, whether as principal or agent. I wish to say a word on the analogous Statutes referred to by my friend. One case quoted was the case of licensed premises. But the distinction between the case of a licence and the case of a pharmaceutical chemist is this, that in the case of the licence the licence attaches to the premises—in the case of the chemist the qualification required attaches to the individual. In the case of the licence, if the certificate is broken at all it must be the certificate of the master, that is all that can be infringed.

Lord Justice-Clerk : I thought it was the other way—that the licence was the licence of A.B., and that it was a breach of his licence.

Mr. Morison : But still it is a licence to sell in certain premises, and not elsewhere.

Lord Justice-Clerk : It is restricted to a certain place, but the licence is personal to him. It cannot be taken up by somebody else.

Lord Adam : Don't you think the two cases of selling fish and selling whisky are scarcely *pari casu* with this?

Mr. Morison : I think so.

Lord Adam : It requires no skill to sell fish or whisky, but you are dealing with a matter which requires great skill.

Mr. Morison: Yes, and that makes the distinction. It is a personal qualification which is required in the case of poisons, but that consideration does not apply in the case of the other Statutes. The only other point is as to the provision in favour of doctors in the first section of the Act of 1869. I found upon this that nothing whatever is said about a doctor's business. The word "business" is only used in connection with the 16th section of the Act of 1868, which applies to English apothecaries, and cannot possibly apply in Scotland, because there are no apothecaries in Scotland at all. I submit, on a sound construction of the Act, that the Sheriff was right, and that the conviction must stand.

*(To be continued).*

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Sale of Poisons by Unregistered Persons at Leeds.

At the Leeds County Court, on Friday last, before his Honour Judge Greenhow, William E. Dukinfield, who keeps a shop at 84, Kirkstall Road, Leeds, was summoned by the Council of the Pharmaceutical Society on two informations for having sold poisons without having the necessary qualification. The first charge was that of having sold chlorodyne, and the second of having disposed of oxalic acid.

Mr. Grey (barrister, London), addressing the learned judge, said that he understood that the defendant had that morning paid into Court the two fines, amounting to £10. He had to apply for costs for the attendance of counsel and witnesses.

His Honour: I grant that.

Mr. Grey then said that there was another case, that of R. Beaumont, 16, Milford Place, Kirkstall Road, Leeds, in which the fine of £5 was only paid into court on the previous Tuesday, and sufficient notice had not been given. He had to apply for costs in that case also.

His Honour: Yes; you may have your costs in that case too.

## PROCEEDINGS UNDER THE MEDICINE STAMP DUTY ACTS.

### Sale of an Unstamped Preparation at Barry Dock.

At Barry Dock police court on Thursday, March 15, before Major-General Lee and Dr. Neale, Joshua E. Jones, chemist and druggist, Thompson Street, Barry Dock, was fined 10s. and costs for exposing for sale a bottle containing a certain preparation to be used as a medicine without the same being duly stamped.—*Western Mail.*

## RECENT POISONING CASES.

### Accidental Poisoning by Carbolic Acid.

Thomas Bonnar, 46, miner, residing in Landall Terrace, Little Raith, Cowdenbeath, Fifeshire, died on March 18 from the effects of drinking a quantity of carbolic acid. Bonnar had risen early in the morning to take a drink of rum. By mistake he seized an acid bottle which was standing beside the rum, and gulped down a quantity of acid. Though the stomach pump was applied, Bonnar died within an hour after drinking the fluid.—*Edinburgh Evening News.*

## Reviews and Notices of Books.

Science Progress: A Monthly Review of Current Scientific Investigation. Edited by J. Bretland Farmer, M.A. Vol. I., No. 1.*

As announced in the editorial statement issued before the publication of the first number of "Science Progress," the paper is devoted to "notices and reviews of the effective work that is being accomplished in the various branches of science," the articles being in each case "written by persons specially qualified to deal with the subjects which they undertake." In the present instance Professor G. F. Fitzgerald writes on "Physical Science and its Connections," commencing his essay by the statement that "progress consists in the reconciling of apparent contradictions," and pointing out once more that science is progressing in the direction of specialisation and differentiation, which cause an interdependence of various branches, biology being unable to advance without chemistry, and geology leaning on physics. After discussing the effects of this interdependence at some length, the essayist concludes by indicating what may be some of the results of physical investigations into the structure of ether and matter. In "The New Theory of Solutions," J. W. Rodger discusses the hypothesis of van't Hoff; "Insular Floras," by W. Botting Hemsley, is a condensed summary of what has been accomplished in recent years in working out the details of the floras of remote islands or groups of islands, such as the Sandwich, Society, and Solomon Islands, Ceylon, the Indian Islands, Krakatoa, and the *Keeling* Islands; "Fossil Plants," by A. C. Seward, is a condensed account of the great mass of work which has tended to render palæo-botany an important aid in the elucidation of important botanical problems and stratigraphical questions, with full references to the literature of the subject. Dr. Buckmaster's paper on the "Origin and Nature of Certain Bacterial Poisons" is probably one of the most generally interesting at the present time, but may be regarded as mainly emphasising the lack of knowledge in this highly important subject. Professor G. B. Howes discusses "The Present Outlook of Vertebrate Morphology," and, finally, Professor W. D. Halliburton summarises recent work in "Chemical Physiology," classifying results under the headings—carbohydrates, fats, proteids and albuminoids, nutrition, respiration, blood and pigments, and urine. It will be gathered from the above description that the new journal is decidedly catholic in its scope, and that the first number comes well up to the standard fixed for the journal. It may be doubted whether it will be possible to continue on equally elevated lines for any great length of time, since there appears to be a risk of both matter and writers failing, within the comparatively narrow limits laid down, but everyone interested in the progress of science generally will cordially welcome the new comer and wish it long life and prosperity.

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* London: The Scientific Press, Limited. Pp. 104. 2s. 6d.

### DICTIONARY OF THE ACTIVE PRINCIPLES OF PLANTS.

By CHARLES E. SOHN, F.I.C., F.C.S.*

As indicated on the title page of this book, it deals with the sources, nature, and chemical characteristics of the alkaloids, bitter principles, and glucosides, occurring as the active principles of plants. An attempt has been made to classify nearly six hundred of these bodies, in tabular form, the idea being to permit of a given attribute of each substance being readily found, and also to indicate wherein such substance differs from, or resembles, similar substances. After explaining the plan of the work and giving general rules for using it, in an introductory chapter, the compiler proceeds in Part I. to classify the active principles in alphabetical order, under the names of the plants from which they are obtained, the latter being in turn in similar order. After the name of each substance its formula is given, and this is followed by the different reactions of the substance, references to authorities being given where required. Following this alphabetical list is a tabular summary of the same, constituting Part II. In Part III. the reactions, solubilities, etc., are classified, and, finally, there is a botanical index followed by an index of substances, reagents, etc. As it is stated that, wherever practicable, the information supplied in this work has been drawn from the original sources, and embodies the results of the latest researches, the amount of labour involved in its preparation must have been enormous. Though it is obvious that many of the data given should only be accepted with caution, verification or correction probably being necessary in very many instances, the use of the book as a work of reference cannot fail to economise both time and labour, and all persons interested in the substances described should find it more or less useful.

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only. Names of plants should be underlined, and capitals used for generic names only.*

### CHLOROFORM.

Sir,—In the Journal of March 8, 1894, under "The Month," you give a short extract from Dr. E. R. Squibb's paper on "Chloroform in 1893." The results of the two experiments given speak for themselves. You will perhaps, however, allow me a few words on the last sentence. Dr. Squibb remarks, "It is true that properly purified chloroform is chemically the same whether it be made from alcohol, acetone, chloral, or other material," and he then proceeds to say, "the practical condition still remains that it is comparatively easy to properly purify chloroform from alcohol, while from other materials it is more difficult, and therefore less likely to be accomplished." It is gratifying to find the opinion which I have held for many years—that properly purified chloroform is the same from whatever source it is obtained—supported by such authorities as Dr. E. R. Squibb, Dr. Schacht, and Dr. Biltz. The statement, however, that chloroform prepared from alcohol is more easily purified than that produced from other sources does not agree with my experience. And chemical examination of purified chloroform—home and foreign—found in the market does not lead me to believe that alcoholic chloroform is to be more relied upon as pure than that produced from other sources. Chloroform when properly purified being the same from whatever source obtained, it is altogether misleading to speak of the material from which it is produced as an indication of its purity. The only fair way to arrive at a satisfactory conclusion on this point is by the application of a sufficient number of suitable tests for the detection of impurities. In the new United States Pharmacopœia this seems to be fairly well recognised. The condition of a crude chloroform depends not only on the alcohol or other substances used with the bleaching powder, but also to some extent on the condition of the bleach itself. The same alcohol treated with different bleach gives crude products of different degrees of purity. The ease or difficulty therefore attending purification does not depend on the use of a comparatively pure material such as commercial alcohol, but rather on the character of the impurities produced. The fact remains that larger quantities of impurity require in some cases to be removed than in others, but "the practical condition" in this country now is that there are no difficulties in the way of producing pure products from either pure or impure sources which have not already been overcome. The admission that chloroform of equal purity is produced from alcohol, acetone, chloral, and other materials, and that the products are chemically identical, is an important step in the right direction, which will, I have no doubt, soon lead to the total breaking up of the prejudices which have so long and so unjustly surrounded the question of origin.

*Edinburgh.* DAVID BROWN.

### PAROCHIAL BOARD DISPENSING (SCOTLAND).

Sir,—Some time since the Board of Supervision passed a resolution recommending that Parochial Boards throughout Scotland should appoint a chemist, if there were any in the parish, to supply medicines and medical appliances to the poor of the parish. I shall be greatly obliged if any who have been appointed will take the trouble to communicate with me, and also those who consider they are entitled to the post and have not been appointed I am the only chemist in business in this parish. I applied to the Parochial Board for the supplying of medicine, etc., and was told that their present arrangement was quite satisfactory. The present arrangement is that the medical officer supplies the medicine, etc. He has not a qualified chemist in his employ that I am aware of.

*Rutherglen.* DAVID S. ROBERTSON.

### MEDICAL MEN AND PHARMACISTS.

Sir,—I have read with much interest the correspondence which has lately appeared in your columns under the head of "Medical Men and Pharmacists," and think that the temperate letter of the hon. secretary of the Margate Medical Society, in your issue of February 24, ought really to lead those chemists who cultivate a prescribing business seriously to think if their talents would not be better employed if used in a way more likely to bring about the much-to-be-desired unity and amicable feeling between the two classes. But, as a pharmacist, I quite understand how difficult it is in most cases to avoid putting up a mixture for a cold, or a couple of draughts for diarrhœa; and if the man who heartily dislikes prescribing refuses to give the customer a mixture for his complaint, and advises him to see a doctor, he usually thinks the chemist an ignoramus, disregards his advice, and simply goes elsewhere. Here, in Italy, where the feeling between doctor and pharmacist is a much more friendly one, it is usual for the former to dispense or for the latter to prescribe, and the remark of "H. S.," "that the public seem to expect a doctor behind every coloured carboy," leads me to suggest that a plan adopted in this and other continental cities might be worth trying in Margate, and, if successful, could be followed in other places. Nearly all the doctors here have, say, three or four pharmacies at which they call once or twice a day; and each pharmacy will have two or three—some perhaps half a dozen—medical gentlemen calling regularly, as near fixed hours as their professional engagements will permit, and prescribing for any patient who may be waiting for them. And it is a most common thing for a person to ask, "Is there a doctor in ?" and, if not, either to wait for the first to call, or to leave a message. Now, take a town in England with a dozen druggists and twenty doctors. It ought to be a simple matter to arrange that each pharmacy should receive a visit every third, or even every second hour during the day from a qualified surgeon. If the leading doctors set the example, the others would have no hesitation in following, and it would be to the advantage of all. The physician would get his fee—naturally it would be a small one, sometimes none at all, but in many cases it would lead to the patient paying the doctor a regular visit. The patient would have the satisfaction of seeing a qualified man without having to pay a formal visit to the doctor's house, which keeps many people with slight ailments away, and would get into the habit of consulting the doctor instead of the chemist, and the pharmacist would be relieved of all the responsibility and annoyance, and would merely have to dispense the prescription. There may be objections to such a scheme, but, as far as I know, it has not been tried in England, and even if it did not answer matters would be no worse than at present. One thing to be strictly avoided in order to make it a success is any pecuniary arrangement between doctor and chemist—or, in fact, bribery in any form whatever.

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* London: Baillière, Tindall, and Cox. Pp. i.-vii., 1 to 194. 10*s.* 6*d.*

*Rome.* H. B. MORGAN.

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### MEDICAL MEN AND PHARMACISTS.

Sir,—It is pleasing to observe that so much notice has been taken of our medical friend's letter on the above subject, but it is high time we were noticing the evil complained of in a more practical way than by mere passing comment. The letter referred to closes with a most reasonable appeal, to which every pharmacist should be able to give a clear and straightforward reply. Medical men and pharmacists are enrolled under the same colours in the struggle to preserve health in the community. They have the same end in view, and for securing that end all reason seems to say, "Let the work of each department be performed by those specially trained for it." The two departments so merge into each other that there is no sharp line of demarcation, and to quarrel over points of questionable overlapping would be neither dignified nor profitable. The business proper of a pharmacist is to compound and distribute medicines. He is also more and more being expected to understand their characters, and to add to our knowledge regarding them. The treatment of disease, however, is as much outside his business as the compounding of medicines is outside that of a grocer or drysalter. The sphere of a medical man may best be defined by his own body, but it appears to me he should not enter upon the sphere of a pharmacist when that specialist is to be had, the more so as in supplying drugs he brings upon himself, in addition to other objectionable conditions, the very real temptation of needlessly prescribing in order to augment his fees. In seeking a remedy it would be well to let each department deal with its own offenders, and I would observe that the ranks of the Pharmaceutical Society might be purged by the application of section 17 of its bye-laws. Obviously, however, that would not remove the evil, for offenders would simply flourish outside the Society as so many do at present. The remedy lies in empowering the Society to control the conduct of its licencees, even to removing names from the register if need be. Is not this the suggestion asked for in the *British Medical Journal* recently? Can anyone suggest a more reasonable method, or one more calculated to be effectual? It would be more far-reaching still were the sale of medicines as well as scheduled poisons restricted to licensed persons. Will not our medical brethren aid us with the full force of their influence in thus seeking to discipline ourselves? Since the remedy is so apparent, what does the apathetic pharmacist mean by nursing himself into a sick man and peevishly complaining? There is more for him to do than simply seek his own comfort, which when he recognises and does the more comfortable will he be. I would point out that medical men and pharmacists are both to blame for continuing to teach the public to regard medicine as the specific for disease instead of simply one of the factors in its treatment. They do provide the fulcrum for the lever of the advertising quack.

*Glasgow.* J. ANDERSON RUSSELL.

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### ŒSYPUS.

A note contributed by Mr. Hebbeler to the *Pharm. Journ.* (p. 748) contains the following remark: "In conclusion, allow me to point out that the term œsypus now generally used is not correct, as Pliny calls the substance œsypum." The original word in Dioscorides is *οἴσυπος, ὁ*, *i.e.*, œsypus, of which the word œsypum found in Pliny is only a translation. The literary question stands thus: Very many editions of Dioscorides are extant, most of which contain the Greek text and the Latin translation on the same page, though with different arrangement of print. The famous Cologne edition, 1529 (and there is none of higher authority), accurately represents the original, and throughout gives the word as œsypus. (*a.*) Qui vero œsypus quasi ovium sordes dicitur. (*b.*) Probatur œsypus qui ex lanis radicibus lanariæ herbæ non curatis collectus fuerit. (*c.*) Calefaciendi vires œsypus habet. Reference to the Library of the British Museum will show that the same rendering has been adopted in other commentaries and translations. It is also true that certain translators of eminence besides Pliny latinise the word as œsypum, thus converting a Greek masculine substantive into a neuter Latin noun. A reasonable doubt may be thrown upon the point of scholarship involved. Lastly, some English translators write the word œsypus or œsipus, œsypum or œsipum, but this is not material, as no argument can be founded on English spelling prior to a certain date. The word having once more gained a place in pharmaceutical literature, we are bound to preserve it in its original form of œsypus, and to reject a translation which is not in accordance with etymological construction.

*Shepherd's Bush, W.* JOSEPH INCE.

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### BENEVOLENT FUND.

Sir,—We may be a doomed class, but let us make our final bow as perpendicularly as possible, without the aid of Birmingham collecting-boxes in the "shape of mortars," or in any other shape. The best appeal to the public—in fact, our only chance of holding our own with the public—consists in making ourselves, *as far as possible*, essential to each one of our customers. This can be done to a considerable extent in the country; in London, possibly, to a much less extent. It is utter nonsense styling ourselves professional men unless we can import into our business the high standard of education and the urbane manners which a profession should possess. No doubt the stores and grocers will continue to afflict us, but there will always be a proportion of the public willing to pay for the chemist's time, skill, and civility, if only he do not set too high a price on these excellent qualities. If the Benevolent Fund needs augmentation—and it does—I venture to say that very few of the present subscribers would object to add twenty per cent. to their subscriptions. Some might do even more. But so long as there are chemists who subscribe probably less than a farthing in the pound of their net income to this fund, do not let us send the hat round to outsiders.

*Cambridge.* C.

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## Answers to Correspondents.

*G. W. Kendall.*—Please say what is the nature of the information you require.

*A. Lilly.*—You will find full particulars of all the metropolitan districts in Crespigny's 'New London Flora' (Hardwicke and Bogue).

*Apprentice.*—The fact is not stated in the standard works of reference, but try the experiment for yourself. The presence of iron is understood to be essential even in the case of zinc.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Hill, Laing, Nicholson, Reynolds, Sage, Shorthouse.

# "THE MONTH."

**The Chemistry of Aconitine.**

In the *Berichte* of March 19—containing the paper by Professor Dunstan, the substance of which was published at page 735—there is another paper by Freund and Beck, setting forth in more detail the evidence by which they have been led to dispute the conclusions arrived at by Dunstan. In regard to the observation that acetic acid is a product of the hydrolysis of aconitine, Freund states in a postscript that positive evidence of this fact was furnished by Ehrenberg and Purfürst in 1892 (*Ph. J.*, [3], xxiii., 86), but that he will defer further reference to that point until he learns how Dunstan reconciles the hydrolysis of aconitine with the formulæ he has hitherto adopted. In reply to the charge of discourtesy, he claims to have abstained from interference with Dunstan's investigation, and to have merely repeated and supplemented the experiments of Ehrenberg and Purfürst. He also repudiates any obligation to have informed Dunstan that he was thus led to doubt the accuracy of Wright's formulæ. Referring first to Dunstan's confirmation of Wright's formulæ for aconitine and for the products of its hydrolysis (with addition of two atoms hydrogen), and of the statement that aconitine is converted by hydrolysis into benzoic acid and an amorphous base aconine, he mentions that some years before Jurgens had adopted for aconitine the formula $C_{33}H_{47}NO_{12}$, and that Dragendorff, guided by apparently unpublished observations by Jurgens, took a different view of the hydrolysis, according to which aconitine was considered to split up into benzoic acid and picroaconitine, the latter being converted by further loss of benzoic acid and of methyl alcohol into aconine. Another view of the composition of aconitine and of its alteration was then put forward by Ehrenberg and Purfürst, who adopted the formula $C_{32}H_{43}NO_{11}$, and represented the alteration by hydrolysis by the following equations :—

1. $C_{32}H_{43}NO_{11} + H_2O = C_6H_5{\cdot}COOH + C_{25}H_{39}NO_{10}$.
2. $C_{25}H_{39}NO_{10} + H_2O = CH_3{\cdot}OH + C_{24}H_{37}NO_{10}$.
3. $C_{24}H_{37}NO_{10} + H_2O = CH_3{\cdot}COOH + C_{22}H_{35}NO_9$.

The experiments of the last-named chemists were repeated in order to clear up the discrepancies between the foregoing statements. Material for that purpose was obtained from E. Merck in the form of hexagonal crystals melting between 197° and 198° C. when rapidly heated. The analytical data obtained differed considerably from the figures calculated from Wright's formula, $C_{33}H_{43}NO_{12}$, approximating nearer to those required by the formula assigned to apoaconitine, $C_{33}H_{41}NO_{11}$. From the statement by Wright that aconitine is readily convertible into apoaconitine it might have been supposed that such an alteration had been effected, if the more recent work of Dunstan had not led Freund to doubt that assumption. The precise description of aconitine salts by Dunstan sufficed to settle that question, and it was found with surprise that while the substances were identical with those described by Dunstan, there was, however, a difference in their composition, Dunstan representing it by the formula $C_{33}H_{45}NO_{12}$, while Freund and Beck adopted the formula $C_{34}H_{47}NO_{11}$. Freund disputes the accuracy of the analytical data upon which Dunstan states his aconitine to be identical with Wright's, and since those data are the only evidence of identity, he holds that this is still an open question. Having regard to the alleged very close similarity of aconitine and apoaconitine, and to their own observations, Freund and Beck infer that both Wright and Dunstan have been misled by incorrect analyses, and they consider there is no evidence of the existence of apoaconitine. The data corresponding to the formula $C_{66}H_{88}N_2O_{21}$, assigned to japaconitine by Wright and Luff, agree with the formula $C_{34}H_{47}NO_{11}$, and that circumstance, as well as other facts, suggested the possibility that the base examined by Freund and Beck had been obtained from Japanese aconite, and not from *A. napellus* tubers, until they were assured by Merck to the contrary. But they have no doubt as to the identity of the base from both sources. A molecular weight determination gave a mean result of 663 for japaconitine (calculated for $C_{34}H_{47}NO_{11}$, 645), showing that the more complex formula is unnecessary.

According to Ehrenberg and Purfürst, aconitine contains four methyl groups separable by hydriodic acid in the form of methoxyl, and this statement is confirmed by Freund and Beck.

The results obtained by analysis of the gold salts of aconitine agree with the formula $C_{34}H_{47}NO_{11}$, and it is pointed out that this agreement was found to exist in the results obtained by Dunstan and Ince in seven analyses of the β-modification, but was attributed by them to the presence of impurity.

By boiling aconitine with water a clear solution is ultimately obtained, having a slight acid reaction. The product of 50 grammes yielded on evaporation 12 grammes of acicular crystals consisting according to Freund and Beck of picroaconitine benzoate, the quantity of benzoic acid formed showing that only about one-fourth part of the aconitine was split up, with formation of benzoic acid. The larger portion was split up into acetic acid and picroaconitine. The benzoate melted at 203°–204°, and the results obtained on analysis agreed with the formula $C_{32}H_{45}NO_{10}{\cdot}C_6H_5{\cdot}COOH$. A methoxyl determination gave 8·36 per cent. (calculated 8·27). Ehrenberg and Purfürst obtained 8 per cent. methyl in two analyses. The picroaconitine separated from this salt remained as a colourless varnish on evaporating the ether solution. In a pure state it is a white amorphous powder, melting at 125° C. with intumescence, and otherwise corresponding exactly with the description given by Dunstan of isaconitine, the identity with that substance being further ascertained by the examination of the hydrobromide, hydrochloride, hydriodide, and nitrate. In the second portion of crystals deposited from the solution obtained by boiling aconitine with water it was easy to detect the presence of acetic acid. After separating these crystals the remaining solution was mixed with ether and soda added until a precipitate was no longer formed. The alkaline liquor from which the ether solution had been separated was evaporated to dryness and the residue extracted with chloroform. The portion dissolved by chloroform being examined for aconine gave a hydrochloride presenting characters agreeing with those described by Dunstan for aconine hydrochloride, but analytical results corresponding with the formula $C_{25}H_{41}NO_9$. Aconine was also obtained from picroaconitine by hydrolysis as a further means of identifying picroaconitine with Dunstan's isaconitine. The amount of benzoic acid produced was found to be 19·6 per cent. (calculated 20·23 per cent.), and the hydrochloride of the base gave on analysis results agreeing with the formula $C_{25}H_{41}NO_9$. By heating picroaconitine for fifteen minutes with acetic anhydride, then diluting with water, and shaking out with ether, after addition of ammonia, the residue left on evaporating the ether solution became crystalline when rubbed with alcohol. By crystallising from hot absolute alcohol prismatic crystals were obtained, melting at 255°–256°, and after drying at 120° they gave on analysis results agreeing with the formula $C_{32}H_{44}NO_{10}{\cdot}COCH_3$, while the alcohol contained an amorphous substance not further examined. It now appears that the substance named picroaconitine by Freund and Beck and isaconitine by Dunstan is not an isomer of aconitine, but a product of its alteration. The chief question between these investigators relates, however, to the composition of aconitine itself—whether that is to be represented by the formula $C_{33}H_{45}NO_{12}$, or $C_{34}H_{47}NO_{11}$.

**Volumetric Determination of Iodine, etc.** In order to obviate the inconvenience of having to make frequent trials of thiosulphate solution in the determination of iodine, iodic acid, or iodates, Vitali proposes to make use of the reaction between iodine and sulphurous acid in the presence of water—

$$SO_2 + I_2 + 2H_2O = 2HI + H_2SO_4,$$

and then to determine the acidity with a normal soda solution. On passing sulphurous acid into water in which iodine is suspended, one molecule of sulphurous anhydride gives rise to two molecules of hydriodic acid and one molecule of sulphuric acid. The total acidity produced in this case corresponds to four molecules of a monobasic acid, each molecule representing 254/4 = 63·5 iodine. One cubic centimetre of normal soda solution will therefore represent 0·0635 of iodine. The experiment is conducted by adding to the iodine solution drop by drop a very dilute solution of sulphurous anhydride until a faint yellow colour is produced. Starch solution is then added and sulphurous anhydride passed into the liquid until the blue colour disappears. After adding some drops of phenolpthalein solution, titrate for acidity with normal soda, and the number of cubic centimetres used give the quantity of iodine when multiplied by 0·0635. To obtain exact results it is necessary to have the iodine solution neutral and the sulphurous anhydride solution free from sulphuric acid. Subject to the same conditions, chlorine or bromine may be determined by the same method, the end of the reaction being indicated in the case of bromine by the complete disappearance of colour in the liquid, and in the case of chlorine by the non-production of blue colour when a drop of the liquid is tested with starch paste containing potassium iodide. In the determination of iodic acid the reaction taking place is represented by the following equations:—

$$5SO_2 + 2HIO_3 + 4H_2O = 2I + 5H_2SO_4, \text{ and}$$
$$SO_2 + 2I + 2H_2O = 2HI + H_2SO_4.$$

Two molecules of iodic acid give rise to the formation of six molecules sulphuric acid and two of hydriodic acid, so that the total acidity corresponds to fourteen molecules of a monobasic acid, each molecule indicating 352/14 = 25·142 iodic acid, and each C.c. of normal soda representing 0 025142 iodic acid. In the determination of iodates the calculation has to be somewhat different, as shown by the following equations:—

$$5SO_2 + 2KIO_3 + 4H_2O = K_2SO_4 + 2I + 4H_2SO_4, \text{ and}$$
$$SO_2 + 2I + 2H_2O = H_2SO_4 + 2HI.$$

In this case the total acidity produced is equal to only twelve molecules of monobasic acid instead of fourteen each molecule, indicating 428/12 = 35·666 potassium iodate (*Bolett. Chim. farm*, 1894, No. 4, through *Apotheker Zeitung*, No. 17).

**Exalgin for Hypodermic Injection** The sparing solubility of this substance (1 in 48) has been hitherto an obstacle to its use by hypodermic injection. It is stated by P. Cesaris that it is readily dissolved by a solution of sodium salicylate, and he gives the following formula for the purpose:—

| | |
|---|---|
| Exalgin | 1·0 part |
| Sodium salicylate | 1·1 ,, |
| Distilled water | 10·0 parts |

(*Bolett. Chim. farm.*, 1894, 69).

**Cathartic Acid.** Jensz prepares this acid by evaporating an infusion of senna in vacuo, mixing the residual extract with an equal volume of alcohol, shaking well and leaving the mixture to settle for twelve hours. After decanting off the liquid, the deposit is again shaken with alcohol, and finally pressed. The filtered liquids are then precipitated with lead acetate, the precipitate separated and well washed by kneading with water until the washings pass away clear. The partially dried precipitate is mixed with alcohol and decomposed with sulphuretted hydrogen, excess of the gas driven off by passing a stream of carbonic acid or air through the liquid, then heating the whole in a vessel fitted with a reflux condenser, filtering to separate lead sulphide, and washing with alcohol. The clear liquid is then mixed with ether as long as a pale yellow deposit is produced, which is allowed to settle. After pouring off the ethereal liquid, the brown deposit on the sides of the vessel is washed with ether or strong alcohol, dissolved in a very small quantity of 30 per cent. alcohol, and evaporated at a temperature not exceeding 50° C. The preparation so obtained amounts to from 0·6 to 0·75 per cent., and it is sufficiently pure for medicinal use. Cathartic acid is described as having the characters of a glucoside, and a composition represented by the formula $C_{30}H_{38}NO_{15}$. It is soluble in hot water and alcohol. The dose is given as 0·10 to 0·15 gramme (*Pharm. Zeitsch. für Russland*, xxxii., 744).

**Detection of Peptone in Urine.** Salkowski gives the following test. The urine (50 C.c.), acidulated with 5 C.c. hydrochloric acid, is precipitated with phosphotungstic acid and warmed until the precipitate aggregates to a resinous mass. This is washed twice with water, mixed with 5 C.c. caustic soda (1·16 sp. gr.) and 8 C.c. water to dissolve the precipitate, and the blue solution warmed until it assumes a dirty grey colour. After cooling in a test tube, a one or two per cent. solution of cupric sulphate is added drop by drop, shaking after each addition. When peptone is present the liquid becomes deep red, and the colour becomes more apparent on filtering. By this test 0·015 per cent. of peptone can be detected. Urine containing mucus or albuminous substances must be freed from these before the test is applied (*Centralb. f. Med. Usch.*, 1894, No. 7.)

**Determination of Aconitine.** Aconite root examined by Keller was found to contain from 0·87 to 1·23 per cent. of alkaloid, as a frothy and partly crystalline mass, when shaken out with ether. For separating aconitine from the amorphous base the mass was washed with small quantities of cold ether, which leaves the aconitine as a white crystalline powder. By evaporating the ether solution of the amorphous base a small portion was obtained in a crystalline state. From 0·282 crude alkaloid 0·239 crystalline aconitine was obtained. By dissolving in 10 C.c. alcohol, adding water until the liquid becomes turbid, and then more alcohol until clear, spontaneous evaporation gives aconitine in colourless prismatic needles, but in smaller quantity. The crude alkaloid evaporated with phosphoric acid gives a rose coloration, pure aconitine does not, and the amorphous base gives a brown colour. With concentrated sulphuric acid the crude base gives a pale yellow colour, the pure aconitine remains colourless, and the amorphous base gives a red coloration (*Schweitz. Wochensch f. Chem. u. Pharm.*, 1894, No. 7.).

**Determination of the Iodine Number.** Dr. R. Seeliger suggests the following method for the purpose of dispensing with the use of mercuric chloride. Chlorine is passed into a solution of 10 grammes iodine in 200 C.c. alcohol for about ten minutes, when the iodine is converted almost suddenly into trichloride. Excess of chlorine is then driven off on the water-bath and the cooled solution made up to 250 C.c. On adding to this solution potassium iodide (1 to 5) a quantity of iodine equivalent to the chlorine is liberated, and it can be determined with a decinormal solution of thiosulphate. In carrying out an experiment with oleic acid, for example, 0·3 gramme dissolved in alcohol mixed with some chloroform is added to 10 C.c. of the iodine trichloride solution diluted with 50 C.c. of alcohol, and the whole left to stand for twenty-four hours. Then the potassium iodide solution (10 C.c.) is added, and after one hour the iodine liberated is determined with decinormal solution of thiosulphate, after having made a similar determination without adding oleic acid. The difference between the two results gives the iodine number. If fat is separated on adding the potassium iodide solution some chloroform is to be added, or an alcoholic solution of potassium iodide may be used. As hydrochloric acid and other chlorinated products may be formed by passing chlorine into alcohol, Seeliger recommends dissolving the iodine in carbon tetrachloride, and afterwards making up to 250 C.c. with alcohol or ether (*Pharm. Centralh.*, xxxv., No. 7).

**Decomposition of Ethylene.** V. B. Lewes reports to the Royal Society that the text-book equations representing what occurs when ethylene is decomposed by heat are probably incorrect. He finds that when the gas is passed through a heated tube no change is observable until a temperature of 800° C. is reached. Traces of acetylene are then observed, and this compound increases in quantity between 800° and 900°, large quantities of methane being also produced, together with liquid products—

$$3\,C_2H_4 = 2\,C_2H_2 + 2\,CH_4.$$

Hydrogen begins to appear and carbon is deposited near 1200°, the formation of oil decreasing until near 1500°, when the decomposition of the ethylene is practically complete, the products of decomposition being chiefly hydrogen, with some undecomposed methane and deposited carbon—

$$C_2H_4 = C_2 + 2\,H_2.$$

Between the primary and final decompositions represented by the above equations a large number of interactions occur, being due to the polymerisation of the acetylene formed from the ethylene, and also from the methane, as follows:—

$$2\,C_2H_4 = C_2H_2 + 3\,H_2.$$

Further heating of the decomposition products of ethylene results in the formation of ethane. This is decomposed, at 900°, into ethylene and hydrogen, thus:—

$$C_2H_6 = C_2H_4 + H_2.$$

**Alphol.** This is a salicylic ether of α-naphthol, and an isomer of "betol," the corresponding derivative of β-naphthol. It is prepared by heating a mixture of sodium salicylate, sodium α-naphthalate, and phosphorus oxychloride, to a temperature of 120° to 130°. Alphol, sodium metaphosphate, and sodium chloride are formed, thus:—

$$2NaC_7H_5O_3 + 2NaC_{10}H_7O + POCl_3 = 2C_{10}H_7(OC_6H_4)CO_2H + NaPO_3 + 3NaCl.$$

The sodium salts are removed by washing with water, and the alphol is then purified by crystallisation from alcohol. The compound is said to resemble salol in its therapeutic effects, and to split up into salicylic acid and α-naphthol in contact with the pancreatic and intestinal juices. The dose is from half to two grammes (*Journ. de Pharm. von Alsass-Loth. and Bulletin Comm.*, xxii., 85).

**Solvent Action of Tartrates.** H. N. Warren finds that the solvent action of Rochelle salt on metallic hydrates and carbonates, exemplified in ferric and cupric compounds, extends to ferrous compounds and to the hydrates and precipitates of zinc, manganese, nickel, cobalt, chromium, and aluminium. The precipitates of barium, strontium, magnesium, and calcium compounds are also to a considerable extent soluble when boiled with a concentrated solution of the tartrate, and both antimony and bismuth oxychlorides, as well as stannic compounds, are entirely dissolved on heating with a sufficient quantity. Cadmium carbonate is practically insoluble in a neutral tartrate solution, and cadmium compounds in solution may thus, by suitable means, be distinguished from cupric salts (*Chem. News*, lxix., 125).

**Euparin.** This is the name given by Professor Henry Trimble in February, 1890, to a crystalline substance, obtained from *Eupatorium purpureum*, to which the empirical formula $C_{12}H_{11}O_3$ was assigned. It has recently been investigated by C. C. Manger who, after purifying the compound, obtained it in acicular or prismatic crystals, with a constant melting point of 116°. He describes euparin as insoluble in water, sparingly soluble in petroleum ether, readily soluble in ether, chloroform, benzol, or acetone. It appears to form no sulphur compound with concentrated sulphuric acid, with chlorine it forms a definite but quite unstable substitution product, and with acetic anhydride a very unstable liquid compound is formed. Concentrated nitric acid converts it into picric acid, and on fusion with potassium hydrate it is converted chiefly into phloroglucol (*Amer. Journ. Pharm.*, lxvi., 120).

**Calcium Carbide.** H. Moissan has prepared a crystalline compound of carbon and calcium, $C_2Ca$, by employing the great heat of his electric furnace, the temperature in which may approach 3500° C. The crystals obtained are described as reddish-brown, opaque, and shining. Their density, taken in benzin at a temperature of 18°, is 2·22, and they appear to be totally insoluble. Hydrogen has no action upon the new compound, but the latter becomes incandescent in dry chlorine at a temperature of 245°, calcium chloride and carbon resulting. Bromine reacts with the carbide at 350°, and iodine vapour decomposes it at 305°. In oxygen it is decomposed, with formation of calcium carbonate, and in sulphur vapour at 500°, sulphides of calcium and carbon being formed. Nitrogen has no effect; phosphorus vapour converts the carbide into phosphide, without incandescence; arsenic in vapour reacts with the disengagement of much heat, and also combines with the calcium. Iron and antimony are the only two metals found to react with the calcium carbide. The most curious reaction, however, in which the new compound takes part is that which occurs when water is added to it. Pure acetylene is given off directly contact takes place, and the gas continues to be evolved until all the carbide is decomposed, thus—

$$C_2Ca + H_2O = C_2H_2 + CaO.$$

When aqueous vapour acts upon the carbide at a dull red heat, the decomposition takes place less energetically, and hydrogen is produced in addition to acetylene. Acids act upon the carbide chiefly when diluted, though fuming sulphuric acid decomposes it and develops a marked aldehydic odour, and chromic acid reacts with formation of carbon dioxide. Various metallic salts also cause decomposition, and when the compound itself is heated in a sealed tube with absolute alcohol to 180°, acetylene and calcium ethylate are formed, as follows:—

$$2(C_2H_5OH) + C_2Ca = C_2H_2 + (C_2H_5O)_2Ca.$$

A fine class experiment, demonstrating the violence of the reaction between acetylene and chlorine, is readily performed by allowing some fragments of calcium carbide to fall into a vessel containing cold water saturated with chlorine, the reaction being immediate (*Comp. rend.*, cxviii., 501).

**Carbon Boride.** H. Moissan also describes the compound of boron and carbon, $B_6C$, first obtained by Joly (*Comp. rend.*, xcvii., 456), and since prepared in sufficient quantity by means of the electric furnace to permit of an examination of its properties. The compound, which forms brilliant black crystals of the density 2·51, is said to be very stable and extremely hard. In the latter respect it even exceeds the carbon silicide which is now offered in commerce as "carborundum," for the powder obtained by crushing it has proved to be capable of replacing diamond-dust in the process of cutting diamonds. This is believed to be the first instance of a definite compound body being sufficiently hard to cut the diamond (*Comp. rend.*, cxviii., 556).

**Cinchonifine $C_{19}H_{22}N_2O$.** This is the name given by Jungfleisch and Léger to one of several isomers of cinchonine first mentioned by them some years ago (*Pharm. Journ.*, [3], xviii., 622). They now state that on several occasions since this base has been confused with cinchonine by different workers, and to prevent further confusion they have been induced to examine the compound again, and now publish their results in detail. Cinchonifine is now described as crystallising from boiling alcohol in small anhydrous needles, brilliant and colourless. It is insoluble in water, ether, or weak alcohol; only slightly soluble in cold alcohol or chloroform; but soluble in a mixture of the last two solvents. The crystals melt at 273°·6 (corr.), more than eighteen degrees above the melting point of cinchonine, and volatilise unchanged when strongly heated. They are dextrogyre, and the rotatory power augments as the concentration of the alcoholic solution increases. Details are given of a large number of salts of cinchonifine, and the authors conclude by pointing out that Hesse, who in 1890 doubted the existence of the base, last year described under the name "homocinchonine" a compound which presents very great analogies with it (*Comp. rend.*, cxviii., 536).

**Decomposition of Liquids by Cellulose.** C. Beadle, referring to Dr. Gore's recent work on the decomposition of liquids by powdered silica (*ante*, p. 622), suggests that the properties ascribed to silica are probably shared under some conditions by colloids in general, and he states considerations which seem to indicate that cellulose also exhibits well the phenomena of solid solution. If cotton wool be placed in a solution of a metallic salt it abstracts a certain amount of the latter, the exact proportion depending upon similar conditions to those obtaining in the case of silica. On dilution with water some of the salt dissolved by the cellulose redissolves in the liquid, but not always the full amount. In the case of ferric salts, for example, dissociation probably takes place, and the insoluble base is retained by the cellulose, though the acid is dissolved out (*Nature*, xlix., 457).

**A New Ptomaine.** C. Lepierre has obtained a new ptomaine from an over-ripe cheese made from sheep's milk, which had caused serious digestive disorders in persons who had eaten of it. The base, of which the formula has been calculated as $C_{16}H_{24}N_2O_4$, was separated in crystalline form. It is described as inodorous, bitter, somewhat acid, slightly soluble in water, and more so in alcohol. Its hydrochlorate is very soluble and crystallises in large needles; the platino- and auro-chlorides are also crystallisable. The specific rotatory power of the base is $[\alpha]_D = +11°\cdot3$ in water. Its salts are precipitated by acid sodium phosphomolybdate, picric acid, and iodised potassium iodide, but not by tanim (*Comp. rend.*, cxviii., 476).

**Bacillus orthobutylicus.** This is an anaerobic microbe isolated by L. Grimbert, occurring in the form of a movable, cylindrical rod, rounded at the extremities, and measuring from 3 μ to 6 μ in length by 1·5 μ in breadth. When young, however, it is shaped like the clapper of a bell. The older organisms form spores, two or three in number, and their movements then cease. The spores resist a temperature of 100° for one minute and of 80° for ten minutes. The bacilli are capable of inducing fermentation in glycerin, mannite, glucose and invert sugar, saccharose, maltose, lactose, galactose, arabinose, starch, dextrin, and inulin, but they are without action on trehalose, erythrite, or calcium lactate and tartrate. The products of the fermentative process are normal butylic alcohol; butyric, acetic, and carbonic acids; and hydrogen. The *B. orthobutylicus* differs from the *B. butyricus* of Pasteur and the *B. amylobacter* of Van Tieghem in not affecting calcium lactate or cellulose, nor is it coloured blue by iodine at any period of its development. From the *B. butylicus* of Fitz it is distinguished by its property of fermenting lactose and starch, and its inability to invert saccharose. Lastly, its power of forming normal butylic alcohol from various carbohydrates clearly distinguishes it from the *B. amylozyme* of Perdrix. This new organism is said to secrete a diastasic substance analogous to the amylase which transforms amylaceous bodies into maltose and dextrin, but the latter is also converted into maltose by the action of the bacillus, so that it cannot be identified during fermentation. Inulin is decomposed by it without undergoing saccharification; the glucose of invert sugar disappears first, the lævulose offering greater resistance; saccharose ferments without inversion, in a similar manner to maltose and lactose; glycerin, besides acetic and butyric acids and butylic alcohol, yields a small quantity of a left-handed lactic acid; and galactose, arabinose, and mannite behave like glucose, except as regards the relation between the products formed. Grimbert shows, however, that various factors—the nature of the medium and the manner in which it is decomposed, the duration of the fermentative process, the age of the bacilli, and the extent of their acquired habits—may modify the chemical action of the microbes. He suggests, accordingly, that the contradictory results obtained at times by bacteriologists may possibly be attributable to similar apparently minor points, which he has proved in his present work to be factors of considerable importance (*Journ. de pharm. et de chemie*, [5], xxix., 281).

**Active Principles of the Papayaceæ.** L. Guignard, who has shown that plants in certain families allied to the Cruciferæ, also resemble members of the latter order in containing similar active principles and yielding analogous volatile oils, now shows that the Papayaceæ, which have no botanical affinities with plants in the previously examined orders, yet resemble them as regards their active constituents and properties. Thus, *Carica papaya*, L., contains the ferment, myrosin, and the glucoside, potassium myronate, which combine in the presence of water to form the volatile oil, as in the earlier instances. The root is richer in the two principles than the other vegetative organs, the stem being very poor in glucoside. The leaves, however, contain proportionately more of the ferment than the root. From two other species, *C. condinamarcensis*, Hook. fils, and *Vasconcellea quercifolia*, Saint-Hil., the quantity of essential oil obtained was relatively much less than from *C. papaya*. The organs of the plants poorest in myrosin were found to be richest in latex, containing the vegetable trypsin—papain, but no constituent of the latex takes part in the formation of volatile oil. The myrosin is found in certain parenchymatous cells, and as regards the localisation of this ferment the seeds of *C. papaya* present a curious analogy with certain cruciferous seeds. The glucoside, on the other hand, as in the Capparidaceæ, exists alone in the seed albumin, though associated with a small proportion of ferment in the embryo (*Comp. rend.*, cxviii., 545).

**Odour of Benzoic Acid.** J. Passy, continuing his work on the limits of perceptibility of odours (*Pharm. Journ.*, [3], xxiii., 987), points out that, whilst stearic acid is odourless, and its aldehyde, alcohol, and ethers the same, in the case of benzoic acid and its associated compounds, the acid alone is odourless, and this only when pure and in the crystalline form. If diluted with any medium the characteristic odour at once reveals itself, as was proved experimentally when the acid was diffused in aqueous vapour or an aqueous solution warmed. A similar result was produced by the spontaneous evaporation of a one per cent. alcoholic solution on a watch glass or a piece of filter paper. Arohnsohn has shown that, though the odours cannot be perceived when solutions of odorous substances in pure water are introduced into the nostrils, this is due to the action of the water on the olfactory cells, and may be overcome by dissolving 0·6 per cent. of sodium chloride in the liquid and warming the latter to the temperature of the body. Under similar conditions the otherwise inodorous benzoic acid, in the proportion of one part in one thousand, yielded a clearly perceptible odour. Identical results to the above were obtained with cinnamic acid. Passy considers, therefore, that these compounds may fairly be regarded as odorous, as much so as vanillin, coumarin, and other compounds of the aromatic series, which are odourless below the temperature at which they volatilise. He concludes also that the so-called inodorous bodies may be divided into two categories:—1. Those which are, for normal human beings, beyond the limits of perceptibility by the sense of smell, such as stearic and other fatty acids, beyond the fourteenth term. 2. Those which may, under ordinary conditions, have no perceptible odour, such as benzoic and cinnamic acids, etc. (*Comp. rend.*, cxviii., 481).

**Convolvulin.** W. Kromer, continuing his researches on the convolvulaceous resins, has investigated convolvulin obtained from jalap. He finds that this body splits up on treatment with baryta, even without heat, into convolvulinic and methy-ethyl-acetic acids; the latter, being volatile, appears to have been overlooked by former investigators. Convolvulinic acid is monobasic, and its solution possesses the property of dissolving convolvulin; by hydrolysis it yields convolvulinolic acid and a glucose, the nature of which could not be satisfactorily determined.

Convolvulinolic acid is also monobasic and isomeric, but not identical, with jalapinolic and scammonolic acids. Mayer's convolvulinol the author considers to be impure convolvulinolic acid (*Pharm. Zeits. Russ.*, xxxiii., 1.)

**Lacticiferous Cells in Convolvulaceæ.** F. Czapek finds that all Convolvulaceæ secrete a milky juice. In *Dichondra* no transverse walls are present, the vessels have thick but never suberised walls. All other Convolvulaceæ contain series of cells, the transverse walls of which are not absorbed; the membrane is thin and ultimately suberises. These cells are developed in the embryo, and follow the course of the phloem-bundles (*K. Akad. d. Wiss. in Wien*, through *Bot. Centralblatt*, lvii., 267).

**Germination and Nutrition in Pollen.** Professor J. R. Green, in a paper communicated to the Royal Society, shows that both diastase and invertase are present in pollen grains, and that, at the beginning of germination, the amount of these is generally increased to a considerable extent. When, however, the germinating power of the grains is lost, the diastase is found to have decreased in quantity. During the growth of the pollen tube it is nourished by reserve material in the pollen grain, consisting of starch, dextrin, cane sugar, maltose, and glucose; and by the same carbohydrates, with the exception of dextrin, in the style which the tube penetrates. Enzymes, which assist in preparing the reserve-materials for absorption, exist in the style, and are the same as those excreted by the pollen tube in its passage through the conducting tissue. Absorption of food material is probably one cause of the increase in the amount of enzyme occurring during germination, and often results in the reserve store of the pollen grain being largely increased by the temporary deposition of starch. It is suggested that zymogens probably exist in some pollens, more particularly those that germinate in a faintly acid medium.

**Crystallisation of Cellulose.** E. Gilson finds that when sections of cellular tissue are kept in contact for a time with Schweitzer's reagent (cuprammonia), then washed successively with ammonia and water, so that the copper compound is dissolved gradually and the cellulose slowly precipitated, the latter forms nodular or arborescent crystals in the interior of the cells. The crystals are insoluble in dilute acids and alkalies, but dissolve in concentrated sulphuric acid, and behave generally as cellulose. Starch must be completely removed before applying the reagent, and certain other precautions are also found to be necessary. Two distinct substances appear to be present in most cellulose membranes, one only of which is crystalline. The other is amorphous, and gives no coloration with iodine (*Chem. Centr.*, through *Journ. Chem. Soc.*, lxvi., 107).

**Insects attacking Nutmegs.** J. H. Hart has collected specimens of several species of insects which attack nutmegs whilst being prepared for the market, and amongst them W. H. Blandford has identified the following:—1. *Trogosita mauritanica*, Linn.; 2. *Tribolium ferrugineum*, Fabr.; 3. *Carpophilus species*; 4. *Læmophlœus sp.*; 5. *Hypothenemus sp.*; 6. *Lasioderma sp.* The second was most common, and the last is possibly *L. testaceum*, which affects Indian cigars injuriously. The insects appear to have been imported into Trinidad in the corn and linseed meal employed as horse and cattle food. As a preventive the nutmegs are now sprinkled in the drying room, and also when packed for market, with quicklime in powder. A certain means of destroying the insects is to expose the nutmegs in air-tight receptacles to the vapour of carbon disulphide (*Trinidad Bot. Dept. Circular Note*).

**Resorbin.** This is the name given by Ledermann to a new excipient for medicaments intended for external application. Almond oil and distilled water are directed to be emulsified by means of a small quantity of yellow wax, gelatin, and soap. A little wool-fat is then added to give a proper degree of consistence. It is claimed that this mixture is specially adapted for penetrating the skin without the necessity of hard rubbing, very slight friction sufficing to effect complete absorption of quite a large quantity of the "resorbin," together with any medicament incorporated with it. It has been employed as a vehicle for pyrogallol, chrysarobin, mercury, tar, naphthol, and balsam of Peru. Mercury, when present to the extent of one-third, is very rapidly absorbed, by simply spreading a thin layer over the skin and exercising a slight pressure for a short time. This mercurial preparation is also said to be free from any unpleasant smell (*Rif. Med.*, through *Brit. Med. Journ. Epit.*, 1732, 39).

**Quinine in Pills.** Kursteiner prepares quinine in pilular form by mixing intimately ten grammes of quinine sulphate and two each of citric acid, powdered gum, and sugar of milk, then massing with syrup. The pills, when cut, are rolled first in starch and afterwards in talc (*Moniteur*, xliv., 1423).

**Toxicity of Thyroid Extract.** Chantemesse and René Marie describe a case of myxœdema in which injections of thyroid extract, though producing a decided ameliorating effect, in extra strong doses caused vertigo and considerable discomfort, the symptoms being decidedly toxic. A sheep was therefore experimented upon with the extract during several months, and a marked elevation of temperature was noted to follow the injection of any unusually strong dose. The discomfort produced caused the animal to become very irritable, and on several occasions it broke down the walls of the place in which it was confined. When, however, the injections ceased, the animal soon recovered its normal health and condition (*Soc. med. des hôpitaux* through *Nouv. rem.*, x., 104).

**Thermometer for High Temperatures.** Baly and Chorley describe a thermometer which can be employed for all temperatures between - 8° C. and 650° C. The instrument is made on the same principle as the ordinary mercurial thermometer, very hard glass being employed, and an alloy of mercury with potassium and sodium serving for the expanding liquid. This alloy has the advantage of being liquid through a very much greater range of temperature than mercury, its freezing point being - 8° C. and its boiling point 700° C., whereas mercury freezes at - 40° C. and boils at 357° C. (*Berichte*, xxvii., 470).

The Pharmaceutical Journal

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*SATURDAY, MARCH 31, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

### FRENCH IDEAS OF PHARMACEUTICAL EDUCATION.

IN a paper in the *Bulletin de Pharmacie de Bordeaux*, Professor HUGUET, of the Clermont-Ferrand School of Medicine and Pharmacy, outlines a programme of pharmaceutical education. He first defines a pharmacist as one who practises pharmacy, and then describes the latter as an art, depending upon numerous scientific data, and concerned with the methods of combining natural substances, by means of suitable operations conducted in special apparatus, so as to produce, preserve, and determine the value of preparations fit for medicinal use, the crude substances employed being chemical products, or materials obtained from the animal or vegetable kingdoms.

The pharmacist, he considers, should know the therapeutic properties of the medicaments he prepares, since his profession brings him in daily contact with the medical man, who frequently resorts to him for information and assistance. It is urged, therefore, that the pharmacist should, of necessity, study the following subjects:—Physics, chemistry, botany, zoology, pharmacy, therapeutics, biological chemistry, hygiene, minor surgery, toxicology, legislation, and deontology. The reasons urged for studying the first five subjects named need not be recapitulated, for it is generally acknowledged in this country that the better a pharmacist is acquainted with them the more proficient he is likely to become in the practice of his chosen art and profession.

As regards therapeutics no more is suggested than that, for the pharmacist's own protection in dispensing, the medicinal properties of bodies should be known and, more especially, their posology. By biological or physiological chemistry is not meant purely scientific work, but the analysis of urine, serous liquids, blood, etc. Knowledge in that direction will undoubtedly improve the professional status of pharmacists as well as prove a source of extra profit to them. General notions of hygiene, and the ability to be of temporary assistance in cases of accident, pending the arrival of a surgeon, as well as an acquaintance with the antidotes to poisons, can scarcely prove otherwise than useful to pharmacists, so long as they are careful not to infringe upon the province of the medical practitioner. Finally, it cannot but be regarded as exceedingly desirable that those who are most directly affected by questions of pharmaceutical legislation and ethics should be well versed in such matters. This programme, says Professor HUGUET, in conclusion, covers what is essential in the education of the pharmacist, and what will suffice him. There does not appear to be the least ground for regarding this estimate as other than a fair and reasonable one.

### ARSENIC IN A BOARD SCHOOL.

ACCORDING to the *Morning Leader* there was very nearly a tragedy in a large East-end Board school last week. The name of the school is not given, but it is stated that from the stores department of the London School Board was sent for use in the chemistry class a large jar of what was supposed to be distilled water, and in the ordinary course of things this jar would have been passed round the class for the scholars to drink from in order that they might comprehend the difference between distilled and ordinary hard water. But the assistant master, it is asserted, first drank some of the liquid himself, and found that the water contained arsenic in solution. The jar, it is supposed, had at one time been used for arsenic, and had not been cleaned out. This extraordinary tale would appear to require fuller confirmation before acceptance, the circumstances as reported being hardly consistent with ordinary experience.

### THE ANNUAL DINNER.

THE first list of stewards in connection with the annual dinner of the members of the Pharmaceutical Society and their friends will be found in the advertisement columns of this week's Journal. Gentlemen desirous of acting as stewards, who have not already sent in their names to the Honorary Secretary, Mr. RICHARD BREMRIDGE, are requested to do so without further delay.

### RESEARCH LABORATORY.

WE understand that annual grants have been voted by the Salters' Company, for the advancement of chemical pharmacology, etc., by the foundation of scholarships in the Research Laboratory of the Pharmaceutical Society, and St. Thomas's Hospital Medical School.

### MEDICAL APPOINTMENT.

WE are informed by Professor ATTFIELD that his son, D. HARVEY ATTFIELD, M.A., B.C., D.P.H., has been appointed English quarantine medical officer at Suez.

# Proceedings of Societies in London.

## QUEKETT MICROSCOPICAL CLUB.

A meeting of the above Club was held on March 16, 1894, Mr. A. D. Michael, Pres. R.M.S., Vice-President, in the chair. The Secretary said they had received a donation which required something more than a formal acknowledgment. As members were aware, the Club's collection was undergoing revision, and Mr. Morland, who had undertaken the Diatomaceæ, had presented a series of thirty-seven slides to replace others found to be bad or wanting. A special vote of thanks to Mr. Morland was carried unanimously.—The Chairman, on behalf of the subscribers, presented Mr. F. A. Parsons with an address and a valuable gold watch as a testimonial to his zealous endeavours, as secretary of the excursions sub-committee during the last ten years, to make these gatherings a success. Coupled with these was a special series of pond-life slides, prepared and presented by Mr. C. F. Rousselet. Mr. Parsons expressed his most sincere thanks for the very kind and handsome manner in which they had seen fit to requite the efforts he had made to render the excursions pleasant and profitable to those joining them.—Professor Edinger's photographic and drawing apparatus, made by Leitz, was exhibited and described by Mr. C. L. Curties.—Messrs. Swift exhibited and described their new biological microscope, which had the posterior limb of the tripod doubled and rotating on a pivot, thus giving increased steadiness to the stand and, at the same time, enabling it to be packed in a smaller case. It was explained that the pivot was provided with a strong spiral spring, which would prevent it becoming loose, and also take up any wear at the bearing surfaces.—Mr. E. M. Nelson's paper on "The Determination of the Foci of Microscopical Objectives, Lantern and Camera Lenses by Arithmetical Formulæ," was taken as read.—Mr. H. W. King read a paper on "Amœba." A discussion ensued, in which Mr. J. D. Hardy, the Chairman, and the author took part.—The Secretary announced that the first excursion of the season would take place on Saturday, April 7, at the Royal Botanic Gardens, Regent's Park.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, March 15, Mr. T. Tickle, Vice-President, in the chair.

Mr. H. A. Potter read a paper on the "Materia Medica of the Garden," advocating the growing, by pharmacists in possession of gardens, of specimens of plants having medicinal interest, rather from an educational than commercial motive. A list of medicinal plants suitable for the garden, and either ornamental or interesting, was suggested.

A discussion ensued, to which the Chairman, Secretary, Messrs. Hill, Moore, Garnett, and Bryan contributed.

A report on pharmacy was then given by Mr. W. Moore. The report gave rise to a discussion, in which the Chairman, Messrs. Potter, Hill, and the Secretary joined. After a brief discussion on miscellaneous topics the meeting adjourned.

# Provincial Transactions.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION

A meeting of the above Association was held on Thursday, March 15, when Mr. W. G. Ellis, M.A., of St. Catherine's College, delivered a most interesting lecture on "Bacteria."

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

A general meeting was held in the Society's Rooms, on Wednesday, March 14, the President, Mr. Newsholme, in the chair. A highly instructive and interesting lecture was given by Mr. W. Kirkby, of Manchester, entitled "The Microscopical Characters of some of the more important Official Drugs." The lecture was illustrated by limelight, and some beautiful slides were thrown on the screen. After a discussion, in which Messrs. Morrison and Austen took part, a hearty vote of thanks was given to the lecturer.

## MEETING OF CHEMISTS AT PONTYPRIDD.

On March 15, a very successful meeting of chemists was held at Pontypridd, Mr. Walter Smyth, J.P., occupying the chair. After a warm discussion on several points of general trade interest, it was agreed that it was very desirable that a better and more amicable understanding should exist between the medical men of the local mining districts and the chemists, and that all chemists in the districts should personally approach the medical men, when an opportunity presented itself, with a view to raising the status of the two professions. It was also decided that the honorary secretary, Mr. T. Richards, should communicate with the Secretary of the Pharmaceutical Society, requesting him to send a list of stamped medicines containing poison.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

At the meeting of this Society on March 20, Mr. Frank Walker, president, in the chair, the secretary read a couple of dispensing notes contributed by Mr. Fred Walker:—

(1.) ℞ Liq. strychninæ..... .................. ℥ss.
Acid. hydrobromic. dil. ............ ℥ss.
M. m. 20 pro dosi.

(2.) ℞ Liq. strychninæ................. ...... ℥ss.
Potass. iodid. .......................... ʒii
Aquam ad. .............................. ℥iii
M. ʒi pro dosi.

In the first case the strych. hydrochlor. is probably salted out through excess of acid. It is soluble on dilution, also on heating, but recrystallises on cooling. In the second case the alkaloid is thrown out by the potass. iodid.; this may be retarded by mucil. tragac. Mr. E. Williams mentioned a similar difficulty he had experienced with a mixture containing liq. strych., acid sulph. dil., and quin. sulph. As Duncan had pointed out, the crystals deposited in this case proved to be strych. hydrochlor., salted out by excess of acid sulph. dil. On further addition of acid, however, double metathesis occurred, strych. sulph. being deposited. If liq. strychninæ B.P. be made according to the "parts" formula, the salt was almost certain to crystallise out, but if made from the "weights and measures" formula, the solution was stable. He suggested that in the next B.P. the stable salt, strych. hydrochlor., be used in place of the alkaloid and acid, 10 grs. of strych. hydrochlor. being equivalent to 9 grs. of alkaloid.

Dr. J. R. Logan then delivered a lecture on "Evolution." The whole history of the evolutionary theory was lucidly explained, and the lecture was listened to with great interest. On the proposition of Mr. E. Williams, seconded by Mr. J. R. Burn, a cordial vote of thanks was accorded to the lecturer. The lecture was illustrated by lantern slides and paintings.

# Scottish Transactions.

## GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, March 15, "Notes on Recent Additions to the Museum" of the North British Branch of the Pharmaceutical Society, compiled by Mr. J. Rutherford Hill, and sent with the specimens, was read by the Secretary. The specimens dealt with were Dalmatian insect powder flowers and powders; a portion of the "Hanbury" collection; New Zealand antimony; aconite root grown by Mr. E. M. Holmes; xanthaline, the new opium alkaloid; and several others. There was a good attendance of members, who profited greatly by the interesting nature of the evening's proceedings. A microscopic exhibition followed the notes, when a number of slides were examined by the aid of four microscopes.

The President, Mr. W. L. Currie, referred to the loss the Association and pharmacy in Glasgow had sustained in the death of Mr. Alexander Rose, who was a member of the Pharmaceutical Society and a subscriber to the Benevolent Fund. He was of a retiring disposition, and did not attend their meetings, but he gave them full sympathy and support. He had the confidence of leading physicians, and numbered among his clients many of the best families in town. The President moved that the members record their sympathy with the bereaved wife and family. Mr. Thos. Dunlop seconded the motion. Mr. Laing also spoke of Mr. Rose as a complete code of ethics in himself, and Mr. Jas. A. Russell said he looked upon Mr. Rose as a true gentleman in the full sense of the word. His opinions on any subject were readily given when asked, and had the merit of being carefully thought out and matured by experience. He always took a keen interest in everything that tended towards the advancement of pharmacy.

The Treasurer submitted a statement of the supper expenses, leaving a balance of £6 15s. 6d., which was handed over to the Kinninmont Prize Fund. In connection with this successful termination the President stated that Mr. Wm. Tait had presented the tickets and menu cards free of charge, and he asked them to accord Mr. Tait the thanks of the Association. A vote of thanks to Mr. Rutherford Hill was very heartily accorded. The President, referring to the close of the session, tendered his thanks to the members for their cordial support during the two years he had held office.

## EDINBURGH CHEMISTS, ASSISTANTS, AND APPRENTICES' ASSOCIATION.

The ninth meeting of the sixteenth session was held on Wednesday, March 21, at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair.

Mr. Alexander Murray read a paper on "Some Old Remedies," and Mr. W. B. Cowie gave an interesting lecture, illustrated by diagrams and specimens, entitled "Comparison of the Stems of the Monocotyledons, Dicotyledons, and Acotyledons."

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### GLASGOW APPEAL CASE.

*(Continued from page 810.)*

*Reply for the Appellant.*

Mr. Guthrie: The case before your Lordships is a very important one, and applies to a very large circle of persons who have hitherto carried on business under the belief that they were entitled, if they were themselves qualified and if they selected competent assistants, to do so without any liability either at common law or under the Pharmacy Acts. Of course, if they don't take care to select competent assistants, and if anything happened, there would clearly be a liability at common law. But in conducting their business they have been under the belief that if they selected really competent assistants and had the shop so arranged in conformity with the Act in the way of poisons being labelled, and so on——

Lord Justice-Clerk: What do you mean by a competent assistant?

Mr. Guthrie: A man who had sufficient knowledge to be able to select what was asked and to compound in the shop a prescription put before him in written form.

Lord Justice-Clerk: Competent in the judgment of the practitioner.

Mr. Guthrie: Clearly, and if he be selected an incompetent assistant——

Lord Justice-Clerk: Then in every summary case of this kind there might be a long inquiry as to the personal qualification of the assistant.

Mr. Guthrie: No, not in a case of this kind, but if an action of damages were brought at common law on the ground that he had selected an incompetent man.

Lord Justice-Clerk: I thought you used the words "competent assistant" as being a good answer to this criminal charge.

Mr. Guthrie: No, with deference, I was not.

Lord Justice-Clerk: Then I don't see the relevancy of it.

Mr. Guthrie: What I said was that there would be no liability against him at common law, and we say there would be no liability against him under this Act; if he is qualified himself he is entitled to have an unqualified assistant to dispense and compound drugs, and that is sufficient under this Act.

Lord Adam: At common law you would not require any proof of competency of the assistant because the master would be responsible for the act of his servant.

Mr. Guthrie: Clearly.

Lord Kyllachy: And you say the legislature here trusted to the responsibility of the master?

Mr. Guthrie: We do, and that the judges in England are mistaken in thinking that the legislature intended to go further. In England the view seems to have been that the legislature intended to take the further step and to prohibit any person having to do with the dispensing or compounding, or handing over of drugs, unless he was qualified. Now we think that the view we present is a view which is manifest on the face of the Statute, because while the Statute undoubtedly starts with the statement that it is passed for the safety of the public, it goes on to explain in what sense the public safety is to be provided for. Mr. Justice Hawkins dwells on the passage relating to the safety of the public, but completely ignores, as we venture to think, the extent to which the Statute was intended to provide that in all cases the public should be kept perfectly safe. Up to that time, as your Lordships know, any person could open a shop, any person could sell, and there was no responsibility under the previous Acts which had been passed, these Acts only preventing persons who were opening shops and selling from doing so under the particular name of pharmaceutical chemist or pharmacist. The Statute most distinctly shows its purpose was limited when it says it was expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, and compounding of drugs, and persons known as chemists and druggists, should possess a competent, practical knowledge, and should, before commencing business, be duly examined as to their practical knowledge. Now, if that be so, we think that the Statute in the whole of the rest of the provisions is quite capable of being, and ought to be, interpreted in accordance with the view presented in the preamble. On the other hand, when my friends come to section 1, they seem to put a construction on "sell," which I suppose they might in other circumstances possibly put on "keep open shop" also, because in a sense the assistant, who is the only person there, is keeping an open shop. In the same way there is a popular sense in which an assistant may sell, but in the sense of the Statute we submit that neither does the assistant keep open shop, nor does he sell.

Lord Justice-Clerk: Must not your argument come up to that? Suppose a qualified man according to you gets an assistant whom he considers fit for the purpose, does it make any difference whether he ever goes to the shop himself at all or not? He may have fifteen shops.

Mr. Guthrie: He may.

Lord Justice-Clerk: And he may never go near any of them. Well, if he had fifteen shops, and never went near any of them, would not his assistant in each be keeping open shop?

Mr. Guthrie: The assistant would not be keeping open shop. He is not the man whose name is above the door.

Lord Kyllachy: The owner of the shop is the shopkeep ?

Mr. Guthrie: Yes. The idea was to strike at unlicensed traders.

Lord Justice-Clerk: Then who is keeping open shop in the case of a limited company consisting of a number of ladies and gentlemen. Is it not the assistant?

Mr. Guthrie: No.

Lord Justice-Clerk: Then in their case no one keeps open shop, though it has been held they do?

Mr. Guthrie: It may quite well be that the Statute has not had in view what it was very natural they should not have in view, because it is a quite recent thing that these corporations and drug companies have started. When the Act was passed all that was known was individuals keeping open shop.

Lord Justice-Clerk: Or companies. There must have been companies.

Mr. Guthrie: No; I understand these drug companies are recent things.

Lord Justice-Clerk: But there must have been large firms in the drug line?

Mr. Guthrie: I understand there were wholesale shops of that kind, but not retail.

Lord Justice-Clerk: Take Duncan, Flockhart, and Co. They had several shops in Edinburgh. Who would be the guilty party there, supposing the authorities wanted to charge somebody?

Mr. Guthrie: They would charge the partners of the firm.

Lord Justice-Clerk: But the partners might be ladies?

Mr. Guthrie: And Duncan, Flockhart, and Co. are just an instance of people who may have several shops, but the legislature trusts they will have the shops so arranged that all the poisons shall be distinctly labelled, and that they will have persons there who are fit to dispense and compound.

Lord Justice-Clerk: If they trusted them there would be no need for the Act of Parliament.

Lord Kyllachy: Would it be possible for a man, in complying with the provisions of section 17, to have half-a-dozen shops which he only visited once a day?

Mr. Guthrie: Practically it would be impossible, because people would come into the shop wanting a strong poison—say prussic acid—and would have to be told, "He is not here; you must wait."

Lord Justice-Clerk: But under section 17 the only offence consists in handing it out without a particular label.

Mr. Guthrie: No, the real point of section 17 is that the buyer must be known to the seller of the drug. The reason is that assistants are flitting out and in and don't know the neighbours.

Lord Kyllachy: And further, the owner of the shop, the shopkeeper, must make personally, or cause to be made, an entry in the book at the time.

Mr. Guthrie: He must, and the buyer must be known to him, or introduced by a person who is known, and the object there is perfectly manifest, just as we say the object of the Statute was perfectly manifest and perfectly proper, namely, that there should be somebody responsible if anything goes wrong, and here is the man at the head of the shop, and that man is a regularly qualified druggist, belonging to a particular society, who has served a particular apprenticeship and passed particular examinations.

Lord Stormonth-Darling: It rather occurs to me that perhaps the provision about personal acquaintance with the buyer accounts for the special interpretation clause. If a man goes into a bank he does not get his money unless he is known, but it is enough if he is known to the teller. Here it would not be enough to be known to the assistant; he must be known to the actual shopkeeper, and that may be the reason—I don't know whether it is or not—why the legislature thought it proper to make that quite clear.

Lord Justice-Clerk: But suppose the assistant knew him to be perfectly well-known to the seller—had seen him speaking to the seller in the shop the day before, and seen them shake hands—would that not be enough? And if the master had told the assistant: "That is so and so; he may probably want some poison at some time; you can sell it to him?"

Mr. Guthrie: I think the legislature meant that the shopkeeper himself should take down the individual cases where poison is asked in the book.

Lord Justice-Clerk: Or cause it to be done.

Mr. Guthrie: In reference to what Lord Stormonth-Darling has said about the 17th section and the interpretation clause, apparently the argument on the other side is this, that in section 17 you have to read into that, "For the purposes of this section only, the person on whose behalf any sale is made shall be deemed to be the seller." That would be a very serious conclusion for the prosecution, for it would come to this, that under section 1 you could not prosecute the shopkeeper, because he would not be the seller. It would of course suit them quite well if they could persuade your Lordships that either the shopkeeper or the salesman is to be taken as the seller, but it will not suit them, I should think, to maintain—and they have not ventured to do so—that under section 1 the only person who can be prosecuted is a person who in some sense which they have not yet defined is the seller. If under section 17 only he is the seller, then under section 1 the shopkeeper himself may be prosecuted. Apparently it would come to that.

Lord Kyllachy: No, it is the compounder, and the compounder alone.

Mr. Guthrie: With regard to section 1, it has been pointed out by Lord Moncreiff that the Act is not in a very satisfactory shape, and section 1 illustrates that, because if you read the word "sell" alone it would apply to a wholesale transaction. Section 16 expressly excludes wholesale transactions, but under section 1 it does not say "sell by retail," it says "sell or keep open shop for the retailing," etc. Now, the idea apparently was that if a man sold, even if he did not keep an open shop—if he was a seller or if he kept open shop—and any transaction of sale could be proved against him, then in either case he should be liable in penalties. The two are put together, and we say that in neither the one nor the other does the expression "keep open shop" or "sell" include any more than the person who in the eyes of the law is the seller.

Lord Kincairney: Does the Act apply to doctors in the country who sell without keeping an open shop?

Mr. Guthrie: I think it would. That is, of course, on the view that our argument is wrong that doctors are exempted. We say doctors are exempted under the Act of 1869.

Lord Kincairney: But in the Act of 1868, without 1869?

Mr. Guthrie: I suppose it would apply to doctors.

Lord Kincairney: Would that not account for "sell or keep open shop?"

Mr. Guthrie: Yes, I think that would just be a case where it would apply. Now, your Lordship sees how our view enables the court to arrive at a clear conclusion on a definite principle There can be no difficulty in working out the Act if our view is correct, because the question would simply be—whose name is above the door? Who is the shopkeeper? If our view is wrong, then you are at once into the questions which have been referred to from the bench. If it is not the man on whose behalf the sale is made, you may have half-a-dozen people engaged in the transaction. One takes the order and the money.

Lord Kyllachy: And concludes the sale.

Mr. Guthrie: And concludes the sale. Then he has nothing more to do with it. The bringing down of the different drugs which are to be compounded is done by somebody else. Then the compounding—the mixing them together—is done by somebody else again; and then the parcel is made up and handed over by another individual. I am told that in England the result of the decision is this ridiculous one, that unqualified assistants do everything except hand over the parcels to the persons who come into the shop. That is the result to which the views that have been arrived at in England have brought the trade, not that there has been any difference in the way of conducting it.

Lord Justice-Clerk: Are these facts in the special case?

Mr. Guthrie: Well, I will take it this way, that that is a possible result, and apparently that would be quite consistent with the views which have been put forward in England; and we submit that if the purpose of the Statute be as we state it was, and as the Statute itself states it was, then the whole purpose of the Statute is met in the case we are now dealing with, because it is not denied that Dr. Kelly is a duly qualified chemist as well as a duly qualified practitioner. On the 17th section I have already submitted the view which we suggest as the result that my friend's argument would come to. Your Lordships have already heard from Mr. Ure what we maintain on the question of the reference there to the apprentice. I don't know on the facts how it stands—what my friend has said about apprentices—whether they may pursue an apprenticeship after they have been duly qualified. That sometimes happens with doctors in hospital practice, and so on, and such a supposition is quite conceivable. But the legislature has made no distinction.

Lord Adam: Section 4 provides for registered assistants.

Mr. Guthrie: It is to be a period of not less than three years. Now, the suggestion is that some men may remain after their apprenticeship of three years. I don't think that is the idea in the Statute, because what the Statute means by apprentice is their apprenticeship for three years—men who have gone through the statutory apprenticeship.

Lord Justice-Clerk: It only says that if you have been an assistant for three years and passed a modified examination you may get a certificate as qualified. The apprenticeship is a different thing.

Mr. Guthrie: It does not seem to imply that a man is necessarily an apprentice.

Lord Kyllachy: There is no such thing as a statutory apprenticeship.

Lord Stormonth-Darling: But all that must be done before a qualification is got.

Mr. Guthrie: Yes.

Lord Stormonth-Darling: All the compounding of prescriptions.

Mr. Guthrie: He is to possess this competent practical knowledge which is referred to, and how he is to acquire that, unless he is to be entitled to dispense and compound, one does not quite see; and of course the real danger arises in the dispensing and compounding, because once the thing is made up no mortal man can tell what is in it and what is not in it.

Lord Justice-Clerk: One does not see any great difficulty in it. I suppose every apprentice does his work under the eye of his master, or the journeyman who acts for the master in instructing him?

Mr. Guthrie: But in this particular case your Lordship sees that in section 17 the person on whose behalf the sale is made is deemed to be the seller.

Lord Justice-Clerk: What I mean is, that if he is sent to weigh out two or three ounces of some particular article, some qualified person can see him do it. That is the way in which it is done. Of course there is a lot of harmless work that the apprentice may do without an eye upon him at all, but in all difficult matters the master is not doing his duty for his apprentice fee unless he instructs him and sees that he does it.

Mr. Guthrie: You will see what endless difficulty and complications that would land us in. If the master is in the next room, leaving word that the apprentice is to do it in a certain way, is he to stay and see him do it? Take the case of a doctor in the position of Dr. Kelly. He gets an order and he leaves it, being called out to see a patient. These doctors have certain hours when they go out and visit, and other hours when they are in. Would it be possible to work the Statute? Would you not be landed in endless difficulty? Whereas, if you have simply to inquire who is the man responsible for the business——

Lord Justice-Clerk: I do not think that is what we have to consider at all. The legislature may think it better to have something not very workable than to run the risk of having poison sold in ounces when it should only be sold in drachms.

Mr. Guthrie: Yes, if the legislature had made its meaning so absolutely clear as to exclude our construction.

Lord Justice-Clerk: Suppose it is unworkable, we have nothing to do with that.

Mr. Guthrie: I should say that if there are two possible constructions of the Statute, the one that is manifestly workable would be preferred by the court. We say there are not two possible constructions. We say that the word "sell" has a well-defined and well-recognised meaning, but supposing there is a popular sense in which the assistant sells, the court is entitled to consider what would be the effect of holding that the Statute meant to embody not the ordinary legal sense, but an outside popular sense in section 1.

Lord Kincairney: Is this Act directed against the shop-boy at all? Is he said to know anything about it?

Mr. Guthrie: I don't think it has anything to do with anybody except those who are traders themselves.

Lord Kincairney: According to the case for the prosecution, it cuts against a shop-boy or assistant of any kind.

Mr. Guthrie: Undoubtedly; and it goes the whole length apparently. If he has had anything to do with making up these drugs or handing them over, then the prosecution can come down upon the head of the shop on that account.

Lord Justice-Clerk: If the man who dispensed was qualified?

Mr. Guthrie: No.

Lord Justice-Clerk: It is quite plain that in many cases the Act cannot have contemplated it should be the owner only who did the act.

Mr. Guthrie: I am not aware of any such case.

Lord Justice-Clerk: In what case?

Mr. Guthrie: The prosecutor comes to the shop, and finds half-a-dozen people have had to do with this total transaction, some shop-boys, some qualified assistants, some unqualified assistants, and if he finds a single one who has not a qualification it is said he is entitled to select him for prosecution.

Lord Justice-Clerk: I thought you said that the reading on the other side necessarily involved this, that the proprietor who kept the shop must be the person who does dispense.

Mr. Guthrie: No, I was mistaken if I said that. What they think is that they can come down upon any person who has had to do from beginning to end with what they call the transaction of sale.

Lord Kyllachy: Unless he has a qualification.

Mr. Guthrie: Unless he has a qualification.

Lord Justice-Clerk: They may come down upon anybody who has done what the Act specifies, if he has not a qualification.

Lord Adam: The difference seems to be this, that in your view, if a person is passed as a qualified seller, he may authorise anybody else whatever to sell.

Mr. Guthrie: That is so.

Lord Adam: On the other hand the view is that nobody shall sell except a person who has been found qualified by the proper authorities.

Mr. Guthrie: Now, what does "sell" mean in that sense? Do they mean the man who takes the order and who takes the money, or don't they go very much further and say that the person who has to do with the mixing of the drugs is the seller in the sense of the Statute, because he is the man who really has to do with the dangerous part of the operation? If that be so, why did not the Statute say that no person shall compound or dispense drugs unless he has a qualification? That would have been a very simple idea to express. But the legislature have not said so. They have said "You shall not sell." That is surely taking the order or being entitled to do so, and taking the money.

Lord Justice-Clerk: But then you see in this particular case the person who has been convicted took the order, made up the medicine, took the money, and handed the medicine over.

Mr. Guthrie: What I mean is the man who really has the interest in the transaction. He is the person, and he is the only person.

Lord Justice-Clerk: You are going back upon what you said a little while ago, because your case is that if the master had been prosecuted he would have had no defence.

Mr. Guthrie: Oh, no; the master is qualified.

Lord Justice-Clerk: But then he did not do anything.

Mr. Guthrie: He did this; that the thing was sold by him in the eyes of the law.

Lord Kyllachy: He is the seller.

Lord Kincairney: But he is qualified.

Mr. Guthrie: He is qualified.

Lord Adam: Then nobody can be convicted under section 1 at all?

Mr. Guthrie: Yes, any unqualified trader. Dr. Kelly, if he had not had a qualification, could have been convicted.

Lord Justice-Clerk: What would he have been convicted of in this case?

Mr. Guthrie: He would have been convicted of selling drugs, he not being a qualified person.

Lord Justice-Clerk: I thought you said he would not have been.

Mr. Guthrie: What I say is, if he had not been qualified. Suppose he had not been qualified, the purpose of the Statute, which was to prevent unqualified persons keeping open shop, would clearly have been broken, and he would have been liable under section 1. In this particular case it is an accident that the man who took the order and who took the money was the same person as the man who compounded the drugs. But suppose they had been two people, would both of them have been liable to prosecution, or would it only have been the man who sold in the proper sense of taking the order and taking the money? But there is no power in his hands to do anybody any harm. The real power is in the person who has to do with the handling of the drugs; but the Statute did not contemplate that at all. The Statute did not go into that. The Statute wanted to prevent anybody and everybody opening druggists' shops, and to ensure, partly in the interest of the public and partly, it may be, in the interest of the Society who promoted the Act, that the trader himself should be qualified.

Lord Stormonth-Darling: I do not see that the sheriff-substitute has found what your client did.

Mr. Guthrie: No, he simply finds that on two occasions Dr. Kelly was not present, and the business was being conducted in his absence by the appellant. For aught that is found, the order may have been taken by Dr. Kelly himself.

Lord Stormonth-Darling: He may have had nothing to do with these two particular poisons.

Mr. Guthrie: In the complaint we have certain facts stated, and you will notice that these facts are held proved, the whole averments of fact contained in the complaint. We may assume that the appellant, on behalf of his principal, was acting as the hand by and through whom the transaction was carried out from beginning to end; but we submit that Dr. Kelly was the real seller, and Dr. Kelly being qualified, it is not suggested that any prosecution could possibly be made against him. There is just the other point, and it is important—namely, does the fact of Dr. Kelly being a qualified medical practitioner make any difference? Because, I believe, in Glasgow—not in Edinburgh, but in Glasgow—there are a great many shops kept by qualified practitioners, and the question therefore is a very large and important one. Now, whatever the Statute may have effected, it is surely quite manifest that it was not intended to put a qualified medical practitioner on a lower footing than an apothecary. In England, under the 1868 Act, the 16th section does not include qualified medical practitioners; partly because, I suppose, in England the people who kept apothecaries' shops had qualifications as apothecaries, and not in any other sense it limited the exemption to any legally qualified apothecary and any member of the Royal College of Veterinary Surgeons of Great Britain; and then when that was found out the Statute of 1869 was passed, which we submit meant to place a legally qualified medical practitioner who has taken certain qualifications in drugs in the same position as the apothecary, and if that be so, then the Statute says it is not to interfere with the business of a legally qualified apothecary or, as we read it, of a legally qualified medical practitioner. That is exactly, we submit, in the lines of what the preamble says. If you can get a man himself qualified, whether it be as a medical practitioner, whether it be as an apothecary, whether it be as a registered chemist, that is all we want to ensure, and if in the one capacity or the other he is registered, then you shall not be entitled to prosecute. But then the Statute went further, we say, in the case of the apothecary, and in the case of the legally qualified practitioner. In these cases, it is said, the business shall not be interfered with; and even though I am wrong in my other argument, the Statute seems in favour at all events of these persons, that there shall be no interference with their business—that is to say, with the way in which their business is carried on, and, among other things, we maintain, with the persons whom they may choose to employ. I therefore submit that the judgment here was wrong, and that the appeal ought to be sustained.

Lord Justice-Clerk: You seem to be under the impression that the words "interfere with the business" refer to the medical practitioners under the Act of 1869, but they do not. The Act of 1868 prevents interference with the business of a legally qualified apothecary, but the Act of 1869 simply says that the Act is not to affect a person who has been registered as a legally qualified medical practitioner.

Mr. Guthrie: I cannot deny that it is not exactly expressed as in section 16 of the Act of 1868, but what I submit is that the legislature cannot have intended to put a legally qualified medical practitioner on a lower footing than an apothecary, and that the true purpose of the Act of 1869 was to place the legally qualified practitioner in the same position as the apothecary.

Lord Kyllachy: Is it not the case that section 1 of the 1869 Act provides that nothing contained in the first fifteen sections of the recited Act shall affect a duly qualified medical practitioner?

Mr. Guthrie: Yes.

Lord Kyllachy: And your client is a duly qualified medical practitioner?

Mr. Guthrie: Yes.

Lord Kyllachy: Though it does not affect him, it affects him with regard to his assistants.

Mr. Guthrie: It prevents him undoubtedly employing unqualified assistants, and in that sense it would affect him. Now, I say the Statute was meant not to affect him at all.

### *Reply for the Respondent.*

Mr. Salvesen: My Lord, I do not go so far as my friend Mr. Guthrie in submitting to the court that there is only one possible construction of the words which are in dispute,—the words being that it shall be unlawful for any person to sell poisons unless such person shall be a pharmaceutical chemist,—but I do submit that where there are two possible constructions the court will in preference select that construction which will carry out the professed object of the Act. Now the evil which the Act was passed to prevent was the evil, which apparently had been brought prominently under the notice of the legislature, of mistakes being made in the dispensing of prescriptions which contained poisons, and persons accordingly suffering from the effects of such mistakes. My friend suggests that against such mistakes there is a sufficient precaution in the shape of the liability of the master of the person who is guilty of the mistake, he being liable at common law for damages. My Lord, if the legislature had been satisfied with that liability, I submit the Act would never have been passed; and I think that the construction which is put upon the preamble of this Act by Mr. Guthrie is scarcely warranted by the terms of it, because you will notice that the preamble is that it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, and compounding of poisons, and persons known as chemists and druggists, should possess a competent practical knowledge of their business. Now it plainly contemplates that those persons should be carrying on their business in person, and that in carrying on the business as they do they should possess a competent practical knowledge of it; and the reason why the Act says it is expedient that persons in that position should have a competent knowledge of their business is that it is expedient for the safety of the public. If my friend's construction is right, it seems to me that all that this Act secured—apart from the provisions of section 17—was a monopoly of the business of chemist and druggist to persons holding a certain qualification, because if such a person may if he chooses leave his business to be conducted by boys, as was the case in the present instance, then the public are not protected in any way from the mistakes which such boys may make in carrying on the business on their master's behalf. This lad Tomlinson was a lad of sixteen.

Lord Kyllachy: Where does that appear?

Mr. Salvesen: I don't know it does. It is an answer to a remark my friend made. We submit this is just a typical instance where the Act should apply, because, as my friend admitted, the doctor is necessarily absent during the greater part of the day, and he leaves the business in charge of a boy of sixteen, who is left in full charge of the contents of the shop, and has power to compound and sell poisonous drugs. I submit that the Act is, as Justice Hawkins said, a dead letter, if the view my friend suggested is the sound one, because you have no protection provided against the very class of accidents which it was meant that the Act should provide against. According to his view you might have a child of seven dispensing these drugs and selling poisons, but if the master happened to be a duly qualified practitioner or a duly registered chemist, no person would be liable for the effects of a mistake except the ordinary liability which existed before the Act was passed, that the man would be liable at common law for damages to the injured party.

Lord Justice-Clerk: And criminal prosecution if any evil consequences resulted, such as the death of a person.

Mr. Salvesen: Yes, that protection existed before the Act was passed. A man might be guilty of culpable homicide if he permitted an absolutely unqualified person to sell poison, and the result was to kill some one.

Lord Kyllachy: Are there no examples of the legislature only providing partial remedies for admitted evils?

Mr. Salvesen: I have no doubt the statutes are sometimes defective, but this Act would be singularly effective if your Lordships adopted the view which has been taken in England, that the words "it shall be unlawful for any person to sell" apply to the person who is actually conducting the sale, because it would interpose the safeguard which I think it was intended the Act should provide, namely, that there should be some skilled person in the shop who should compound and sell any drug containing poisonous substances. In this connection I should like to refer to section 4, which it is said fortifies the argument in support of the view my friend presented, because it apparently contemplated unqualified persons dispensing and compounding prescriptions; but these prescriptions are not prescriptions which contain poisonous substances at all. You may have an infinite variety of prescriptions containing substances not specified in schedule A.

Lord Kyllachy: That section does not exclude poisonous prescriptions.

Mr. Salvesen: No, it does not; but I should fancy that any registered chemist would not allow his apprentices to obtain their experience of their business by compounding poisonous drugs.

Lord Justice-Clerk: Without his personal supervision at the time; and where it was a prescription containing poisonous drugs you would expect him to exercise more careful supervision than where it was just making up a mixture of rhubarb and magnesia.

Mr. Salvesen: You will notice the very poisonous substances in schedule A are extremely limited. There are some ten in part 1, and five in part 2. The observations I have made as to the Act being a dead-letter are really pointed, I think, in the view my friend contends for, as to the construction of section 1, by what has been held in the case of the Pharmaceutical Society reported in 5 Appeal Cases, because it has now been authoritatively settled that a corporation need not contain amongst its members any person who has a qualification at all, and therefore you may have, in the view of my friend, a corporation or a partnership none of the members of which are registered chemists, which employs only unqualified persons. In such a case you have absolutely no protection to the public in the event of their applying for prescriptions which contain poisonous substances at the premises of such a corporation. In Scotland that would cover a very large number of cases, because the case of the Scottish Drug Depôt settled that a partnership comes within the meaning of a corporation, so that if you have two persons who are carrying on business together under a partnership name these persons may employ, if they choose, any number of unqualified assistants, they themselves possessing absolutely no qualification, and yet nobody will be responsible under section 1, according to the construction which is put upon that section by my learned friend. Now, I submit that where you have a choice between two constructions of this section, one of which will absolutely defeat the professed object of the Act and the other will carry it out more or less effectively, the court will adopt the one which promotes the object which the legislature had in view, and that is the view which has been taken by no less than six distinguished judges in England. There is an absolute *consensus* of opinion as to the proper construction of this Act, and that is derived from considering the object of the Act, which is a perfectly legitimate consideration in construing its terms.

Lord Kyllachy: You say there is an absolute *consensus* of opinion. I thought Mr. Guthrie referred to Justice Grove and Chief Justice Cockburn.

Mr. Salvesen: Yes; and I think the judgment of Justice Grove does not touch this case at all, because he was dealing with section 17, and does not profess to be dealing with section 1 at all.

Lord Kyllachy: What did the Queen's Bench decide in the original case that went to the House of Lords?

Mr. Salvesen: They held that "person" included corporation. That was all that was decided in the case, and it did not deal, so far as I see, with the question we are now dealing with. That judgment was reversed, and there were two distinct opinions expressed by Justice Baggallay and Justice Bramwell; and then we have the opinions, very clearly and distinctly expressed, by the Lord Chancellor and Lord Blackburn in the House of Lords. The House of Lords simply affirmed the decision of the Court of Appeal in that case, which had reversed the decision in the Divisional Court; but I don't find that the two judges who decided that "person" included corporation expressed any opinion adverse to the one for which I am contending. So that you have six judges in England all applying their minds to this question and holding that in their view the words with which we are dealing must be so construed, looking to the object of the Act, as to carry out as far as possible that declared object. I submit that in construing a British statute, as this is, it would be very unfortunate, to say the least of it, that a different construction should prevail here, and that the public of Scotland should not have the same protection as the public of England have at present, under these decisions, with reference to the purchase of poisonous drugs in shops which are kept open for the purpose of retailing them.

The Lord Justice-General: We shall consider this.

## PROCEEDINGS UNDER THE ARSENIC AND PHARMACY ACTS.

### ACTIONS AGAINST CHEMISTS AND DRUGGISTS.

Several cases of importance to pharmacists were heard by the Bolton County Magistrates on Thursday, March 22, four charges having been laid against Robert Harrison, chemist and druggist, Farnworth:—

1. Selling poison (arsenic) to a person under full age, thereby contravening the Arsenic Act of 1881.
2. Selling a preparation of prussic acid called chlorodyne, being a poison named in schedule A of the Pharmacy Act, 1866, to a person unknown.
3. Selling arsenic unmixed with soot or indigo in proportion required.
4. Selling aforesaid preparation called chlorodyne without having made the required entries, obtained the necessary particulars and signature of the purchaser, and the purpose for which the preparation was required.

There was a similar list of charges against Thomas Coope, chemist and druggist, Farnworth.

The prosecutions were conducted by Mr. M. Fielding, solicitor, Bolton, on behalf of William James Leggett, secretary of the Patent Medicine Vendors' Defence Association, Liverpool.

The second charge against Harrison was first gone into.

Robert Wilson, aged 13, of 4, Tulloch Street, Liverpool, deposed that on February 24, under the instructions of Jos. Drury, the association's enquiry agent, he called at Harrison's shop and purchased two ounces of chlorodyne, at 8d. an ounce, after which transaction he handed the chemist a note, which was a prescription for "sheep dip." He paid 6d. for the sheep dip.

Cross-examined by Mr. H. L. Ferguson: He told the chemist, on Mr. Drury's suggestion, that his father was a farmer. His father, however, was an engineer. He also said that his father used the arsenic in a pan which was used for nothing else.

Mr. Drury was then called, and deposed to receiving a bottle and package from the lad, which he passed on to Mr. Edward Davies, analyst. Witness, cross-examined by Mr. Ferguson, said he told the boy to say what he did, although he knew the statements to be untrue. The sheep dip was composed of 1 ounce sulphur, 1 ounce potash, and 1 ounce white arsenic.

Mr. E. Davies, analyst, was called, and produced the paper which had contained the sheep dip.

After Mr. Fielding had observed that there was no name on it, only the word "poison" on the label, witness said that four grains of arsenic would kill a man, but the compound in question, which he had analysed, contained enough to kill one hundred people. In answer to the Bench, he said that one fly paper would kill a man. He had had much experience of fly papers, having been engaged in the Maybrick case.

Mr. Ferguson said that under the Arsenic Act, under which this case was heard, it was stipulated that the arsenic must be pure, and not compounded. Again, the mixture in question was a prescription, as shown by Mr. Brown, because it was used as a lotion for the destruction of insects on sheep skins. Further, pure arsenic must not be sold unless mixed with soot or indigo, whilst this sheep dip was white. The case had therefore been brought under the wrong Act—the Arsenic Act—and should have been brought under the Pharmacy Act, but the provisions of that Act had been fully complied with.

The magistrates retired, and on returning imposed a fine of 5s. and costs, including a guinea for analyst's fee. It was intimated that a case would be granted if Mr. Ferguson would state his point of law in writing.

In the case for selling prussic acid contained in a bottle of chlorodyne, the evidence of sale was repeated, and Mr. Davies, the analyst, was again called. He said there was not enough prussic acid in the whole of the bottle to kill an adult, there being not quite four minims of pharmacopœia strength per ounce, but there was four grains of hydrochlorate of morphine in the two-ounce bottle, which would just about kill a man.

Cross-examined by Mr. Ferguson: The bottle produced contained less prussic acid than chlorodyne generally did. It was possible to discover the quantity of prussic acid, although it was very volatile. He should describe the chlorodyne as a preparation "containing" prussic acid. Subsequently witness said it was a preparation "of" prussic acid.

Mr. Ferguson, for the defence, said that it was more a preparation of chloroform and morphine than of prussic acid.

The Bench, however, decided to convict in this case also, and imposed a fine of 1s. and the ordinary court costs.

All the other six cases were withdrawn.

## RECENT POISONING CASES.

### Death from Overdose of Opium.

At the Chelsea Town Hall on March 22, Mr. Luxmore Drew held an inquest as to the death of Ellen Hannaway, aged 74, lately residing at Caroline Place, Chelsea, who was in the habit of taking opium, and appeared from the evidence to have taken an overdose.

John Balfree,[*] chemist, assistant to Mr. Spurling, of Marlborough Road, said he had known the deceased for six years as an opium eater. She usually purchased ¼ oz. for 6d., but formerly she had more. He ascertained she had purchased it at the shop for 18 years. The drug came under the second part of the schedule, and he carried out all the requirements of the Pharmacy Act by labelling it.

Dr. Stafford Cox, of Sloane Square, said he had been attending the deceased for a month. She died on Sunday. In consequence of a rumour he heard he refused a certificate. A *post-mortem* examination revealed that death was due to opium poisoning. He found a quantity of crude opium in the stomach, and he thought she must have taken forty grains during the twelve hours previous to her death, whilst four grains was a fatal dose.

The jury returned a verdict of death from misadventure.—*Morning Post.*

### Suicide by Prussic Acid Poisoning.

An inquest was held on March 22, by Mr. Hussey, at Oxford, on the body of a young man, Joseph Edward Francis Lewis, son of Mr. Joseph Lewis, Supervisor of Inland Revenue, Preston Road, Brighton. Frank Fraser, clerk in the office of the London, Brighton, and South Coast Railway, said Lewis was a friend of his, and on the previous Sunday night they went to London by a late train, and went on to Oxford on Tuesday evening. They went on to Port Meadow, buying two glasses on the way. Lewis had a bottle of prussic acid, and said he should use the acid when he had spent all his money. When they were on the meadow at night he poured out some of the acid in each glass, witness having one and Lewis holding the other in his hand. Lewis half turned round and drank his, and when he had drunk it turned to witness and said, "Frank," and then fell, knocking witness down, and also knocking the glass out of his hand. Witness then ran off to get assistance. In reply to further questions, witness said that Lewis first spoke of the prussic acid on the Sunday night in the train. He did not ask witness to take the acid, but said he himself should take it. When they reached the meadow, Lewis poured out the acid and said, "We will shake hands and take it," but witness did not believe he meant it. Lewis said it had been found out what they did at Rottingdean, when they smashed the globes of oil lamps in church, and he thought they should get into trouble over it.—The coroner said that, in his opinion, the evidence would not justify the jury in returning a verdict involving a criminal charge against Fraser. A verdict of *felo de se* was returned.—*Standard.*

### Death from Overdose of Chloral.

An inquest was held at Northampton on March 20, on the body of Mr. Thomas Henry Merrick, ex-president of the Midland Counties Veterinary Surgeons' Association, who died on Monday as the result of taking an overdose of chloral on Sunday night to induce sleep. Evidence was given to the effect that the deceased suffered much from sleeplessness, and that he frequently resorted to chloral and bromide of potassium. The jury returned a verdict of "Accidental death."—*Morning Advertiser*

### Apparent Suicide by Prussic Acid.

On Tuesday night, March 20, a retired gentleman, named Thomas Alker, aged 72, living at Manchester Road, was found dead in bed under suspicious circumstances. Not having come down stairs at his usual hour, his landlady knocked at his bedroom door, but received no answer, and on going into the room discovered that he was dead. Two empty bottles were found on the dressing-table, labelled prussic acid, and it is supposed deceased had taken some of the poison, though there was no outward evidence of it. He had purchased half an ounce from a local chemist on Monday, saying he wanted it to poison a dog.—*Manchester Courier.*

### Suicide by Carbolic Acid.

On March 21, Mr. E. P. Jobson held an inquest at the Town Hall, Dudley, on the body of Naomi Lovatt, aged 23, daughter of William Lovatt, shingler, Bloomfield Road, Prince's End, Tipton, who committed suicide whilst on a visit to a cousin at Netherton by taking a large dose of carbolic acid. Dr. Griffiths deposed that he was summoned to the deceased, and found her sitting on a chair unconscious. He could see that she had taken poison, and he at once tried to make her vomit. Failing with an emetic he used the stomach pump, and at once came to the conclusion that she had taken carbolic acid. There was no hope for her life from the first, and she died next morning. She had taken about 5 ounces of the acid, whereas 1 ounce would be sufficient to kill. The jury returned a verdict of "Suicide whilst temporarily insane."—*Birmingham Daily Gazette.*

### Accidental Poisoning at Bearsden.

On March 23 a child named William Lindsay, aged three years, son of Hugh Lindsay, butler to Mr. James Thomson, shipbuilder, Clydebank, was accidentally poisoned. His mother, thinking that she was giving the child a dose of magnesia, took a packet containing salts of sorrel. Death ensued in about ten or twelve minutes, before medical aid could be got.—*Scottish Leader.*

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[*] This name does not appear on the Register of Chemists and Druggists for 1894.

### SUICIDE BY MORPHINE POISONING.

Mr. Troutbeck held an inquest on March 27, at St. Clement's Vestry Hall, as to the death of Martin Luther Brown, M.D., aged 37, who lived and practised at Exeter, but was found lying dead in bed at the Charing Cross Hotel on Good Friday. Dr. Mills, who was called in at 12.30 on Friday, said the deceased had then been dead many hours. He had taken enough morphia to kill half a dozen men. The coroner read a letter, in which the deceased said he was tired of life. The jury returned a verdict of "Suicide while of unsound mind."—*Standard*.

### CARBOLIC ACID POISONING AT HULL.

On March 23, the Hull police had reported to them the particulars of the suicide of Esther Snell, aged 37, wife of a labourer, residing at 4, Providence Place, Pease Street. On Thursday night she went to the house of a married sister in Adelaide Street, and whilst there asked her to go for a pint of beer. When she returned she found Mrs. Snell lying in an unconscious state on the kitchen floor. An empty glass and a bottle labelled "Poison" were lying beside her. Medical assistance was obtained, and emetics were administered, but she died a few hours subsequently. The bottle had contained carbolic acid, deceased having procured it by saying that she wanted it for disinfecting purposes.

At the conclusion of the inquest, Dr. Milburn said it was a serious thing that carbolic acid was not scheduled as a poison. There were deaths every week in England through carbolic acid poisoning, and there was an agitation going on at present to get the poison scheduled. He thought a recommendation from the jury would have some effect.

The jury thereupon recommended that the sale of carbolic acid be placed on the same restrictions as other scheduled poisons.—*Yorkshire Post* and *Hull Daily Mail*.

### OXALIC ACID POISONING.

At an inquest held on Saturday last, on Jessie Jones, of Hoxton, it was stated that the dying woman confessed that she had taken fivepennyworth of oxalic acid, which she got at a chemist's. The jury returned a verdict of "Suicide whilst of unsound mind."—*Morning Leader*.

### DEATH FROM OVERDOSE OF LAUDANUM.

Mr. F. Price, the county coroner, held an inquest at Ashton-under-Lyne, on Saturday last, relative to the death of Edward Dawson, aged 67, who lived at 47, Winton Street, Ashton-under-Lyne, and was a journeyman brush maker. Deceased suffered from rheumatism, chiefly in the shoulders, and on the Tuesday afternoon procured two ounces of laudanum at the stores of the Thompson Drug Company, Limited, 160, Stamford Street, Ashton, saying he wanted it for rubbing and bathing purposes. The chemist cautioned him that the stuff was a strong poison and ought to be used with care. Deceased afterwards went home, where he was found later in the day by his wife, who had been out of the house, lying on the floor upstairs in a unconscious condition. A doctor was at once called, and applied certain remedies. Early on the following morning two empty bottles were found which had contained laudanum, and the doctor stated that the deceased must have taken the contents of the bottles. The man never regained consciousness, and died at noon on the Wednesday. Mrs. Dawson believed her husband had taken the laudanum to ease the pain from which he had been suffering. The jury returned a verdict of "Death by misadventure."—*Manchester Courier*.

### SUICIDE BY PRUSSIC ACID POISONING.

On Sunday a man named James Sinclair, aged 23, was admitted to the Newcastle Infirmary, suffering from the effects of poison. He had quarrelled with some member of his family on Saturday night, and, taking up a bottle, drank a portion of its contents Dr. Hardy was a once sent for, but on his arrival the man was writhing on the floor in the greatest agony, the liquid taken being prussic acid. To the doctor he expressed his satisfaction at having succeeded in doing what he had done, and in spite of every medical expedient he became unconscious, was removed to the Infirmary, and died there not long after his admission to that institution.—*Newcastle Daily Journal*.

### SUICIDE BY CARBOLIC ACID.

On March 27, an old man named John Johnson, aged 63, who resided with his sister, Mrs. Anderson, at 38, Sterne Street, obtained a bottle containing carbolic acid at the shop of Mr. Leggatt,* chemist, Boaler Street, and proceeding to the entry at the back of the residence he took a dose of the poison. He was conveyed in an ambulance by police-constable B 69 to Mill Road Infirmary, where he was attended to by Dr. Gormon, but he shortly succumbed to the effects of the poison.—*Liverpool Post*.

## PROCEEDINGS UNDER THE WEIGHTS AND MEASURES ACT.

At the Macclesfield Borough Police Court on Monday, March 19, before Mr. Smale and Mr. Whiston, John Dale, chemist, Derby Street, was summoned for committing a fraud by using certain weights and a scale contrary to the provisions of the Weights and Measures Act, 1878. He was also summoned for having in his possession for use in trade six weights which were false or unjust.

Peter Brown, assistant inspector of weights and measures, deposed to visiting defendant's shop in Derby Street on March 7, and examining his weights and scales. The heaviest weight he could find was 4lbs. He seized the weights on account of them being without the Board of Trade mark. On testing them at the office in defendant's presence six were found to be deficient, varying from 1½ drachms to a quarter against the purchaser.

Samuel Barker, inspector of weights and measures, also spoke to six weights being unjust, and the only other weight seized was correct. One was undenominated.

For the defence Mr. Hastings said the defendant pleaded guilty to the weights being unjust. After a brief consultation the chairman said the case had been proved. The defendant would be fined £5 and costs in each case, or suffer two months' imprisonment. The scales and weights would be forfeited.

## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

### CHLORODYNE LOZENGES WITHOUT MORPHINE.

On Thursday, March 22, at the Lanchester police court, Durham, a case was heard in which Elizabeth Wilson, confectioner, Burnopfield, was charged under the Sale of Food and Drugs Act with selling linseed, liquorice, and chlorodyne lozenges, which contained no morphine, an essential ingredient of chlorodyne. After hearing the evidence, however, the Bench considered there was no case, and dismissed the summons, with costs.—*Birmingham Post*.

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* This name does not appear on the Register of Ch mists and Druggists for 1894.

# Reviews and Notices of Books.

### SECOND SYSTEMATIC CENSUS OF AUSTRALIAN PLANTS, WITH CHRONOLOGIC, LITERARY, AND GEOGRAPHIC ANNOTATIONS. Part 1. Vasculares. By Baron F. VON MUELLER.*

Seven years have elapsed between the publication of the first edition of the 'Census of Australian Plants' and the appearance of the second, but in this comparatively short period a number of species has been added to those already known, so that the second edition contains 194 more pages and 1025 more species than the previous one. Unfortunately the author, for some reason, has not published the second edition of uniform size with the first, so that a comparison is not easily made. The 'Census' consists of a list of the plants arranged under their respective natural orders, with a reference to their original description in Bentham's 'Flora Australiensis' and in Mueller's 'Fragmenta.' The distribution in the Australian continent is indicated by capital letters, and in the world by abbreviated words, *e.g.*, Afr., Eur., etc.

In the previous edition, Bentham and Hooker's 'Genera Plantarum' was followed, but in the present volume an attempt has been made to distribute the apetalous amongst the petaliferous natural orders. Although this arrangement may have the apparent advantage of keeping pace with the progress of knowledge, it has the great disadvantage of not being adopted in the standard works on English botany, and of consequently being very confusing to English botanists. The time seems hardly ripe for such a change when one finds *Nymphæaceæ* come next to *Piperaceæ*, and *Epacridaceæ* to *Coniferæ*. In a work of this kind, which must be used almost exclusively for reference, a saving of time is of great consequence, and with all due deference to the veteran botanist and author, it is to be regretted that this point of view has been neglected. An alphabetical arrangement like that of the 'Index Kewensis,' etc., would have been more useful, and have saved the necessity for an index, and for the tabulated sequence of the natural orders as given in the 'Census.'

On the other hand, the table indicating the number of species in, and the relative predominance of, the different natural orders is both valuable and interesting. From this table it would appear that Queensland heads the list with 3753 species, and then follow respectively West Australia with 3560, N. S. Wales with 3251, North Australia with 1956, Victoria with 1894, S. Australia with 1892, and Tasmania with 1029 species. *Leguminosæ* comes first on the list of orders, with 1065 species, then follow *Myrtaceæ* with 663, *Proteaceæ* with 597, and *Compositæ* with only 539. The *Ericaceæ* with only seven species are in strong contrast to the *Epacridaceæ* with 275 species, and the *Melastomaceæ* with only seven species, the *Guttiferæ* with three, the *Papaveraceæ*, *Ternstrœmiaceæ*, and *Hypericineæ* with only one each, show that the Australian flora is a peculiar one in some respects.

It is of great importance that an available record of all recently discovered plants should be published at short intervals, since even in such a valuable work as the 'Index Kewensis' it is impossible to keep up to the current date, that work terminating, so far as botanical records are concerned, in 1885. The records of four years of subsequent additions to the Australian flora will, therefore, have to be searched for in Baron Mueller's 'Census.' For this the thanks of the botanical world are due to the indefatigable and illustrious author.

### CONGENITAL AFFECTIONS OF THE HEART. By GEORGE CARPENTER, M.D.*

This is a useful little book on a very interesting subject. Malformations of the heart are rarely dealt with in a manner attractive to students. The book opens, as it should, with a lucid outline of the mode in which the heart and big vessels develop, and using the various stages as a basis of division, the author considers the more important defects in a categorical manner. The clinical, as well as the anatomical features of these cases are very carefully discussed and several interesting and typical examples of the various defects, given in detail from the clinical standpoint, make this work extremely useful, not merely to the advanced student attending a course of instruction at a hospital for sick children, but to practitioners in general, who are sure to meet with cases of congenital affections of the heart and big vessels.

### TRAITÉ DE CHIMIE MÉDICALE ET PHARMACEUTIQUE. CHIMIE MINÉRALE. By Dr. R. HUGUET.†

The author describes this work as an epitome of the lectures delivered by him during eighteen years, as professor of chemistry and toxicology in the School of Medicine and Pharmacy at Clermont-Ferrand. In the first place he deals with the classification of chemical substances, referring briefly to the periodic law, and quoting Crookes' remarks on the genesis of the elements. Nomenclature, symbols, formulæ, and various laws and theories, next receive attention, as well as thermo-chemistry, crystallography, etc. Several chapters are devoted to analysis, toxicology, descriptions of apparatus and their use, methods employed in chemical work, and the preparation of reagents. Commencing then with the study of oxygen and its compounds, the rest of the book is devoted to the study of inorganic chemistry as specially applied to medicine and pharmacy. Each substance is considered under the following heads:—natural occurrence, preparation, physical and chemical properties, characters, tests, adulterations, medicinal uses, pharmaceutical preparations, doses, etc. The book is well illustrated, and the information given in the text is very full, rendering it of great value to everyone interested in medicine and pharmacy as practised across the English Channel.

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* Melbourne; Printed for the Victorian Government, 1889. Pp. 244.

* London: John Bale and Sons. Pp. 1 to 108. 3s. 6d

† Paris: Baudry et Cie. Large 8vo. Pp. i.-xv., 1 to 1010, with 428 illustrations. 30 francs.

### THE STUDENT'S INTRODUCTORY HANDBOOK OF SYSTEMATIC BOTANY. By J. W. OLIVER, Lecturer on Botany and Geology, Birmingham Municipal Technical School.*

The author points out in the preface that this work is intended chiefly for students who have already passed through an elementary course, and for this reason he begins with the Cryptogams, and passes on through the Gymnosperms to the Angiosperms, so as to allow of a more distinctly biological treatment of the subject than would be possible by the reverse process. The author follows the modern method of classification, dividing the vegetable kingdom into Thallophytes, Bryophytes, Pteridophytes,, Gymnospermæ, and Angiospermæ. Nearly half of the book is devoted to the first three sections, because the author's experience as a teacher has shown him that it is mainly in the lower forms of life that the student most needs help. Also for the reason that in all the higher botanical and biological examinations a considerable knowledge of the Cryptogams is required, a somewhat full and detailed description of those typical genera which are used in these examinations is given. Examinations inevitably direct the line of education, and although opinions may differ as to the relative value of a knowledge of the Cryptogams generally as compared with the Phanerogams, there can be no doubt of the importance of an acquaintance with the life history of the Schizomycetes and parasitic fungi.

In dealing with such an enormous field as that of systematic botany, a bird's-eye view of the subject is of the first importance before attempting an acquaintance with the differences of species. The author has given this in a most admirable manner. In each group the salient points are selected with the greatest care and with the judgment that comes only of long practice in the art of teaching, and are presented in a clear and concise form, so as to be readily grasped by the student. The more important terms in each paragraph are emphasised by the liberal use of heavier type, so that the time of the student is saved when refreshing his memory upon work already gone through. The illustrations also are chosen with great care; the old mistake of giving figures of plants not easily obtainable has been avoided. Indeed, there is hardly a plant used throughout the book as an illustration which could not easily be obtained either in the country or in any botanic garden; and indications are in many cases given as to the kind of places and conditions under which the plants may be found. An explanatory chapter treating in brief of the chief differences, morphological and histological, of each group precedes the discussion of their systematic classification into orders, sub-orders, tribes, and genera. The summary given under each order of the chief economic uses of the plants belonging to it also bears evidence of very careful compilation and of excellent judgment in the species selected. In fact, the whole book bears the impress of the experience of a wise teacher, who endeavours to present a dry and somewhat unwieldy subject in the clearest and most condensed method possible to the student, so that he may be able to grasp the leading features before proceeding to a wider acquaintance with the more minute details.

Books on botany are numerous, but of all that have come under the reviewer's notice not one has presented the subject of systematic botany in a form so lucid, so orderly and so easily assimilated as the present little work, and with so evident a practical acquaintance with the subject and with the requirements of honest students. The only improvement that could possibly be suggested would be the adoption of the large groups or cohorts as given in Bentham's 'Genera Plantarum' so as to render the relationship of the natural orders more evident at a glance. Some very useful features often omitted in students' books on systematic botany are the indication of the number of known plants in each order, of their geographical distribution and of the relative importance of the different genera as regards their number of species. The influence of some of the works consulted (Henfrey's 'Elementary Botany') is evident in the discussion of the relationships of one natural order to another, and of others (Bentham's 'British Flora' and Hooker's 'Students' Flora') in the tendency to lump species, as when the author states (p. 202) that *Spartina* is represented by a single British species. In conclusion, it may be safely said that the student who carefully studies this book is likely to feel that he has secured a friend, and that he will value it accordingly. It is of a convenient size for the pocket, printed in clear type, and due prominence is given to the more important parts. It may be hoped that the author will reap the reward he so richly deserves for the care he has bestowed upon the production of so useful a book.

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### FOOD AND DRINK RATIONALLY DISCUSSED. By THOMAS DUTTON, M.D.*

This book is in reality a new edition of the author's work on 'Digestion and Diet Rationally Discussed,' and the text admirably conforms to the title. The whole of the useful information it contains is of service to the housekeeper, wife, doctor, and steward. How much misery due to disordered digestion, caused by stale meat and vegetables, or food improperly cooked, would be prevented if the housewife or intelligent cook followed the rules so simply expressed by Dr. Dutton. The chapters on vegetables and fruits are of great interest, and especially the remarks on greengrocers' shops in towns. It may be suggested that one of the most pernicious habits to which retail fruit and vegetable dealers are addicted is the mixing of stale produce with fresh, and selling the mixture as if it were of recent gathering. This is as truly adulteration as adding skimmed milk to new milk. There are many elaborate works dealing with dietetics as a science, but few treat it as an art. In this Dr. Dutton succeeds admirably, and he has written in a style so clear and simple that it is intelligible even to a scullery-maid.

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* London: Blackie and Son. Pp. i.-xvi., 1 to 366. 4s. 6d.

* London: Henry Kimpton. Pp. i.-vii., 1 to 134. 1s

## Obituary.

**Notice has been received of the death of the following:—**

**On March 2, William Robson, Chemist and Druggist, Scarborough. (Aged 71).**

**On March 10, John Edkins, Chemist and Druggist, Edgware Road. (Aged 50).**

**On March 15, Edward R. West, Chemist and Druggist, Dawlish.**

**On March 19, William H. Turner, Pharmaceutical Chemist, Oswestry. (Aged 60). Mr. Turner had been a member of the Pharmaceutical Society since 1854.**

**On March 21, Richard P. Chantler, Chemist and Druggist, of Luton. (Aged 50).**

**On March 23, Charles Batchelor, Pharmaceutical Chemist, of Fareham. (Aged 78). Mr. Batchelor was local secretary of his district, and had been connected with the Society since 1853.**

## Correspondence.

⁂ *No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only. Names of plants should be underlined, and capitals used for generic names only.*

### IMPURE CHLORIDE OF AMMONIUM.

Sir,—A sample of chloride of ammonium recently examined by me, when gently heated in a porcelain dish turned a rose-pink colour; the same colour was also produced when the salt was left exposed in a watch glass in the laboratory for the space of about twelve hours. A solution of the above in water gave a distinct red colour upon the addition of ferric chloride solution, the colour of which was not destroyed by boiling or by concentrated hydrochloric acid, but was immediately destroyed by the addition of mercuric chloride solution, phosphoric, or iodic acid. To a solution of about 60 grains of the salt containing ferric chloride solution were added hydrochloric acid and metallic zinc, and the mouth of the flask closed by a filter paper previously moistened with a solution of lead acetate; the paper in less than five minutes was of a brownish-black colour. The coloured paper transferred to a test tube, and hydrochloric acid added, gave a pungent odour of sulphuretted hydrogen, thus showing distinct evidence of the presence of sulphocyanides in the (so-called) pure chloride of ammonium. Several other samples have since been analysed, but no such impurity has again been detected.

*Birmingham.* H. S. SHORTHOUSE.

### PAPAIN AND ITS PROPERTIES.

Sir,—On page 684 of the *Pharmaceutical Journal* for February 3, 1894, reference is made, in a discussion on papain, to cattle being killed through eating papaw leaves, the papain in the leaves having perforated the stomach. On the following page it is suggested that the perforation was post-mortem. This is no doubt correct, and I think it very unlikely that the papaw leaves had any connection with the death of the cattle. Some years ago I had quite a grove of papaw trees; the green leaves and fruit were fed freely to my cow without any ill effect upon her health or the yield of milk. However, after a time the milk acquired an unpleasant flavour, and solely for this reason the papaw rations were discontinued. The papaw is generally credited with very strange and evil powers, which my observations lead me to think are either very inaccurately stated or grossly exaggerated. Yet it has power, which will, I consider, yet render it very useful in medicine.

J. J. BOWREY.

*Government Laboratory, Kingston, Jamaica.*

### OPIUM ASSAY.

Sir,—There are one or two points in Mr. G. Coull's instructive paper on "The Assay Processes of the New U.S.P." that require some explanation. The yield of morphine obtained from a tincture assaying ·805 by the B.P. method is increased to ·942 by the U.S.P. process. That is an increased yield of about 17 per cent. But when powdered opium is similarly assayed, Mr. Coull only finds a difference of 12·4 to 12·93, an increase of barely 5 per cent. It is generally admitted that the present B.P. assay process yields results at least 10 per cent. below the truth. Conroy found that only 9·04 grains of morphine were obtainable by the B.P. method from 10 grains. Smith obtained a yield of 9·63 from opium, by the B.P. method, which assayed 11·2 by Teschemacher and Smith's process. When we remember that the morphine obtained by the U.S.P. method is practically morphine hydrate, whilst the B.P. yields anhydrous morphine, it is evident that Mr. Coull would make the new assay method no better than the defective B.P. It would be interesting to learn the relative purity of the morphine obtained by the two methods; but whilst Mr. Coull agrees that titration of the precipitated morphine would be an improvement, he does not appear to have carried this out to its logical conclusion.

*London.* E. J. MILLARD.

### AN IMPERIAL "BRITISH PHARMACOPŒIA."

Sir,—That the conception of an Imperial Pharmacopœia, advanced by Professor Attfield before the Pharmaceutical Society at an evening meeting in London, exercises a degree of fascination highly attractive to the professional mind, was testified by speaker after speaker on the occasion referred to. The object of a volume to which this name would correctly apply is to provide a standard of remedies, simple or prepared, which shall be officially recognised in the United Kingdom, her colonies, and possessions. It can be accomplished by an extension of the British Pharmacopœia. But how shall the extension be made? This is the question put by Professor Attfield to himself and to others. A local appendix, applicable to each country, occurs to the mind naturally as a solution of the problem. But a little consideration decides, first, that it is unsuitable, and afterwards that it is unnecessary as well. The notion of it appears to depend on the supposition that there must be remedies indigenous to each state to which the pharmacopœia is to be extended, remedies which are specially useful in ailments which also are peculiar to the country. But is it so? By far the greater number of drugs officially recognised are the produce of our possessions abroad. Almost without exception one or more important drugs are sent to us from every spot which flies the British flag, the exceptions being small islands used as depots or coaling stations. They arrive at the very first with a reputation already made in the land of their origin, and having justified it here, after prolonged trial, are honoured with official sanction. Will it be necessary, then, after all to make many additions to the British Pharmacopœia to render it comprehensive and useful as an Imperial Pharmacopœia? I think not. One speaker argued at the meeting that as goods ordered from the outlying parts of the empire were mostly those included in the British Pharmacopœia, pharmacy there was very much the same as with us. The conclusion may be a fact, but *non sequitur*. No country would send to England for remedies produced within its own borders. India would keep the cardamoms she wanted, Australia her eucalyptus oil, and the Cape its buchu. So there may be remedies of value used in each of these and other places which have no reputation here. These, as they cannot be procured, are not ordered from here, and it is with reference to these that the inquiry will be made—Are they of sufficient importance to warrant their introduction into the Imperial Pharmacopœia? The Colonies will answer this question for the editor of the book, and no one knows better than Professor Attfield how to utilise the sources of information on matters medical and pharmaceutical in those distant places. The result of his labours—an Imperial British Pharmacopœia—will not, I think, be a very greatly enlarged volume, so far as its size is dependent on the admission of remedies peculiar to the Colonies and Crown possessions.

*Galen Works, S.E.* JOHN MOSS.

### THE PRESERVATION OF INFUSIONS.

Sir,—About fifteen years ago, when dispenser in a first-class London house, I always stored the infusions likely to be required during a week's dispensing in a manner similar to that described by Mr. Edmund White, in his paper read before the Chemists' Assistants' Association, but instead of using flasks I used six and eight ounce bottles. These, filled to the neck with fresh infusion, were placed in a tin vessel containing water, and the whole gradually heated to boiling point. The infusion now quite filled the bottles, and whilst in this state the mouths were carefully covered with tinfoil. The infusions, even if kept for weeks, did not show any signs of decomposition, and the flavour and aroma were all that could be desired. I have also proved that chloroform is a preservative in pharmaceutical preparations, notably in mucilage of acacia. Aqua chloroformi, as recommended at the British Pharmaceutical Conference, held at Leeds a few years ago, has been used by me ever since, instead of aq. dest. in this troublesome preparation, and, even in the summer months, the mucilage is all that a pharmacist requires.

*Milnsbridge.* S. STEPHENS.

⁂ As we understand the matter, the only points in Mr. White's paper claimed as novel are the use of sterilised vessels with cotton-wool plugs in place of corks, and the sterilisation of infusions in the cold by means of Berkefeld kieselguhr blocks instead of heating to boiling point.—[ED. *Pharm. Journ.*].

### A CORRECTION.

Sir,—The report in the Journal of the 24th ult. of what I said at the meeting of the Glasgow and West of Scotland Pharmaceutical Association, held on the 15th ult., anent the incompatibility of sodium salicylate and sp. ammon. aromat. and how to prevent it, was incomplete, in so far as it omits to say that "one grain of sodium hyposulphite in a six ounce mixture" containing sodium salicylate and sp. ammon. aromat. āā ℥iv. "kept it quite clear." Further, the colour reactions of the several bases were sherry, red-brown, and claret respectively. The president said he had met with the same difficulty, but not with the same combination, his mixture containing sod. salicyl. and pot. bicarb. Previously I had found that pot. carb. *plus* liq. potass. (the potash homologue of sp. ammon. arom.) had no effect. Since then I have found that the mixture mentioned by the President keeps perfectly, so that the discoloration he noticed was probably observed before physiologically pure sod. salicyl. was an article of commerce.

*Pollokshields.* THOMAS DUNLOP.

⁂ The report of Mr. Dunlop's remarks was published just as received.—[ED. *Pharm. Journ.*]

### ARSENIC IN GLYCERIN.

Sir,—There is another possible source of inaccuracy in applying the test described by Dr. Paul and Mr. Cownley, besides the impurity of the zinc. It is the presence, which I have sometimes detected, of traces of sulphurous acid in the glycerin of commerce. This would of course, just as in the case of sulphur in the zinc, cause the evolution of sulphuretted hydrogen and a consequent staining of the mercuric chloride paper.

*Birmingham.* JOHN BARCLAY.

### THE PHARMACEUTICAL SOCIETY.

Sir,—There can be no doubt that the anomalous position of the Society is largely due to the fact that pharmaceutical chemists only are eligible as members, and that members only have a voice beyond mere voting in the selection of the Council. Considering that the great majority of the members of the trade are chemists and druggists, and not Major men, it is only to be expected by them that, being the majority, they should have the most advantage in the management of the Society. Their subscription (except those not in business) is no less than that of members, and naturally they expect to have the privilege of putting forward for election those of their own rank, as well as merely recording their votes. It is only just that they should do so; otherwise they do not receive for their guinea the same value as the members. They therefore choose to spend their guineas to better advantage, and so the Society loses their support. As soon as the Society offers the same privileges to the majority of th trade as is now offered to the select few, it will becom really representative of the trade, and not merel officially so.

*Bristol.* C. E. PICKERING.

### BENEVOLENT FUND.

Sir,—Herewith I remit cheque for eleven shillings, bein the result of my sixpenny collection (see *ante*, p. 748).

HENRY WIGGINS.
*Divisional Secretary for Rotherhithe.*

⁂ The cheque has been handed over to the Secretary, Mr. Richard Bremridge.—[Ed. *Pharm. Journ.*].

### LIN. POT. IODID. CO.

Sir,—Kindly inform me through the correspondence column either what is the formula for, who is the make of, or who supplies "lin. pot. iodid. co.," which was thu ordered in a prescription, and the B.P. lin. pot. iod. c. sapone was not intended. ALPHA.

## Diary of the Week.

### MONDAY, APRIL 2.

*Royal Institution*, at 5 p.m.
General Monthly Meeting.
*Society of Chemical Industry (London Section)*, at 8 p.m.
"Colour as a means of Quantitative Estimation," by J. W. Lovibond.
"The Natural Diminution of the Dissolved Organic Matter in the Water of Rivers," by W. C. Young.
"Note on an Improved Specific Gravity Bottle," by H. Louis.

### TUESDAY, APRIL 3.

*Pharmaceutical Society of Great Britain.*
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.
*Royal Institution*, at 2 p.m.
"Electric Illumination," by Professor J. A. Fleming.

### WEDNESDAY, APRIL 4.

*Pharmaceutical Society of Great Britain.*
Council Meeting, at 11 a.m.
Pharmacy Club, at 7 p.m.
*Royal Microscopical Society*, at 8 p.m.
Conversazione at St. Martin's Town Hall.

### THURSDAY, APRIL 5.

*Chemists' Assistants' Association*, at 8.30 p.m.
Musical and Social Evening.
*Liverpool Chemists' Association*, at 8.30 p.m.
"Dispensing Notes," by T. S. Wokes.
"Pharmaceutical Organisation," by Dr. C. Symes.
*Linnean Society of London*, at 8 p.m.
"On the Aortic-arch System of *Saccobranchus*," by R. H. Burne.
"On the Orchideæ and Apostasiaceæ of the Malay Peninsula," by H.
*Liverpool Pharmaceutical Students' Society*, at 8.30 p.m.
"Six Months in a Parisian Pharmacy," by H. Wyatt, jun.

### FRIDAY, APRIL 6.

*Royal Institution*, at 9 p.m.
"Destructive Effects of Projectiles," by Professor V. Horsley.
*Quekett Microscopical Club*, at 7 p.m.
Conversation and Exhibition of Objects.
*Edinburgh Chemists, Assistants, and Apprentices' Association*, at 9 p.m.
Annual Supper at the Imperial Hotel.

### SATURDAY, APRIL 7.

*Quekett Microscopical Club*, at 3 p.m.
Excursion to Royal Botanic Gardens.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Brown, Long, Mee, Meldrum, Richards, Warrell.

The Pharmaceutical Journal.
FIFTY-THIRD YEAR OF PUBLICATION.

SATURDAY, APRIL 7, 1894.

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE COUNCIL MEETING.

THE additions to the Society at the meeting of Council last Wednesday comprise three pharmaceutical chemist members, eight chemist and druggist members, thirty-seven associates, and seventeen students.

For the election of fourteen members of Council next month, seventeen candidates have been nominated, and out of that number sixteen stand for election; the new candidates being Messrs. BATESON, CAMPKIN, and GOSTLING. The present auditors have again been nominated for election, and they have expressed their willingness to continue in that position if elected.

The chief features of interest in the report of the Finance Committee were the increase in the receipts on account of the Benevolent Fund, including a legacy of £500 left by the late Mr. BUCK, of Stamford Hill, the investment of a sum of £100 on account of the Orphan Fund, and of £500 on the general account of the Benevolent Fund.

On the recommendation of the Benevolent Fund Committee, one grant of ten pounds and three grants of five pounds each were ordered to be paid. Information of the legacy of £100 left by the late Mr. G. B. FRANCIS (see p. 779) has been communicated to the PRESIDENT.

As the result of a conference between the Library, etc., Committee, and the School staff, an alteration has been recommended and adopted by the Council in regard to the School of Pharmacy prizes. The restriction hitherto in force, by which students were debarred from competing for those prizes after having attended more than one course of lectures, is now removed. The restriction has not been found conducive to the object with which it was established, and consequently the reason for its maintenance has ceased to exist. Students will now have a greater amount of freedom to take advantage of opportunities that they may possess. If a student is able to attend two or more courses of the same lectures with the object of carrying off the prize, he will not be any the worse for such additional study, though those who compete with him may possibly be at some disadvantage. But it is unlikely that many would willingly make the sacrifice of time requisite for that purpose, or that many would have the opportunity of doing so, and that the ordinary course of procedure would be materially disturbed. The great object is to attract students to engage in work that will be of substantial benefit to them, and it is with that object in view the alteration now made has been advocated by Mr. ALLEN for several years with a pertinacity for which he was thanked by the TREASURER. Certainly, apprentices in London ought to be in a position of advantage in every respect, not only as to technical training, but also as to the possibilities of scientific education, and the alteration now made in the regulations as to competing for the prizes offered by the Council of the Pharmaceutical Society will contribute very largely to the inducements to make use of those advantages. So long as attention to educational requirements is a voluntary matter, it is of especial importance that every possible inducement should be offered. The hope that such inducements may be of a compulsory nature will be shared by all who take an interest in the future of pharmacy, but the realisation of that condition, according to the views expressed by Mr. MARTIN, is a development for which it is necessary to wait and also to prepare in every possible way.

Metropolitan members who have taken an active part in pharmaceutical affairs will learn with regret that Mr. WILLIAM GULLIVER has resigned his position as one of the Society's divisional secretaries. In accordance with the suggestion of members in his district his son, Mr. W. F. GULLIVER, has been appointed as his successor, and in the performance of the duties attached to the office he will have the advantage of his father's advice and assistance.

The report of Dr. STEVENSON on the Society's examinations was read by the PRESIDENT, and it furnished the satisfactory assurance that under the operation of the Pharmacy Act there is year by year a steady progress towards the result which the Society has always had in view for the advantage of the public—that of securing the scientific and practical knowledge of chemists and druggists.

The report of the Research Committee set forth the work that has been carried out during the past year in the Society's laboratory, mentioning also the acknowledgments of its utility which have been made by the offer of the Salters' Company to endow a Fellowship, and by the appreciative reference of the Royal Commissioners on the Gresham University for London. The PRESIDENT referred to these circumstances of recognition from outside as satisfactory indications of progress in the cultivation of intelligence that would be available for

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promoting the welfare of pharmacy. In the discussion of this subject some indications were afforded of a belief that pharmaceutical research can be prosecuted as a matter *sui generis* and without subordination to the broader principles of the sciences underlying such work. This is an old world notion belonging to the period when the Britisher prided himself upon the fact that he was a practical man, and fully believed that thoroughness consisted in doing just as his grandfather had done. Since that time we have learnt from the Germans that proficiency in practice must have a wider and sounder basis, that the more extended the knowledge of nature, the greater is the possibility of practical utilisation of that knowledge.

The report of the Law and Parliamentary Committee related prominently to a matter of great importance—the recommendation to introduce into Parliament a Bill for altering the constitution of the Society by making all legally qualified chemists eligible as members of the Society. This is a step in harmony with the prevailing sense of necessity for federation among chemists, and if it can be carried into effect it will provide for the possibility of such federation in the most perfect manner. It would also remove any ground for a prejudice which exists in the minds of many that there is on the part of the Society's executive a desire to maintain an artificial distinction between individuals who possess the same legal qualification. The rapid growth of the class of associates of the Society, natural as it appears at the present time, was not capable of being so easily foreseen at the period when the Pharmacy Act, 1868, was passed. Notwithstanding the compromise then made in regard to the standard of qualification, the hope was then still entertained that eventually every individual in the business would become a pharmaceutical chemist. Under the influence of that hope, the fact was lost sight of that the adoption of the Minor qualification as the legal standard required membership of the Pharmaceutical Society to be obtainable by all who held that qualification. This necessity has long been recognised by the Council of the Society, and repeated attempts have been made to provide for it, but having been associated with attempts to effect other legislative provisions of a more contentious nature they have hitherto failed. It is now decided to introduce a Bill into Parliament simply for the purpose of making legally qualified chemists and druggists eligible as members of the Society, as originally suggested by Mr. Sandford, and as that is merely a matter affecting the internal organisation of the trade and of the Society, there will be no ground for opposition from without, as there might be if the Bill also dealt with other matters, such as company trading, etc. The position of the pharmaceutical chemist will not be in any degree affected by the passing of this Bill. That will remain as it has always been, a distinction to be acquired voluntarily, and the provision for identifying the membership of the Society with legal qualification as a pharmacist is warranted from every point of view. In the discussion on the Bill, and on the amendment proposed by Mr. Harrison, all the arguments for and against limiting its provisions to the constitution of the Society were fully dealt with, and from the result arrived at it may be inferred that practically all the members of the Council are impressed with the opinion that the Bill should be supported as it stands, however much it may be the desire of some that it should have gone further.

The report of the General Purposes Committee gave particulars of the progress which has been made with cases placed in the hands of the Society's solicitors. Judgment has been recovered in some instances, in others penalties have been paid into court, and some cases are still awaiting trial.

Several cases of infringement of the Pharmacy Act were reported, and on the recommendation of the Committee proceedings were ordered to be taken.

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We are requested by Mr. Schacht to mention that his absence from the Council meeting on Wednesday was occasioned by his desire to attend the funeral of an old friend, Adolph Leipner, late Professor of Botany at University College, Bristol.

## THE PHARMACOPŒIA IN CANADA.

In the *Canadian Pharmaceutical Journal* for March, the editor, in referring to Professor Attfield's recent paper, which he republishes in full, states that in Canada the subject of an extension of the B.P. for colonial requirements is fully ripe for discussion. He also expresses the opinion that the pharmacopœia, as far as it goes, has proved quite satisfactory to all parties, but for Canada it scarcely goes far enough, since the influence of the United States is largely felt there, and its popular remedies find their way north. The hope is expressed that, now that the initiative has been taken by the Medical Council, every druggist in Canada will give the new pharmacopœia a permanent place in his thoughts, and from time to time commit the result of his deliberations to paper.

## SCIENCE PROGRESS.

The April number of this review (see *ante*, p. 810) contains a number of valuable contributions on the present position of scientific knowledge. In the first article, entitled 'Epigenesis, or Evolution,' G. C. Bourne discusses the outcome of the recent work of Weismann and others, and concludes that the ascertained phenomena of development presented by living beings and their order may be expressed by "epigenesis"—a doctrine due to Aristotle, but elaborated and definitely propounded by Harvey, which is simply a statement of observed and observable facts—though they cannot by "evolution" in its narrower sense. E. H. Griffiths summarises our present knowledge of the numerical value of the mechanical equivalent of heat, and suggests certain modifications of accepted figures. Recent researches on proteid metabolism by Pflüger and others are considered by E. H. Starling; the study of the evolution of igneous rocks by A. Harker; work on some of the lower Invertebrates, by T. J. Hickson; whilst Professor Goebel, in an instructive paper "On the Study of Adaptation in Plants," urges the revival of this branch of botany, which proved so fruitful a source of information in Darwin's hands.

## COMMISSION OF THE PEACE.

We are informed that the name of Councillor H. H. Pollard, Ryde (I. W.), Local Secretary of the Pharmaceutical Society, is included in the list of those who have recently been appointed borough magistrates.

# Transactions of the Pharmaceutical Society of Great Britain.

## MEETING OF THE COUNCIL.

*Wednesday, April 4th*, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Greenish, Grose, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Newsholme, Richardson, Southall, Storrar, and Young.

The minutes of the previous meeting were read and confirmed.

### ELECTIONS.

#### MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Merson, George | Newcastle-on-Tyne. |
| Moore, William | Felstead. |
| Riley, Joseph Arthur | Bradford. |

*Chemists and Druggists.*

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Abrams, Benjamin Robert | New Malden. |
| Hanson, George Henry | Newbury. |
| Harrison, Robert | Farnworth. |
| Henderson, Alex. Stevenson | Kirkcudbright. |
| Hindle, Henry | Blackburn. |
| King, Thomas Howes | Amersham. |
| Mays, Alfred | South Shields. |
| Weaver, Alfred Crowther | Wolverhampton. |

#### ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

*Minor.*

| | |
|---|---|
| Alexander, John | Glasgow. |
| Cameron, John | Inverness. |
| Emery, Robert Gordon | Stoke-on-Trent. |
| Forster, James | Musselburgh. |
| Harston, Charles Edward | Lincoln. |
| Hewitt, Frederick | Bolton. |
| Highton, Edwin | Blackburn. |
| Innes, John | Ballater. |
| Jackson, Oliver Lincoln | Blackpool. |
| Jones, William Forsyth | London. |
| Kenderdine, Alfred George | Bristol. |
| Lawler, Hugh | Milnathort. |
| Macdougal, David Grierson | Kilmarnock. |
| McGillivray, Finlay | Portobello. |
| Marshall, John David | Bournemouth. |
| Moore, Joseph Edward | Bristol. |
| Penman, Edward Wright | Jarrow. |
| Plews, Harry William | London. |
| Poustie, James Henderson | Galashiels. |
| Rees, Joseph | Mumbles. |
| Reid, David | Exeter. |
| Sewell, Edward Augustus | Bradford. |
| Shearman, John Samuel | Great Yarmouth. |
| Stewart, Alexr. Kennedy | Edinburgh. |
| Walker, George John | Lincoln. |
| Walklett, George James | Oxford. |
| Walton, Henry Egbert | Idle. |
| Wright, Joseph Newton | Reading. |

*Modified.*

| | |
|---|---|
| Kiddle, James | Bristol. |
| Shaw, John Wormall | London. |

#### ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Carter, Henry | Kendal. |
| Evans, Ivor | Aberdare. |
| Godsland, Wm. Henry Baker | London. |
| Herd, Thomas Smith | Stockton-on-Tees. |
| Ingall, Sidney Herbert | Ashford. |
| Moore, Thomas | Stirling. |
| Welsh, John | Chester. |

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

#### STUDENTS.

| | |
|---|---|
| Aves, Ernest Harold | Mansfield. |
| Blyth, Isabella | Sunderland. |
| French, Fredk. Alexander | Darlington. |
| Grayson, William | Pickering. |
| Hoyle, Herbert John | Landport. |
| Kent, Charles | Brighton. |
| Malins, Templar Edward | Newport, Mon. |
| Mitchell, John Andrew | Penistone. |
| Nicholls, Ralph | Devonport. |
| Oakes, Edwin York | Bridgnorth. |
| Pennington, John Richard | Worksop. |
| Smith, Margaret Alice | London. |
| Thomas, Francis M. W. | London. |
| Tutt, George Francis | Ashford. |
| Tyrell, Charles | Southampton. |
| Walker, William Henry | Hereford. |
| Wells, Louis John | Shipley. |

### ADDITION TO THE REGISTER.

Charles Benjamin Pratt Green, 47, Malden Road, N.W.,

having made a declaration that he was in business before the passing of the Pharmacy Act, 1868, and this declaration having been duly supported, his name had been placed on the Register.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a minimum restoration fee of one shilling.

### NOMINATIONS FOR COUNCIL AND AUDITORS.

The SECRETARY reported that he had received *seventeen* nominations to fill the fourteen vacant seats on the Council, and that the following *sixteen* had declared their willingness to accept office if elected:—

Abraham, Alfred Clay, 87, Bold Street, Liverpool.
Atkins, Samuel Ralph, Market Place, Salisbury.
Bateson, Thomas, 23, Stricklandgate, Kendal.
Campkin, Algernon Sydney, 11, Rose Crescent, Cambridge.
Cross, William Gowen, Mardol, Shrewsbury.
Gostling, Thomas Preston, Market Hill, Diss.
Grose, Nicholas Male, 8, Temple Street, Swansea.
Harrison, John, 33, Bridge Street, Sunderland.
Hills, Walter, 225, Oxford Street, W.
Johnston, John, 45, Union Street, Aberdeen.
Martin, Nicholas Henry, Northumberland Road, Newcastle-on-Tyne.
Martindale, William, 10, New Cavendish Street, W.
Newsholme, G. T. Wilkinson, 74, Market Place, Sheffield.
Richardson, Jno. George Fredk., Elmfield, Knighton, Leicester.
Schacht, George Frederick, 1, Windsor Terrace, Clifton, Bristol.
Storrar, David, 228, High Street, Kirkcaldy.

The following nominee had not expressed his willingness to accept office:—

Bourdas, Isaiah, 48, Belgrave Road, London, S.W.

### AUDITORS.

The Secretary also reported that he had received the following *five* nominations to fill the office of Auditor, and that all the nominees had expressed their willingness to accept office if elected:—

Butt, Edward Northway, 13, Curzon Street, Mayfair, W.
Lescher, Frank Harwood, 60, Bartholomew Close, E.C.
Stacey, Samuel Lloyd, 300, High Holborn, W.C.
Umney, Charles, 50, Southwark Street, S.E.
Yates, Francis, 64, Park Street, Southwark, S.E.

### REPORT OF THE FINANCE COMMITTEE.

This report was of the usual character, and recommended the payment of various accounts, also the purchase of £100 consols on the Orphan Fund account, and £500 consols on the Benevolent Fund donation account.

The PRESIDENT (as Chairman of the Committee), in moving the adoption of the report and recommendations, said the receipts during the month had been considerable, consisting largely of examination fees, and also of subscriptions. The payments were of the usual character, with the exception of the bill for printing the Calendar and Register, which would to a large extent come back again. With regard to the Benevolent Fund, the subscriptions and donations were getting more numerous as the year advanced, and the legacy of £500 (of which notice was received some time ago) from the late Mr. Buck, of Stamford Hill, had been received. Some small additions had been received to the Orphan Fund, bringing the amount in hand up to over £100, which it was therefore proposed to invest; and also £500 on the Benevolent Fund donation account.

The report was unanimously adopted.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£5 to an associate (39) and subscriber, who is in delicate health. He has had two previous grants. (London).

£5 to a registered chemist and druggist (54), formerly in business, and now seeking employment. (London).

£10 to the widow (64) of a pharmaceutical chemist member, who was for thirty-seven years in business. She is endeavouring to support herself by letting lodgings. (Edinburgh).

£5 to the widow (36) of an associate, who died recently, leaving her with a child quite unprovided for. (London).

One other case had been deferred for further information.

The VICE-PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations, which called for no special comment.

The motion was seconded and carried unanimously.

The PRESIDENT said he had received a letter from Mr. George Bult Francis, announcing that his late father had bequeathed a legacy of £100 to the Benevolent Fund.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Library.*

The report of the Librarian had been received, including the following particulars:—

| Attendance. | | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| February. . | Day . . | 416 | 28 | 12 | 17 |
| | Evening . | 205 | 20 | 6 | 10 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| February . . . | 256 | 136 | 120 | £1 12s. 9d. |

Donations to the Library had been announced (*Pharm. Journ.*, March 17, p. 780), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

*For the Library in London—*

Ince, Latin Grammar of Pharmacy, 6th ed.
Bousfield, Photomicrography, 2nd ed.
Stillé and Maisch, National Dispensatory, 5th ed.
Sohn, Dictionary of Active Principles of Plants.

*For the Library in Edinburgh—*

Ince, Latin Grammar of Pharmacy, 6th ed.
Sohn, Dictionary of Active Principles of Plants.
Pharmacopoea Helvetica, 3rd ed.
Tschirch and Oesterle, Atlas der Pharmakognosie.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| February . | Morning | 428 | 37 | 6 | 17 |
| | Evening | 54 | 7 | 1 | 2 |

Donations to the Museum had been announced (*Pharm. Journ.*, March 17, p. 780), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that a copy of the *Pharmaceutical Journal* be sent regularly to the Association Belge des Chimistes, which proposed to supply the Society with its own Bulletin.

The staff of the Society's School had attended, and reported on their respective classes.

#### *School of Pharmacy Prizes.*

After consultation with the School staff, the Committee recommended that in future all students connected with the Society attending a course or courses of instruction in the School be permitted to compete for prizes at the end of the course or courses, even if they have attended previous courses. No student, however, to be permitted to take the same prize in any class on more than one occasion.

### GIFT FROM MR. BOTTLE.

A letter from Mr. Alexander Bottle had been read, stating that he had sent to the Society a double-plate electrical machine for use in the lectures and demonstrations. The Secretary reported the arrival of the machine, and a cordial vote of thanks to the donor was passed.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. With regard to the School of Pharmacy prizes, the Committee having had a report from the staff, and having further discussed the matter with them, recommended that the Council should in future revert to the practice which obtained in early days. Some limitation had been put on the competition for these prizes, which was supposed to be beneficial to the School, and had been introduced about the time the short courses were introduced, when it was endeavoured to get two complete courses of instruction of five months each, a scheme which ultimately failed, as many thought it would. Certain alterations were then made which had not worked satisfactorily, and seemed to prevent the proper feeling of rivalry which ought to exist between all the students, whether an apprentice of seventeen only entering for one course, or whether he had finished his apprenticeship, and was attending all the courses. They were desirous of encouraging men to come not only at the end of their apprenticeship to obtain the benefit of the instruction which the Council placed at the disposal of all comers, but also, as far as possible, to encourage apprentices in London to attend courses of instruction in botany or materia medica one session, and in chemistry and physics another, and then finally to wind up with a complete course. These men had been discouraged by the fact that whatever small amount of attendance they had given previously, if they ever attended the school at all previously they were disqualified for the competition. This question of competition for honours was always difficult, and no one could say that any scheme devised was absolutely fair to everybody, but it seemed to him that in coming to the conclusion it had, the Committee had done what was best in the interests of education and the men themselves, and that whatever grievance one might feel at having to compete with a man who had been in a class one or two years before, he might console himself by the fact that he might set to work and go in for a prize another session. Mr. Bottle had presented the Society with a most excellent machine, such as was hardly purchasable now. It was a very valuable piece of apparatus, and they were very grateful to him for it.

Mr. **Hampson**, in seconding the motion, supported the alteration suggested, and took the opportunity of thanking Mr. Allen for the pertinacity with which he had pressed this matter forward. It was greatly due to his exertions that the change was recommended.

Mr. **Allen** said he should like to say a word or two on this matter, because it was one which had been in his mind for some years. The President had adverted to it as a reversion to the old order of things. At any rate it was a return to the state of things for which the School of Pharmacy was founded, viz., to give the best training to the young pharmacists and to encourage them to attach themselves to the Society for the longest space of time possible. Any change in the existing order of things which was likely to secure the attendance of even two or three apprentices in London at the class was distinctly for the better. It was not only for the good of the young men themselves, but ultimately of pharmacy and of the Society. According to the present regulations any apprentice who attended the class must compete for the prize at the end of the session, and consequently he had to compete against a number of men much older than himself, and the attendance at the elementary stages of those classes debarred him from any chance of obtaining the prize. This had had the effect of keeping numbers of apprentices in London from availing themselves of the advantages offered, and he would point out that this recommendation, if adopted, would have the effect of giving every London pharmacist the opportunity of training his apprentice in the technical portions of his calling in what he considered an ideal way. He had often heard it said that it was no use taking apprentices in London, because you could not train them properly. He considered that any man in London in a business of the ordinary kind had perfect opportunities for training young men, because the technical portion of their training could be obtained at a very small cost, and in a perfect way, at Bloomsbury Square. For many years London had been distinctly behind some parts of the country, where young men had had greater opportunities of acquiring pharmaceutical education, unless they chose to deprive themselves of all chance of obtaining prizes, which were no doubt a distinct encouragement to study.

Mr. **Martindale** said it was very necessary that young men during apprenticeship should have full opportunities of attending a course of systematic instruction either there or elsewhere, but if they knew they could not compete for prizes when they came to join the laboratory course of instruction afterwards, that of course operated to prevent their attending classes earlier in their career.

Mr. **Martin** said he agreed largely with what had fallen from previous speakers, but he hoped the day was not far distant when those following the calling of pharmacy would find it necessary during some part of their training to devote the whole of their time to obtaining a knowledge of those scientific subjects on which the calling was based. He did not think the scientific knowledge necessary to a pharmacist could be acquired in mornings or evenings, but those entering pharmacy should be prepared to devote their whole time for one or two years to a systematic study of the subjects.

The motion was put and carried unanimously.

### Divisional Secretary.

The **President** said a letter had been received from Mr. William Gulliver, of Lower Belgrave Street, who had been a most energetic and zealous divisional secretary for some time, saying he felt compelled to resign his appointment, but was quite willing to render any assistance he could to his successor. The members in the neighbourhood had suggested the appointment of Mr. W. Frederick Gulliver, the son, and he, therefore, moved that he be appointed.

This was unanimously agreed to.

### The Society's Examinations.

The **President** drew attention to the following report of Dr. Stevenson, the Government visitor, on the examinations, which he thought was most satisfactory, and showed the care with which Dr. Stevenson did his work.

"*Report on the Examinations held by the London Board of Examiners of the Pharmaceutical Society of Great Britain during the year ending March* 31, 1894.

"To the Lords of the Council,

"My Lords,—I have to report that during the year ending March 31, 1894, I have attended twelve examinations of the London Board of Examiners of the Pharmaceutical Society of Great Britain.

*First or Preliminary Examination.*

| | Numbers. | Percentages. |
|---|---|---|
| Candidates examined | 1472 | — |
| ,, who passed | 757 | 51·4 |
| ,, ,, failed | 715 | 48·6 |
| Failed in Latin | 454 | 30·8 |
| ,, ,, English | 586 | 39·8 |
| ,, ,, arithmetic | 438 | 29·8 |

"These statistics, when compared with those of the preceding year, show that the proportion of candidates who passed has undergone a considerable increase, and the number of failures in arithmetic has diminished by one-third.

"The attention of the Examiners and those concerned in the preparation of candidates has not been drawn in vain to the lamentable deficiencies of those who present themselves at this elementary examination.

*Minor Examination.*

| | Numbers. | Percentages. |
|---|---|---|
| Candidates examined | 833 | — |
| ,, who passed | 283 | 34·0 |
| ,, failed | 550 | 66·0 |
| Failed in chemistry | 245 | 29·4 |
| ,, ,, materia medica | 36 | 4·3 |
| ,, ,, botany | 38 | 4·6 |
| ,, ,, pharmacy | 39 | 4·7 |
| ,, ,, prescriptions | 52 | 6·2 |
| ,, ,, practical pharmacy and dispensing | 127 | 15·2 |
| ,, ,, obtaining aggregate marks for a pass | 59 | 7·1 |

"With a large increase in the number of examinees the relative proportions of passes and failures were practically unchanged; and the failures in chemistry were in about the same proportion as during the preceding year.

"The failures in practical laboratory work (186) were notably large. I have carefully followed this examination in the laboratory, and have assured myself that the chief cause of failure is defective systematic laboratory training.

*Major Examination.*

| | Numbers. | Percentages. |
|---|---|---|
| Candidates examined............ | 138 | — |
| " who passed ......... | 64 | 46·4 |
| " " failed ......... | 74 | 53·6 |
| Failed in chemistry and physics | 39 | 28·3 |
| " " materia medica ...... | 16 | 11·6 |
| " " botany .................. | 13 | 9·4 |
| " " practical work ......... | 16 | 11·6 |
| " " obtaining aggregate marks for a pass ... | 10 | 7·2 |

"The proportion of passes exhibits a creditable increase of seven per cent., and generally the failures in each particular subject have diminished. This is a gratifying result, since it has not been gained at the expense of thoroughness in the examination.

"Year by year the examinations in technical knowledge make steady progress towards the desirable result of securing more chemists and druggists of scientific and practical knowledge, with advantage to the public.

"I am, my Lords,
"Your obedient servant,
(Signed) "THOS. STEVENSON.
"*March* 17, 1894."

REPORT OF THE RESEARCH COMMITTEE.

"The Research Committee begs to present to the Council the following report on its work during the past year.

"The Committee has generally met once a month, and has received at its meetings periodical reports on the work of the Research Laboratory from the Director, Professor Dunstan, who has acted as Secretary to the Committee.

"During the past year there have been twelve persons at work in the Laboratory, and the majority worked during an entire session. Nearly all the workers have been pharmaceutical chemists; one was a pharmacist from Denmark, and another a pharmacist from California, who wished to gain special experience in alkaloidal work.

"The Committee has appointed Mr. Francis H. Carr Assistant Demonstrator in the Laboratory, Mr. E. F. Harrison being the Demonstrator. Mr. Thomas Tickle, late Bell Scholar, has been admitted as Redwood Scholar, and Mr. H. A. D. Jowett, B.Sc., through the kindness of the founder of the Manchester Pharmaceutical Association's Scholarship, as Manchester Scholar for the current year.

"Great progress has been made in the work of isolating and characterising the alkaloids of *Aconitum napellus*. Among the results recently obtained may be specially mentioned the observation that aconitine, when heated, loses acetic acid, forming a new alkaloid, pyraconitine; that aconitine may be readily converted into the non-poisonous "isaconitine," which is also an important constituent of the root. In this conversion it has been proved that acetic acid separates, consequently "isaconitine" must in future be known as "benzoyl-aconine," aconitine being "acetyl-benzoyl-aconine;" the demonstration that "picraconitine," an alkaloid first obtained by Mr. T. B. Groves, is slightly impure benzoyl-aconine. Some of these recent observations will probably render it possible to devise a plan for the separation and estimation of the principal alkaloids of *Aconitum napellus*, for the want of which the pharmacy of aconite has not hitherto been further developed.

"At the last Evening Meeting of the Pharmaceutical Society, Professor Dunstan delivered a lecture dealing with these new results, which have been recorded from time to time in the *Pharmaceutical Journal*, whilst papers on the subject have been published in the *Journal of the Chemical Society*.

"Several other investigations have also been carried on, and the constituents of two colonial medicinal plants have been examined, and will shortly be reported on.

"The following are the titles of the papers which have been published since the Committee's last report:—

'Contributions to our knowledge of the Aconite Alkaloids':—

Part VI. 'Conversion of Aconitine into Isaconitine,' by Professor Dunstan and Mr. F. H. Carr.

Part VII. 'Some Modifications of Aconitine Aurichloride,' by Professor Dunstan and Mr. H. A. D. Jowett.

Part VIII. 'On Picraconitine,' by Professor Dunstan and Mr. E. F. Harrison.

Part IX. 'The Effect of Heat on Aconitine. Formation of Pyraconitine,' by Professor Dunstan and Mr. F. H. Carr.

Part X. 'Further Observations on the Conversion of Aconitine into Isaconitine, and on the Hydrolysis of Aconitine,' by Professer Dunstan and Mr. F. H. Carr.

'The Isomerism of the Paraffinic Aldoximes,' by Professor Dunstan and Mr. T. S. Dymond.

'The Properties of α-Benzaldoxime and some of its Derivatives,' by Professor Dunstan and Mr. C. M. Luxmore.

"The expenses of the two last-named investigations have been defrayed by a grant from the Chemical Society.

"A paper by Professors Cash and Dunstan on 'The Physiological Action of the Nitrites of the Paraffin Series considered in connection with their Chemical Constitution,' of which the chemical portion deals with experiments made in the Research Laboratory, has been published by the Royal Society in the *Philosophical Transactions* for 1893.

"With respect to the financial position of the Laboratory, the increase in the number of workers, as well as the expensive nature of the materials needed, render it very difficult to meet the necessary expenditure out of the funds at the Committee's disposal. Last year there was a small deficit. This year, with the aid of a further grant of £150 from the Royal Society, and an extra grant of £50 from the Council of the Pharmaceutical Society, it has just been possible to meet the expenses.

"The Committee trusts that a grant may be received from the Royal Society during the present year to aid in the completion of the aconite enquiry.

"It affords much satisfaction to the Committee to be able to announce that the Salters' Company has decided to render an important service to chemical pharmacology. The Court of the Company proposes to offer a Salters' Research Fellowship of the annual value of £100, to be tenable for three years in the Research Laboratory of the Pharmaceutical Society by the worker who, in the judgment of the Director and of the Research Committee, is best fitted to carry on chemical research, especially in its relation to pharmacology. Everyone who is interested in the progress of scientific pharmacy will feel greatly indebted to the Salters' Company for this most opportune and valuable endowment.

"The Council will be gratified to learn of the acknowledgment which has been made by the Royal

Commissioners on the Gresham University for London, in their recent report, of the value of the educational and scientific work of the Research Laboratory. The Commissioners observe that 'for the study of Chemistry applied to Pharmacology there is an admirable but small laboratory at the Pharmaceutical Society, where, in addition to educational work, much valuable research has been done. It suffers much from want of funds, and requires extension, so as to provide for work which cannot, for want of space, be carried out.'

"The Committee considers it desirable to refer to the distinctions that two of the workers in the Laboratory, both pharmaceutical chemists, have gained during the past year at the London University. Mr. H. A. D. Jowett, who received a grant from the Manchester Scholarship Fund, has taken the degree of B.Sc., and Mr. C. M. Luxmoore, B.Sc., has been awarded First Class Honours in Chemistry, with a view to the degree of Doctor of Science.

"The Committee recommends that there should be issued at the end of the present year a second volume of collected papers from the Research Laboratory.

"M. Carteighe, *President.*
"W. G. Cross, *Vice-President.*
"T. Greenish, "G. F. Schacht, } *Members of Council.*
"T. Lauder Brunton, "Charles Ekin, "M. Foster, "E. Frankland, } *Additional Members of the Committee.*
"(Signed) March 6, 1894."

The President, in moving that the report be entered on the minutes, said he hoped it would be considered satisfactory, not only from the point of view of the work done, but also as showing that they had begun to make history, and to produce an impression as an important public body outside the sphere of the Society. The reference to the Report of the Royal Commission on the Gresham University for London, and to the fact that the Court of the Salters' Company proposed to found a Research Fellowship of £100 tenable for three years, was an indication also of the value of the work done. The Salters' Company were considering a scheme for advancing those forms of knowledge which were not dealt with in some of the larger schemes, and partly through the presence on that Court of one of their own members, Mr. Hill, and partly from the scientific and catholic spirit of the Court itself and its clerk, Mr. Scott, they were providing for a series of scholarships, one to be given probably in therapeutics and physiology in one of the hospitals—which might possibly be more or less associated with the Society—and enable them to get some of the articles which were prepared in a pure condition in the Research Laboratory examined therapeutically by a Salter's scholar in a medical school. On the whole he thought the work done might be regarded with great satisfaction, and its success might be estimated by the fact that the grant from the Royal Society had been repeated, and that there was a small grant also from the Chemical Society, showing that those competent to judge were of opinion that the work done was of capital importance. He and his colleagues on the Committee felt that they were fortunate in having in the laboratory former students of the School who had passed the Major examination, and who were such zealous workers that they were able to turn out very good work indeed. It was only those who had to plod during several months at a small piece of original work, which for a long time promised nothing, who could enter into the feelings of research workers, or realise the satisfaction which they felt when after perhaps four or five months they came upon a true grain of gold. An enthusiasm of this sort was essential to research work, and that enthusiasm was found not only in Professor Dunstan, the director, but also in all the workers in the laboratory, and they could heartily congratulate the director on the results. The chief difficulty of continuing the Research Laboratory and keeping up the working staff was in not always being able to give pecuniary assistance to the workers. Some of the best men often had parents and friends who were unable even to provide them with subsistence, and if they could receive a little assistance it was of great benefit. During the past year they had been fortunate in having special assistance from the Manchester Scholarship Fund, and particularly fortunate in having this grant from the Salters' Company. He knew of no greater benefit to the Institution, or to any young men, especially those of small means, than to be able after having obtained a Bell Scholarship, or passed their examination, to be able to get a bursary or some small assistance from some fund to enable them to pass at least one year in the Research Laboratory. In these days, in pharmacy and in manufacturing chemistry connected with it, what was wanted for success was not so much money as knowledge, skill, and brains. The Germans had been ahead of us in this respect, but it was very satisfactory to find that we were now producing men who, as far as pharmacy and manufacturing chemistry were concerned, would be able to some extent to compete favourably with German manufacturers. He moved that the report be received and entered on the minutes.

Mr. Martin seconded the motion. He said when he looked at the names attached to the report and listened to the speech of the President, he could not be surprised that the report should be received with a certain amount of awe and deference. They would naturally feel that they were only fit to sit at the feet of the Gamaliels of science whose names were appended to this document, but still they had a duty to perform to pharmacy, and to medicine through pharmacy, and he would venture to suggest to the Committee that the research carried on in this laboratory had not altogether that bearing on medicine which he thought would be of advantage. Some of them were distinctly of great advantage, and they were proud indeed of this research on aconite, although he was personally reminded of the wonderful results of the calculation which he remembered doing as a schoolboy as to the number of changes which could be rung on eight bells, and he wondered how many changes had been rung on the subject of aconite from the time of Groves, Williams, Alder Wright, and others who had worked on it. He was also pleased to see that the Germans were very busy in following the director's footsteps, but he had so much confidence in his powers that he had not the least doubt that truth would emanate from the Research Laboratory. But there were a number of other subjects mentioned, and the Committee would have assisted them if they had said what bearing the isomerism of the paraffinic aldoximes had on pharmacology or medicine. Two or three things occurred to him which still needed investigation. There was the chemistry of cinchona, and of ergot, which was certainly a drug of at least as great importance as aconite, and also ipecacuanha, which had been the subject of some discussion in the city during the last twelve months. Whilst he did not in the least wish to discourage the highest flights of philosophy or chemistry, he did think that the Pharmaceutical Research Laboratory should first and mainly devote its attention to substances which were used as medicines, and that this was not being done altogether in the opinion of the Committee and the director himself, was evidenced by the fact that the papers were read in connection with another society—the Chemical Society—and did not find their way originally and primarily into the *Pharmaceutical Journal* or to the Society's evening meetings. Of course, research was the basis and life of all true knowledge, but he did say that the funds of the Society should be mainly expended in the investigation of substances which were used as medicine in the treatment of disease.

The President said he was much obliged to Mr. Martin for his observations. They all knew, of course, the antagonism which existed between different branches of science, and that Mr. Martin was not very enthusiastic over organic chemistry. Many of the substances he had mentioned were on the list, but they could not undertake the work on more than one principal subject like aconite at the same time. The chemistry of cinchona and ipecacuanha no doubt wanted looking into, especially the latter; but with regard to the purely chemical part of the research which had been conducted, they were referred to as they had been done in the laboratory. The fact was that in working on one side of the subject, whenever the director came in contact with something interesting chemically, which served as an experimental research for a suitable assistant or pupil, he naturally gave it to him, and the paraffinic aldoximes had come out in that way. He thought it quite right that the laboratory should take credit for anything purely chemical as well as purely pharmaceutical. In fact, the whole question of pharmacology was based on a correct knowledge of the constituents of substances. He did not know that they had yet got at the bottom of aconitine, and the view that the Committee took was that the only proper way to investigate a drug was to get out its active properties, and find out its constitution. If there were any secondary results of interest to science, he was sure Mr. Martin would not deprive them of the opportunity of letting the students obtain some "kudos" for themselves. With regard to the publication of the papers, the substance of them was published in the *Pharmaceutical Journal*, but in regard to high-class work it was very difficult to get members of the Society to come to meetings of the kind, or to take any part in the discussion, much of the work being a little in advance of them. The main object of the publication of the works elsewhere was that they should become known all over the world. It was the custom of many societies not to republish their papers, and therefore the very object with which the laboratory was founded, that others should know what they were doing, was accomplished by such publication. They wanted medical men and scientific men and physicists who did not see the Journal to know what was done, that being the best way of producing such an impression on the intellect of Europe as would be of great service hereafter. If the papers were read before an evening meeting he feared they would not be found attractive, and would not be discussed. On the other hand, by following the course hitherto adopted, they were getting the history of the Society in its educational aspects recorded outside.

Mr. Atkins said he had only one observation to make of a general character, such as he made some twenty-five years ago, before the Research Laboratory was dreamed of. He did hope, if it were possible, that the final word on one great question might be uttered by the Research Laboratory; and he supposed it was possible — notwithstanding the reference to the number of changes which could be rung on eight bells—for some institution to pronounce finally on one definite substance. As long almost as he could remember, aconite had been the substance of doubt and inquiry, and he felt that if the Research Laboratory could finally settle the matter it would be a very great gain. To some extent he was in sympathy with Mr. Martin, because he thought the money expended by the Council should be largely, if not exclusively, devoted to research which had some bearing on pharmacy.

The President remarked that the things to which Mr. Martin had specially referred were investigated with the aid of the grant from the Chemical Society.

Mr. Hampson said he should be glad if in future the report of this Committee gave a little more in detail the receipts and expenditure. He would not go into the discussion which had been raised beyond saying that he was perfectly satisfied up to the present with the work done in the Laboratory.

Mr. Hills thought the members of Council were indebted to Mr. Martin for his remarks, for though he agreed with nearly every word said by the President, it was just as well that the views expressed by Mr. Martin, a known leader of the craft, should be on record, as they might act as a sort of curb on the Committee if they at any time were inclined to soar too high.

Mr. Martindale supported the view of Mr. Martin that pharmaceutical matters should be pursued more closely. The alkaloids of *A. napellus* had been dealt with, but there were still *A. ferox* and the Japanese aconite requiring investigation, and many other bodies, so that the field of pure pharmaceutical research was still very wide.

The President said the Committee would be much obliged for the advice which had been offered, but he thought they were all fully alive to the enormous extent of the field for investigation. Unfortunately neither the Laboratory itself nor the number of workers in it was expansible at pleasure. There were other matters in hand to which no reference was made in the report, simply because no definite results had yet been obtained—croton oil, for instance. He might say that Dr. Frankland, in a letter written after the last meeting of the Committee, said that, having regard to the number of workers, the amount of work turned out in one session was greater than he had ever known in any institution.

The motion was then put and agreed to unanimously.

### LAW AND PARLIAMENTARY COMMITTEE.

The report of this Committee recommended that the Committee be authorised to introduce into Parliament and proceed with the following Bill at the earliest convenient opportunity:—

## "A DRAFT BILL.

"INTITULED

"*The Pharmacy Acts Amendment Act*, 1894.

[*The object of this Bill is to render every person whose name appears on the Register of Chemists and Druggists eligible to become a Member of the Society. "Students" of the Society are to become "Associates," and the retirement of one-third of the Council every year is to be decided by rotation instead of by Ballot.*]

"1. In this Act—

The terms "Pharmaceutical Chemist" and "Chemist and Druggist" shall have the same meanings respectively as in the Pharmacy Acts; and "The Society" shall mean the Pharmaceutical Society of Great Britain.

"2. Every person who at the time of the passing of this Act has been duly registered as an "Apprentice or Student," and who, under the provisions set forth in Section X. of the Pharmacy Act, 1852, has been admitted into, and at that time remains in the Society as a "Student," shall be registered as an "Associate" of the Society; and every person who shall have been duly registered, or who thereafter shall become registered, as an "Apprentice or Student," shall be eligible for admission into the Society under that Section, and shall be eligible for election as an "Associate" of the Society.

"3. Every person who at the time of the passing of this Act has been registered as a chemist and druggist under the Pharmacy Act, 1868, and every person who thereafter shall become so registered, shall be eligible to be elected a member of the Society according to the bye-laws thereof, and shall thereafter be eligible for election to the Council of the Society, but the said Council shall not at any time contain more than ten members who are not on the Register of Pharmaceutical Chemists; and no person shall in right of membership acquired pursuant to this clause be placed on the Register of Pharmaceutical Chemists.

"4. In lieu of the provisions contained in the Royal Charter of Incorporation of the Society, whereby it is provided that two-thirds of the members of the Council shall in every year go out of office, the following provisions shall, after the passing of this Act, have effect:—

1. On the ordinary day of election of members of the Council in every year, seven members of the Council shall go out of office, and the vacancies shall be filled by election, the retiring members being eligible for re-election.
2. The seven members who go out shall be the members of the Council who have been longest in office without re-election.
3. If and whenever the number of the members of the Council who have been longest in office without re-election shall exceed seven, the members of the Council to retire shall be determined by lot.

"5. This Act shall not extend to Ireland.

"6. This Act may be cited for all purposes as the Pharmacy Acts Amendment Act, 1894, and shall be construed as one with the Pharmacy Acts, and shall come into operation on the first day of January, one thousand eight hundred and ninety-five.

"7. Sections 18, 19, and 20 of the Pharmacy Act, 1868, are hereby repealed."

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The PRESIDENT, in moving that the report be adopted, said this recommendation was the result of careful deliberation as to the desirability of proposing some form of legislation to secure the consolidation of the Society in the present session as soon as practicable. Many of their friends imagined that those on the Council were not anxious to trouble themselves with the many difficulties which occurred in the practice of pharmacy, some of which could only be removed by legislative means; but this was an entire mistake, they were as anxious an any one, only they knew that the time of entering the field must be determined with very great care. Some thirty-one years ago a bill was agreed upon containing several important provisions affecting the trade as a whole as well as the Society, and they all remembered the opposition it met with in various quarters, even in their own ranks. There was the question of the unqualified managers of branch shops, and the desirability that a person who had been so many years in pharmacy should be registered, although he had never passed any examination. Then there was a strong opposition to the curriculum, which it was said would increase the expense of entering the business, whilst the emoluments of pharmacy were not sufficient to justify its imposition. Those who carefully thought the matter out knew that much of this idea about the curriculum was fallacious. He had often pointed out that a compulsory curriculum would be a source of economy to the candidate and not an expense, but he feared that anything said in that place on this question was received with suspicion by many persons outside. Knowing that in the present state of parliamentary business there was very little hope of consideration for any contentious measure, the Committee proposed that a simple Bill for the consolidation of the Society should be introduced. The only interesting discussions during the last year or so had been on the question of the federation or association of local secretaries or local bodies, but there was only one sort of federation which seemed to be useful to chemists and druggists, and that was the corporate body represented by the Society. The more that body was subdivided in interest, the more you took away from it the co-operation of zealous and able men to join other bodies, the more chance there was of weakening the parent, and in these days you wanted the greatest amount of strength and unity, not weakening the parent body by many of the best men devoting their energies to other forms of progress. Their intention was good, but it was an open question, and a serious one, whether harm might not come from some of their propositions. There was no doubt that one of the defects of the voluntary part of the Society, as distinguished from that which was executive, in a legal sense, had been the fact that the Bill of 1868 was so altered during its consideration by the Council that on one vexed question—that of admission to a certain rank in the Society—a compromise had to be effected. There was a fierce contest on this question. The doors of the Society had been opened in 1853 to all persons in business who might become not only members, but pharmaceutical chemists. That was not very successful. It was said at the time that after 1854 or 1855 (as far as he could at the moment remember) the door would be shut, and that every future member of the Society, as well as pharmaceutical chemists, must pass the Major examination. When Mr. Sandford proposed the draft Bill in 1866 or 1867, it contained a clause that all who had been registered as chemists and druggists, whether by virtue of being in business or by passing the Minor examination, should become full members of the Society, and the Council supported it. He (the President), Mr. Brady, and Mr. Evans, who were then, he thought, the only three examined Major men, were the most enthusiastic supporters of that clause, but their friends in the Society who were not on the Council objected. A great opposition was got up, and eventually, for the sake of union, and to prevent wrecking the Bill, the clause was modified so that only those in business at the time of the passing of the Act should become members of the Society, and Minor men coming in afterwards were only entitled to become associates in business. He could not forbear to notice how far-seeing Mr. Sandford had been in this matter. He never would assent to the compromise, and voted against it to the last. He said then that the Minor examination of that day would not always remain as it was, that it would be progressive, and that in a very short time the Minor examination would be a qualification deserving of recognition of full membership of the Society. That being the history of the case, the Council was bound to make the desired change, recognising the character of the examination as at present conducted, and remembering that many men, by accident or otherwise, were not able to pass the Major. The Council had from time to time publicly announced that its sympathies were with these men, and regretted that it was obliged to go to Parliament to make the desired change, as if it had been a question of bye-law it would have been done long ago. With these feelings it commended this Bill for acceptance. Under it every person who had passed the Minor would be eligible to become a member of the Society, and to have all the privileges of membership. Of course, the title of pharmaceutical chemist would remain as at present. The qualification was not being in business, but registration by virtue of an examination. There were numbers of men who were not in business, and never wanted to go into business in the ordinary sense, but whose assistance in the Society would be of incalculable benefit. The only other alteration, which was a comparatively small one, had reference to the election of the Council, which provided that one-third should go out of office each year. The present method of drawing by lots was a form which was perhaps devoid of logical defence, and it did not always work satisfactorily. All the members, say from Scotland or from London, might have to retire at one election, though he did not say that was likely to occur. Moreover, he thought it was right that if members wished to change the Council they should do so first by turning out seven old members, and in doing that they would probably indicate to those acting for them on the Council where they were going wrong. If it were only a passing wave of feeling the Council might take such notice as might be necessary without carrying out any definite policy, but on the other hand, if the reasons for this change on the part of the electorate were of a kind deserving of attention, he felt quite sure that every Councillor would feel bound by the views so expressed. The question of having a majority of fourteen against seven was not of much moment; in a Council like that the majority was only a formal way of getting at the expression of opinion. They endeavoured to take counsel together in all matters, and he hoped for all time to come they would recognise the fact that they did all agree on certain general principles. It was not a question of parties, as in the House of Commons and elsewhere, but they were all there to work to the best of their ability for the good of the whole Society.

Mr. HAMPSON, in seconding the motion, pointed out that in the Bill of 1891 this enfranchisement clause was contained, but the important point was that there was no chance at present of passing any Bill other than this. This was an effort not only at consolidation, but at putting their own house in order, and it appeared to him it would enable them in future, if the opportunity occurred, to extend legislation in the direction already proposed.

Mr. ATKINS said after the explanation of the President, he intended to vote for this motion. He had rather opposed it in committee on the previous evening, believing that there was not much chance of its passing, but he certainly should not add to its peril by voting against it.

Mr. MARTINDALE said he would like to give his hearty support to the Bill, although he did not like clause 4. There had been no general demand for any alteration of this kind, the present system had not been found unworkable, and he saw no necessity for alteration. At the same time, he should not oppose the Bill on that ground. He was afraid the members had not quite understood the effect which would be produced. One effect would be there might be a matter before the Council on which the members outside were antagonistic to the views there held, and if fourteen went for election there might be a possibility of a majority being returned totally against the views held by the Council, and in that way they had an opportunity of making their will effective in one year rather than in two. It seemed to him this was a constitutional alteration far greater than the disestablishment of the House of Lords, and that it was hardly necessary; but however, if the members accepted it with their eyes open, and saw clearly what the result would be, he should not divide the Council upon it.

The PRESIDENT pointed out that he had discussed this clause all over the country four years ago, and, as far as he could judge, the majority of opinions was in favour of it. It had never been put forward in any way so as to throw dust in the eyes of the members.

Mr. HARRISON said he entirely agreed with very much of what had been said by the President, and nobody was more deeply impressed with the great advantage it would be to pharmacy if the members of the trade could be all joined together in one compact body. He felt more and more that the source of their weakness was disunion—they seemed to want that power of cohesion which other bodies possessed, but at the same time he could not say he was satisfied that they ought to proceed with a measure of this kind at present. It seemed to him that in the presence of the many grave difficulties with which they were now surrounded this was but a very poor attempt at legislation. Their members had been looking for years for some strong efforts to be made by the Society in favour of promoting their interests and those of the public, because, after all, it was useless to go to Parliament to ask for protection for themselves. The only thing they could demand in legislation was that the interests of the public should be protected, which they said could only be done by strengthening the Pharmacy Act of 1868. When their members had been looking for some redress for some of the great grievances under which they were suffering, it seemed a very small thing to offer them this, which, after all, was simply the consolidation of the Society, that would in no way affect their daily lives, or the manner in which they carried on their business. The principle of the Act of 1868 was sound and good, but the clauses under that Act were so weakened by compromise that they did not fully carry out that principle, and they ought, if possible, when the proper time came (he was far from saying that this was the proper time), to go forward to Parliament and show precisely what was required to make that Act as perfect as its promoters intended it to be. He did not think the Act represented either the feeling of those who promoted it or of Parliament which passed it. He believed there were several clauses in it which, had Parliament seen what the ultimate effect would be, would never have passed. He could not, therefore, give his support to the resolution, which simply asked them to go forward with this Bill and left all the other grievances unnoticed. After all, he was not sure that—unless some policy were adopted which showed that it was to the interest of members to come in and support a policy they believed in—the fact of making it easy for them to come in would attract them. Possibly he might be wrong, time only would show, but he had grave doubts about it himself. He therefore with some reluctance proposed the following amendment:—"That this Council, whilst recognising that the Bill now before it would be a distinct advantage by promoting the consolidation of the Society, yet having regard to the many grievous anomalies which weakened the effect of the Act of 1868, is of opinion that it is not expedient to attempt any further legislation until the whole question of the amendment of the Bill can be considered."

Mr. MARTIN said he rose with a considerable sense of responsibility to second the amendment. He did so, though he was entirely in sympathy with the Bill proposed, and agreed with almost every word which had fallen from the President. His remarks with regard to the division of the Society by smaller associations existing throughout the country were worthy of serious consideration by every registered chemist and druggist, and they were very much indebted to him for the history he had given of the passing of the Act and the part Mr. Sandford played in it. Personally, he thought every man would rejoice to see every chemist and druggist a member of the Society; but when

Mr. Hampson talked about the enfranchisement of them, he said they were already enfranchised, if they chose to take up the franchise. There were over 2000 pharmaceutical chemists competent to sit on the Council, and only twenty-one were required; but the number of candidates anxious to come forward did not lead one to suppose that any large number of those outside were eager for that particular form of expression of their franchise. They could stand aloof and criticise and grumble, and they did so, and that did an immense amount of harm, and the only possible way in which they could do good was to come into the Society in that capacity in which they were qualified to join at present. The principal consideration which led him to second this amendment was his extreme regret that it was thought necessary to go forward with a Bill which left out of sight the training of the future candidate for examination. Every member of the Council was pledged by his frequently expressed conviction, and the Society was pledged by a decision arrived at after prolonged discussion, to the opinion that systematic training was absolutely necessary as the prelude to examination. This was so in all other societies which were concerned with examinations, such as the Institute of Chemistry. The medical profession had gone on increasing the period of training from three years to four and from four to five, and here were they, professing to be an examined and educated body, and up to the present they had no power to insist on that education being given in a systematic manner. The question of company trading to which Mr. Harrison alluded was so full of anomalies that it ought to arouse a large amount of enthusiasm, and they ought to be able to show Parliament that it was in the interests of public safety that amendments in that direction were required. With regard to the jury service, he knew the President held that that could not be meddled with in a Pharmacy Act, but he thought something might be done. Personally, he considered it a disadvantage that he was disqualified by Act of Parliament from jury service, but he thought it was possible to insert a clause which would put it in the power of every registered chemist and druggist who was responsible for the sale of poisons to the public to claim exemption if the necessities of his business required it. He thought they could show an extremely good case for such a provision, because they submitted voluntarily to a large amount of service in the interest of the public which the public did not dream of. Was it to be supposed that for the sake of sixpence or a shilling a chemist was ready to answer the door at any time at night and all day on Sundays? It was simply done because of a strong sense of duty, and the risk inseparable from a pharmacist's calling, that the hours he was absent from his shop some critical case might arise, and Mr. Gladstone or Lord Salisbury might be in imminent danger of his life in consequence of the pharmacist being absent from his duty. There was, therefore, strong ground for saying that the chemist or druggist who thought it necessary should be exempt from jury service if he claimed it, and the number of people withdrawn would be extremely small relatively to the population.

The Vice-President said he had to thank the last two speakers for converting him from the position of apathy which he took last night in not voting for the introduction of the Bill, into the position of one who would heartily vote for it. Most of them, when they set about to do some great thing, first of all took care to put their house in order, and he looked upon this Bill as a preliminary of that sort without going into other matters. It was evident that if they went to Parliament they must go with as great force behind them as possible; and as he had said before, he did not know that it was well always to concentrate your efforts on big things. He thought one of their great faults was that they did not go often enough to Parliament: they did not make themselves felt. He had heard it said that a member of Parliament did not care a snap of the fingers for pharmacy, and perhaps that might be traced to the fact that pharmacy did not obtrude itself frequently upon them. It would be decidedly wise, if there were any chance of this measure being passed, to introduce it as soon as possible, and then there would be no excuse for members of the trade holding aloof. They could then be invited to join the Society with the prospect of seeing their ideas carried out. With regard to clause 4 he considered it was in accord with modern legislation and common sense. It would be little short of disaster if fourteen new men were substituted for fourteen old ones suddenly, and the policy of the Society changed in a moment. One half of the grumbling that existed amongst chemists was owing to their imperfect knowledge of the work done there. He always found when he got amongst three or four pharmacists, if there were one or two distinctly hostile to the Society, when he explained matters to them they readily came to agreement, and ultimately felt inclined to join. That was the real secret of those schemes of federation to which the President had alluded, and the recrudescence of such schemes time after time was, he thought, a healthy sign. No doubt it was a sad thing that throughout the country a lot of associations had sprung up from time to time and died of inanition, and it was also a cruel thing to think that many earnest, capable men associated themselves together to form associations, each going on its own way independent of any other body, and very often the association in one town adopting an entirely different policy to that in another. If men of that class could be brought together, much good would certainly result. The matter must be settled in some way, but if they could bring themselves into touch with local associations more, he felt sure they would be brought closer together. Whether that was to be done by the federation of local associations or by the creation of local branches of the Pharmaceutical Society he did not know, but something would have to be done in order to bring the country and metropolitan chemists more in touch with what was being done than they were at present. He hoped the Council would pass this resolution by an overwhelming majority.

Mr. Hills said he could not claim that he had been converted by the speech of Mr. Harrison and Mr. Martin, because he was already strongly in favour of the Bill going forward, but they had not converted him, for he could not see anything in the arguments they had used which should prevent their pressing forward this Bill with as much haste as possible. The idea underlying the Bill was the removal of disability, and they were all in favour of that. He took it that the opponents of the Bill merely said this: "This ought you to have done, and not leave the other undone." His opinion was they should do all they could to promote union first, and then go for something else afterwards. Mr. Harrison did not go into particulars, but they knew perfectly well the grievances which were running through his mind. He disagreed with him with regard to the Pharmacy Act, 1868, although that Act by the interpretation of the law courts had been very much altered from its original intention, still, on the whole, those interpretations had been in favour of the registered individual. Although, from the capitalist point of view, some of these judgments had been regarded with disfavour, and very naturally, they had been greatly in favour of the registered individual, and if registered individuals would combine with other registered individuals and unite all through the country, they would have the whole thing in their hands. Moreover, he thought public opinion was not going to be altered in the particular direction to which Mr. Harrison probably alluded. One of the principal reasons why Mr. Martin did not support this Bill was that it did not contain any clause providing for a compulsory curriculum. On that point he thoroughly agreed with him, but he thought it was a right step to try to get union first, and then, if he were on the Council, he should be glad to do all he could to help forward a Bill which would involve that principle of the curriculum.

Mr. Richardson said, after the elaborate discussion this matter had received in committee, although there were many dissentients, he did think they would have been unanimous in supporting this very small, but very important Bill. It occurred to him that in municipal matters before the November election there was generally some important controversial matter brought forward on the councils of the different municipalities, and it looked as if the mover and seconder of this amendment wanted to stand well with their constituents.

Mr. Harrison said he was not responsible for the introduction of this measure at this time.

Mr. Richardson said the simplicity of the Bill was, to his mind, its great recommendation. The previous evening he divided the Committee on the question of inserting a clause with regard to jury service, which he knew would be a very important boon to the bulk of their constituents, but if the Bill were loaded with all manner of controversial matters such as Mr. Harrison alluded to, it would be wrecked on the very threshold of the House. On the other hand, if they could pass this Bill it would be the first nail in the coffin of the stores and all those other matters which were a great annoyance, not only to the Council but to all in the trade. It did not follow that they would be satisfied with this small Bill; they wanted to create an enthusiasm amongst the constituents which up to the present time did not exist. Under this Bill associates would become members, and would be eligible to come on the Council, and this, no doubt, they would feel to be an immense change. Although they could vote for councillors, many of them could not sit as members. He remembered some years ago there was a great stir in Scotland, and one man was very anxious to come upon the Council, but it was found he was not qualified, much to the annoyance of his friends. If this Bill were passed that gentleman would be able to come on the Council. As to the retirement by lot, which Mr. Martindale was so much in favour of, he thought that had been considered a relic of the barbarous past for twelve or fifteen years, and they had only been waiting for an opportunity to sweep it away. He hoped the amendment would be withdrawn, and the Bill be unanimously supported.

Mr. Newsholme said it was quite unnecessary to go into the details of this Bill, as even the two gentlemen who moved and seconded the amendment were in favour of it; but he had been much pleased to hear what the President said with reference to Mr. Sandford, for it was new to him to find that that gentleman took so strong a view of the matter, and it was all the more gratifying as it was the view which he had always taken himself. The time had never been opportune up to now for bringing it forward, but it seemed to be so now, and it was the first step to consolidate the Society. There were many men holding important positions all over the country—one in particular he might refer to, who was a valued officer of the Society in Scotland—who were not at present eligible for a seat on the Council, though very well fitted for such a position. If Mr. Harrison or Mr. Martin could show how it was practicable to deal with the other matters to which they had referred, there was not a member of the Council who would not go with them; but at present, as they all knew, it was absolutely impossible. He heartily supported the motion.

Mr. Allen was quite unable to agree with the amendment. He regarded it as most important to obtain the entire consolidation of those engaged in pharmacy, but at the same time he had quite as ardent a desire to see certain reforms in pharmacy attempted as anyone. The only difficulty was that the introduction of any controversial matter into a Bill would tend to wreck it. There was a great feeling on the part of associates in business that such a reform should be introduced. A day or two ago he read in a contemporary journal a prize essay on "Some reforms in pharmacy, and how they may be best attained," and the first reform suggested was the complete union of all the members in one body corporate, and in working out the suggestion it described exactly what this Bill contained. He thought the present mode of fixing who should retire from the Council very objectionable and disturbing to the minds of those elected, as they did not know how long they might be called upon to serve; under the new mode they would serve for three years certain. The present method had been objected to often, and he thought the retirement of seven each year was quite sufficient to provide for a change of policy if it was desired by their constituents.

Mr. Young drew attention to one or two remarkable statements which had been made in the course of the discussion. The President had described the Bill as being of a democratic tendency, and Mr. Martindale objected to it because it was not possible under it to produce such revolutionary results as under the present system. He should certainly support the motion. The Bill did not contain many provisions which he would like to see in it. They all knew what a popular Bill would be like; it would be very easy to draw, but it was no use crying for the moon, or attempting that which was practically impossible. This was a step in the right direction; it was the right thing to give people the franchise, whether they exercised it in the best manner possible or not. The opponents of the motion had not shown how the Bill could do any harm, and on the ground that it would do some good, and pave the way for further improvement, he would support it.

Mr. Storrar said he would support the amendment, although in committee on the previous evening he had refrained from voting either way. Since then he had asked himself whether the Bill was worth all the trouble and expense which it was sure to involve, and he thought it was not; and secondly, whether it would have the effect which its friends anticipated, and he could not believe that it would. He had had some experience in canvassing on behalf of the Society, and he did not believe this would induce men to join who now stood aloof. What they wanted was some indication of a more forward policy being pursued after they joined. He quite agreed that they could not go forward with a big Bill just now, although the safety of the public was much more important than Home Rule or a House of Lords Bill, but it did not bring votes, and therefore the authorities would not trouble themselves about it; they simply took up questions which brought them votes. Even if they went with this Bill, he thought there was very little chance of getting it through.

Mr. Bottle believed this Bill, as far as it went, was one of the most liberal productions which in some thirty-five years he had ever heard read at that table. It was an advance on the 1891 Bill so far as concerned concessions to men outside the membership of the Society, for it opened the door not only to some 1544 associates in business, but also to a considerable number more who were not in business. He rejoiced very much at the liberality which the members of the Council had shown in this direction. It would lead to consolidation of the Society, and in consequence of that consolidation he was hopeful of much greater things in future. He would have liked to see the curriculum added to the Bill, and also the jury clause and other things, but they all knew that to do so would undoubtedly wreck the whole thing. What they asked was very simple, and he thought it would be a grand thing in the interest of the Society. He would therefore support the Bill to the utmost of his power.

The **President** said he need say very little in reply; it was a question of judgment whether they should go forward with this modest Bill or not. It must not be supposed that those who were in favour of this Bill were not as warm supporters of every part of the former Bill, especially the curriculum, as anyone else, simply because they were not pressing it at the present moment. What he wished to impress on Mr. Richardson and others was that it was impossible to put a jury clause into a Bill which was to amend a Bill which contained no reference to juries. The Dentist Act was a primary Act, and contained a jury clause, but in the Pharmacy Acts of 1852 and 1868 there was no reference to juries, and therefore is was *ultra vires* in an Act amending other Acts to introduce such a clause. That was the technical difficulty. What they had promised the members and associates to do was to watch for a Registration Bill, or any Bill which was brought forward in the House for this purpose in the case of any other class of persons, and then to go for an amendment of that Bill to include chemists and druggists. That was the only way in which it could be done. On other points he need say nothing more than this, that if a Bill of this kind could be passed in the lobbies, where Bills of this sort were practically passed, it would be pretty certain to pass the House, and amongst the younger generation, who were the greatest supporters of the Society at the present moment, there would be a considerable increase in the fighting power of the Society.

Mr. **Martindale** said he supported the Bill simply as an instalment.

Mr. **Southall** said he would support the Bill, although sorry they could not go farther.

The amendment was then put and negatived.

The original motion was put and carried *nem. con.*

### Leicester and Leicestershire Chemists' Association.

A communication from this Association was read, stating that owing to the establishment of classes for the study of chemistry, botany, etc., in connection with other institutions in the town, and to other causes, it had been compelled to cease its operations.

### Report of General Purposes Committee.

This report, which was read and considered in committee, included the usual letter from the solicitors stating the progress made with cases placed in their hands. In some cases judgment had been recovered, in others defendants had paid penalties into court, and one or two were still awaiting trial.

Several fresh cases of infringement were reported to the Committee, and proceedings were recommended.

On resuming, the report and recommendations were unanimously adopted, and resolutions were passed authorising the Registrar to take proceedings against the persons named.

## EVENING MEETING IN EDINBURGH.

*Wednesday, March* 28, 1894.

MR. J. LAIDLAW EWING IN THE CHAIR.

The fifth evening meeting in Edinburgh of the present session was held in the Society's House, 36, York Place, on Wednesday, March 28, at 8.30.

The minutes of last meeting having been read and approved, apologies for absence were intimated from Dr. S. Rideal and Mr. J. B. Stephenson.

The following communication was then read:—

### Some Notes on Papain Digestion.

BY DR. S. RIDEAL, F.I.C., F.C.S.

The recent papers by Dr. Sharp, communicated to this Society, raise some new points in connection with the digestive action of papain, which renders further work on this subject desirable. The formation of peptones in papain digestion is after all more a matter of theoretical than practical importance, especially as past work with this ferment undoubtedly shows that it has a very energetic solvent action on solid proteids in neutral, acid, and alkaline solutions. It is somewhat unfortunate that terms used by different writers have not been very rigidly defined, and that from our present knowledge of the albumoses and peptones being far from complete, statements which apparently seem contradictory are really due to gaps in the chemistry of these complex molecules. In Dr. Sharp's first paper on this subject, in which he deals with the products of digestion in neutral solutions, he points out that Wurtz, Poehl, Clayton, and Green have all regarded peptones as one of the products of the digestive action of this ferment, whilst Dr. S. Martin and Mr. Davis are quoted as supporting his own work on the absence of peptones under the conditions which obtain in laboratory experiments. It must not be forgotten, however, that Dr. Martin's experiments, which were conducted in 1886, were carried out with a material which cannot be compared with the purified products which subsequent investigators have examined, and that both Dr. Martin and Mr. Davis have proved that papain digests beyond what may be called the peptone stage, inasmuch as they have both found less complex nitrogen compounds, such as tyrosine and leucine, in the products of papain digestion. Dr. Sharp has also omitted to quote an authority like Dr. Halliburton, who says in his book, "Papain, like pancreatic juice, acting on animal proteids, converts them in an alkaline medium into proteoses, and finally peptone; acting on vegetable proteids it stops short at the proteoses, no true peptone being formed." Mr. Helbing and Dr. Passmore, in their "Pharmacological Record," July, 1893, have also found peptones in the papain digestion of both meat fibrin and egg albumin, by Wenz's method of saturation with ammonium sulphate to remove the other soluble proteids present. The conflicting nature of these statements has therefore induced me to accede to a request to make a thorough investigation of the behaviour of a variety of papain, which for some years has been especially standardised in this country, as to its digestive action, and may therefore be regarded as a product of uniform activity. Mr. Davis, in his recent letter to the *Pharmaceutical Journal*, suggests a very probable explanation of these diversities of opinion as due to the varying results obtained from papain derived from different sources, and his promised contribution on the value of papain of known botanical origin will no doubt throw a considerable amount of light on the discussion. The effect of concentration of solution has also at present been little studied, and it may in part account for the differing results obtained by different workers. Thus, for example, Dr. Sharp has used far weaker solutions than those used by Mr. Helbing and Dr. Passmore, although it is well known and is specially pointed out by Dr. Finkler that papain digests more rapidly in concentrated solutions as they exist in the human stomach, or in other words, when a large amount of undigested proteid is present. The activity of the papain is undoubtedly greater if the amount of water is less and the amount of proteid greater than when pepsin is the enzyme employed, so that parallel experiments conducted with pepsin and papain will give different results from these causes. One per cent of papain to the wet fibrin or egg albumin appears to be sufficient when the digestion takes place at the body temperature. The quantity of liquid present should not exceed three times the weight of the proteid used, and in neutral and in alkaline solutions one and a half the quantity suffices. Dr. Sharp, on the other hand, uses as much as ten per cent. of the enzyme, and allows the digestion to proceed in a solution of about 100 times the weight of proteid. To show that there is a considerable difference in the products formed when these conditions are varied, I have carried out two sets of experiments. In the first series 10 grammes of meat fibrin was digested for twenty hours in a closed bottle with 0·1 gramme papain and 30 C.c. of distilled water, 0·3 per cent. sodium bicarbonate solution, and 0·3 per cent. hydrochloric acid solution respectively. At the end of this time the whole of the fibrin had gone into solution, the amount dissolved being 99·64, 95·12, and 98·40 per cent. respectively, calculated on the dry weight of the fibrin.

The solutions were then dialysed through parchment paper and tested by the biuret reaction after some hours. There was no pink coloration obtained with the dialysed alkaline liquid, but the neutral solution gave a distinct pink reaction, while the acid liquid contained a large amount of biuret reacting substance. The second series of experiments were carried out under precisely the same conditions, but the quantities employed were in the proportion of 1 gramme of egg albumin to 0·1 gramme papain and 200 C.c. of solution. After dialysis for about sixteen hours there was only a faint pink coloration in the acid and neutral dialysed liquids. It is therefore evident that in a weak solution the digestion does not proceed to the full extent, and that neither peptone nor deutero-albumose is produced in any quantity. On the other hand, when the solution is concentrated, then the digestion is completed to a further stage, and proteids capable of dialysis, are formed. The absence of results with the alkaline solution is noteworthy, and I propose to further study the subject in this direction. That there is an obvious difference in the behaviour of papain when the amount of liquid is varied, and with different ratios of papain to undigested proteid was confirmed by a fresh series of experiments with both egg albumin and meat fibrin. Two experiments, A and F, were arranged for the digestion of egg albumin as follows:—A. 5 grammes egg albumin, 0·2 gramme papain, and 500 C.c. distilled water. F. 10 grammes albumin, 0·1 gramme papain, and 30 C.c. distilled water. Both these experiments were started at the same time, and digestion was allowed to proceed for seventeen hours at about 36° C. At the end of this period 50 C.c. were dialysed into 50 C.c. of water. At the end of two hours A gave no biuret reaction, whilst F, in less than ten minutes, gave the biuret reaction distinctly. The presence of a proteid which is capable of rapid dialysis, and giving the biuret reaction under the conditions of experiment F, is therefore established, whilst in experiment A, in which the conditions are more nearly those of Dr. Sharp's, there is no formation of peptone, or even of any deutero-albumose in any quantity. The remaining portion of the digested solution F was treated by Wenz's process, and after the removal of the ammonia by baryta, gave the biuret reaction. Similar experiments with meat fibrin confirm the above conclusions. Thus, while 5 grammes fibrin, 0·2 gramme papain, and 500 C.c. of distilled water digested for seventeen hours gave after dialysis for two hours only a very faint pink colour with copper sulphate and caustic soda, a mixture of 40 grammes fibrin, 0·4 gramme papain, and 120 C.c. water yielded a solution which on dialysis (25 C.c. into 20 C.c. water) for twenty minutes gave the biuret reaction most strongly. In this latter experiment the presence of peptone was further confirmed by the addition of nitric acid to some of the undialysed liquid, which gave a copious yellow precipitate, but none with the same solution after dialysis. Mr. Dott, in his note communicated to the last meeting of this Society, has made use of this test for distinguishing between peptone and other soluble proteids. Since deutero-albumose is also not precipitated by nitric acid, this test alone is not confirmatory of the presence of peptone, but must be accompanied by some other test, such as quick diffusibility through a membrane. In his experiments, although he has demonstrated that with the amount of dilute acid given, pepsin renders a greater amount of proteid insoluble in nitric acid than papain, he has not shown whether the pepsin has produced peptone, deutero-albumose, or a mixture of the two.

In a further series of experiments I have endeavoured to ascertain precisely the value of Wenz's process for separating small quantities of peptone from the allied proteids existing in the digested solution. For this purpose I digested 50 grammes of fibrin and egg albumin with 150 C.c. of water and 0·5 gramme papain for eighteen hours. The experiments were done in duplicate for purposes of control. After digestion, the filtrates, amounting to about 150 C.c. in each case, were divided into several portions. From 25 C.c. of each filtrate the total solids in solution were estimated and found to amount to 1·974 gramme in the case of the meat fibrin and 1·809 gramme in the case of the egg albumin, per 100 C.c. A second 25 C.c. of each was dialysed into 50 C.c. of water through parchment paper for thirty minutes, when the dialysed liquid in each case gave the biuret reaction most distinctly. The control experiments behaved similarly. The remaining 100 C.c. was treated with ammonium sulphate, evaporated, filtered, and the filtrate made up to the original volume. These solutions should not contain any other proteids than peptone. They gave, however, a red precipitate with Millon's reagent, a turbidity with bromine water, and a pink brown precipitate with Adamkiewicz's test. After removing the ammonium sulphate from a portion by means of baryta and the excess of barium salt with dilute sulphuric acid, the fibrin solution gave a faint pink biuret reaction, but none was noticed with the egg albumin. Another portion of each was boiled with carbonate of soda until the distillate showed no reaction with Nessler's solution. Alkaline permanganate was then added and the distillation continued, and the quantity of albuminoid ammonia present determined in the usual way. Calculating the quantity of ammonia so produced to peptone, allowing 17·1 per cent. of nitrogen for fibrin peptone and 16·5 per cent. of nitrogen for albumin peptone, I find the quantities of peptone per 100 C.c. of digested fluid to be:—

| | (1) | (2) |
|---|---|---|
| Meat fibrin...... | ..0·42 gramme......... | 0·387 gramme. |
| Egg albumin...... | 0·33 gramme......... | 0·394 gramme. |

It is of course possible that the organic nitrogen determined in this way is derived from any amido acids which may be formed during the digestion, and are not decomposed by boiling with carbonate of soda, but in that case it will be necessary to assume that deutero-albumose passes directly into the condition of amido acid without any intermediate peptone stage. In any case the presence of organic nitrogen in the solution after treatment with ammonium sulphate proves that the digestion by papain is continued further than the deutero-albumose stage. I am continuing these experiments by determinations of the total organic nitrogen in a digested solution before and after treatment with ammonium sulphate, using the Kjeldahl process, and hope in that way to further elucidate the problem. Kühne's paper in Zeit. Biol XXIX. 29, on the Wenz's process for separating albumoses from peptone, to which Dr. Sharp refers in his last paper, shows that this method of separation is open to some objections, and that therefore the identification of peptones in small quantities in presence of other proteids is a problem of some difficulty. I therefore prefer to rely on the quick diffusion of the proteid through a dialyser as a test for its presence, although a determination of the total nitrogen before and after treatment with ammonium sulphate ought to give useful information on the ratio of the albumoses to further products of digestion.

The Chairman said this paper was hardly a complete answer to Dr. Sharp, and it would appear that some further work remained to be done.

Mr. Dott said they were much indebted to Dr. Rideal for this paper, which had a considerable appearance of learning, and indicated that the author was well up to date in regard to the transformations taking place in the digestion of albumin. The real question to be determined, however, was, which of the two, pepsin or papain, was the best solvent for albumin. If they could get the albumin into solution the stomach would almost certainly be able to carry the process to the further stage of peptone. With regard to non-precipitation by nitric acid, whether or not that was an evidence of peptonisation, it was at least proof that hydration or digestion had gone beyond the stage of mere solution. With regard to concentration the B.P. prescribed about three parts liquid to one part albumin, and these were very nearly the proportions he (Mr. Dott) adopted in his experiments. With regard to the favourable results said to be obtained by certain experimentalists, it might be that a carefully prepared and specially pure sample of papain was supplied in these cases. He had experimented with ordinary commercial samples, and they were certainly nothing like pepsin in solvent or peptonising power.

Mr. Boa said it was alleged that certain brands of papain were standardised and uniform in quality and power. Such was not his experience. He found samples differing widely in solubility in water or glycerin. Sometimes a sample would dissolve easily. At another time one-half or one-fourth remained undissolved and floated about like a piece of yeast. The time taken in these experiments—sixteen to twenty hours—was also ridiculous. Pepsin would give peptone in two hours, and anything that took longer than four hours would be useless, because it would have passed out of the stomach before its work was nearly done. Nobody would dispute the solvent power of papain on proteids, but he would have been surprised if it had formed peptone. It was purely vegetable, and he did not think it reasonable to expect it to form peptone like pepsin, which was an animal product.

Mr. Coull said it looked very much as if papain had received its death-blow as a therapeutic agent. He also thought the time it took to act was far too long for practical purposes.

Mr. Rutherford Hill said Dr. Rideal's paper had carried them a good deal further on the road in this investigation, but it had not brought them to the end by any means. He agreed with Mr. Dott that it was by the examination of commercial samples that they must judge papain, and it would be an advantage to have a recognised test under definite conditions, as in the case of pepsin. With regard to Mr. Coull's remark, they had not quite got the length of giving a death-blow to papain. It had been shown that it possessed considerable solvent action on albuminoids, and it had proved a very effectual remedy in removing the false membrane in diphtheritic sore throat. As Mr. Dott had remarked, if the albumin was got into solution, though it was not converted into peptone, it must be a very weak stomach that could not complete the process. In these ways a good deal of service might be got out of papain. This research was of considerable general interest and importance in connection with the whole question of digestion, and Dr. Gordon Sharp had done valuable service in bringing it so prominently forward.

The next communication was on :—

## ASSAY OF OPIUM.

BY D. B. DOTT, F.I.C., F.R.S.E.

In previous notes[*] on this subject I have indicated what were considered some of the weak points of the pharmacopœia process, and showed that in point of accuracy the Teschemacher and Smith process is preferable. In a subsequent note[†] I described a modification of the last-mentioned method, which appeared to possess some advantages, and the accuracy of which I have since had occasional opportunity of proving. It has the defect of most of the other processes in not being very expeditious.

The operations required in the B.P. method do not occupy a very long time, but for the morphinate of lime to react completely with the ammonium chloride, and for the morphine to precipitate, requires some six or seven hours. There are several possible sources of error in the pharmacopœia process, most of which have been already discussed. The chief of these are, that the volume of liquid from which the morphine is precipitated is too large, and the amount of free ammonia liberated is too great. Yet these are defects inherent in the method, and cannot be remedied.

The following method has yielded me good results, and I think possesses some distinct advantages over any of those referred to. 10 grammes of powdered opium is digested with 25 C.c. water; 1·8 gramme barium chloride dissolved in about 12 C.c. water is then added, the solution made up to 50 C.c., well mixed, and after a short time filtered. 22 C.c. (representing 5 grammes opium) is mixed with dilute sulphuric acid in quantity just sufficient to precipitate the barium. About 1 C.c. is required, and the solution should be warmed to cause the precipitate to subside and the solution to filter clear. To this filtered solution a little dilute ammonia, about 0·5 C.c., should be added to neutralise the free acid, and the solution concentrated to 6 or 7 C.c., and allowed to cool. 1 C.c. spirit and 1 C.c. ether are then added, and next ammonia in slight excess. The ammonia should be added gradually until there is no further precipitation, and a perceptible odour of ammonia remains after well stirring and breaking down any lumps with the stirring rod. After three hours the precipitate is collected on counterpoised filters and washed. Before filtering, it should be noted that the solution has a faint odour of ammonia: if not, one or two drops of ammonia solution should be added. The dried precipitate is washed with benzene or chloroform, dried and weighed. It is then titrated with *n*/10 acid, until the morphine is neutralised, as indicated by the solution reddening litmus paper. 1 C.c. *n*/10 acid

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[*] *Pharm. Journ.*, [3], xix. 82.

[†] *Pharm. Journ.*, [3], xxii. 746.

=·0308 gramme morphine hydrate. That is on the usual acceptation that the hydrate is $C_{17}H_{19}NO_3.H_2O$, although, as I have shown,* there is good reason to believe that it has the composition $8C_{17}H_{19}NO_3.9H_2O$.

The precipitate given by the barium chloride is much less bulky than that given by the B.P. process with its large quantity of lime, so that it is not difficult to allow for its volume with practical accuracy. The barium chloride not only precipitates the meconic acid, but also a large proportion of resinoid and impurities which interfere with the precipitation of morphine. The barium is entirely got rid of by the sulphuric acid, so that there is no risk of carbonate or basic salt of barium being present in the morphine precipitate, and so causing error in the volumetric estimation. The ammonia added is just the proper amount required to neutralise free acid, and to precipitate the morphine from its hydrochloride. It is a great advantage that it is not necessary to give a longer time than three hours for the morphine to precipitate. No notice need be taken of a very slight precipitate which forms after the morphine has been filtered off, as the precipitate does not consist of morphine, but for the most part of calcium meconate. On comparing this method with that above referred to (which we might call "the proof spirit process") I obtained 1·35 gramme of morphine hydrate, in both cases, from 10 grammes of opium =13·5 per cent. In another opium, assayed twice by the barium chloride process, I obtained precipitates (after washing with chloroform) $a=0·59$; $b=0·59$. These neutralised of $n/10$ sulphuric acid, 16·9 C.c. and 17 C.c., indicating ·51 gramme and ·515 gramme morphine, *i.e.*, the opium was=10·2 per cent. morphine. I do not mean to say that the results always come out so closely, but the same may truly be said of the best processes for opium assay. It would save time in the analysis if, instead of drying the precipitate and washing with benzene, the liquid containing the precipitate were washed with ether by decantation, and the washed morphine precipitate titrated directly with the standard acid. But the method by drying the precipitate before washing with benzene is to be preferred.

The next communication was a :—

## NOTE ON A VISCOSIMETER.

### BY D. B. DOTT, F.I.C., F.R.S.E.

Viscosimetry is not a subject of much pharmaceutical interest, it being chiefly applied to the examination of oils for their lubricating power. But it is also used as a test for the purity of oils, and might in some instances be introduced into the pharmacopœia for that purpose. Vicosity varies greatly (in most liquids) with temperature, and determinations at different temperatures are often of much value, as the amount of variation is different in different liquids. Putting aside elaborate and expensive instruments, the usual method is to allow a measured volume of the liquid to flow from a burette, the time required being noted. An identical experiment is made with another liquid, as standard, usually rape-seed oil. This plan answers fairly well. The results vary sensibly according to the dimensions of the orifice of the burette, but are practically constant for small calibres. The diameter of the opening should not be more than a millimetre. There is an obvious objection to the employment of rape-seed oil as a standard, as there may be uncertainty as to its genuineness or constancy of physical properties. It occurred to me that, given a vessel having two openings of unequal calibre, the relative rates of flow of the liquid from the two openings would vary with the viscosity, and that consequently a viscosimeter might be constructed on that principle, and that the results would be less likely to be affected by the density of the liquid than in the usual method of determination. Such an instrument may be made from a Y-tube, in which one orifice is more contracted than the other, or by passing two small tubes (with similar contractions) through a cork in an inverted wide-mouth bottle, in the bottom of which an opening has been made. It seems evident that the instrument might be standardised by fixing the amount of water that should flow from each tube in a definite time. In this arrangement the time is, of course, disregarded, the volumes of liquid being measured, and the smaller number divided by the greater. In this way a co-efficient is obtained which bears some relation to the viscosity, but the differences among liquids are not nearly so great as those indicated by the ordinary method. The following are some of the results obtained :—

| | | | | | |
|---|---|---|---|---|---|
| Water ... | 114 C.c. | and | 74 C.c. | indicating viscosity | 64 |
| Sperm oil | 114 C.c. | „ | 89 C.c. | „ „ | 78 |
| Rape-seed oil ... | 93 C.c. | „ | 78 C.c. | „ „ | 83 |

These numbers are quite different in degree from those obtained by the ordinary method. Indeed, this note is the merest suggestion. I do not profess to have worked the thing out at all. If a satisfactory viscosimeter could be constructed on these lines, one possible source of error in the usual method would be eliminated, viz.: the varying adhesion of different liquids for the material of which the viscosimeter is composed.

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Mr. Nesbit said he had found the bulkiness of the precipitate in the lime process of opium assay a difficulty, and Mr. Dott's method would obviate that.

Mr. Coull said he would like to ask if there was any allowance for loss in Mr. Dott's method. It was certainly an expeditious process, and if it worked well would be ahead even of that of the United States Pharmacopœia.

Mr. Rutherford Hill said one chief advantage in the suggested opium assay process was the saving of time. In connection with this subject he had often wondered if it would not be possible to devise a method of assay in which a process of washing out the alkaloid, as in the cases of nux vomica and cinchona, could be employed. This had been suggested to him by observing how easily the alkaloid could be removed from an alkaline solution of opium by shaking it up with amylic alcohol, especially if the liquid was previously warmed. He would suggest this method to those whose experience of opium assaying was more extensive than his, as a possible way of having an assay process still shorter than this of Mr. Dott's, and one which would be free from many of the difficulties and objections pertaining to all previously suggested plans. It might be that a determination of the total alkaloids would suffice, unless the variation in the relative proportions of the various alkaloids rendered such a process not feasible. The suggested viscosimeter seemed a good idea well worthy of further working out. It occurred to him that it might furnish a purity test for oils; any particular oil, such as olive oil, if of good quality, ought to give always the same figure with the same instrument. In that way it would be a method of confirming the purity or otherwise of the oil, apart altogether from the question of viscosity.

Mr. Dott, in reply, said undoubtedly there was some loss of morphine in his process, as in all other processes involving precipitation, and all that could be done to avoid such loss was to reduce the liquid to as small a bulk as possible. The error from this source was not, however, so great as might be supposed. For one thing, the morphine was not absolutely pure, and in neutralising it a slight excess of acid was generally used, because the litmus did not show reaction till a little free acid was present. These things compensated for any small loss of alkaloid. Mr. Hill's suggestion as to amylic alcohol was worthy of examination. At the same time he did not think it would be any more expeditious. Amylic alcohol dissolved all the opium alkaloids, and it would be necessary to have a further separation of the morphine. Amylic alcohol did not separate the alkaloids so readily as might be supposed, and he thought such a method would be as troublesome and take as long a time as the one he suggested.

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* *Pharm. Journ.*, [3], xviii. 701.

(*To be continued.*)

## MAJOR EXAMINATION QUESTIONS.

### CHEMISTRY.

*March* 30.—*Hours from* 10 *a.m. to* 1 *p.m.*

1. By what process may valerianic acid be obtained synthetically?

2. Point out the relationship between malic, succinic, and tartaric acids.

3. How do ethene dichloride, ethidene dichloride, and dichlorethane differ from one another?

4. How would you prepare acetamide? Contrast and compare the terms "amine" and "amide."

5. What is the constitution of thiophenol? How may it be obtained?

6. A compound has this percentage composition:—

C 15·3
H 3·2
I 81·4

How would you determine its molecular formula? State how you would prove that the formula you have obtained is the correct one.

### PHYSICS.

*March* 30.—*Hours from* 2 *to* 5 *p.m.*

1. State the law of simple refraction, and show how it is connected with the speed of light in each of the two media.

2. What is meant by thermo-electricity? How would you experimentally prove your statements?

3. If an incandescent body gives a luminous spectrum, with dark lines, what inference can be drawn as to its constitution?

4. What are the precautions necessary in the accurate determination of the boiling point of a liquid, *e.g.*, acetic acid?

5. Define the potential of an electric conductor, and describe in general terms one process for measuring the same.

6. Give a detailed explanation of the relationship between the specific heat of a body and its atomic weight.

### BOTANY.

*March* 31.—*Hours from* 10 *a.m. to* 1 *p.m.*

1. Give an account of the twining of tendrils, and of the various organs metamorphosed into these; and state how they differ in their mode of growth from climbing plants.

2. What is the typical form of fruit in Rosaceæ? Give the more important deviations, and specify in each case how the structural change is brought about.

3. Describe fully assimilation and metastasis, and define generally micrococcus, bacterium, bacillus, vibrio, and spirillum.

4. Describe the development and formation of cork.

5. Give a detailed description of the plant submitted, and refer it to its natural class and order.

### MATERIA MEDICA.

*March* 31.—*Hours from* 2 *to* 5 *p.m.*

1. Describe the source of Copaiba, and discuss fully its chemical and physical characters. What are its common adulterants? Give methods for their detection.

2. Define a Stearopten; name the pharmacopœial examples; describe their constitution, and how they may be prepared.

3. Name the official plants of the natural order Euphorbiaceæ; state the medicinal products yielded by plants of this order, and the means employed to obtain them.

4. What is meant by the term Balsam? Explain the constitution of a true balsam, and give instances of such.

5. What is Veratrine? From what is it obtained? Describe the official process step by step, and give tests to ascertain the purity of the product.

## EXAMINATIONS IN LONDON.

*April*, 1894.

Present:—Mr. Carteighe, President; Mr. Cross, Vice-President; Messrs. Corder, Druce, Fletcher, Gerrard, Greenish, Holmes, Ransom, Saul, Symons, Tanner, Taylor, and White.

### MAJOR EXAMINATION.

*Thirty-two* candidates were examined. *Fifteen* failed. The undermentioned *seventeen* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

| | |
|---|---|
| Bowker, John Taylor | Farnworth. |
| Casewell, Richd. Hazledine | Ludlow. |
| Donington, Robert Spencer | London. |
| Fox, Matthew Henry | Northwich. |
| Grindley, Thomas Foulkes | Mold. |
| Guyer, Richard Glode | Torquay. |
| Hare, James Archer | Hexham. |
| Horner, Robert | Budleigh Salterton. |
| James, George Christopher | Yardley. |
| Jones, John Monk | Aspull. |
| Kellett, William Herbert | Bolton. |
| Lewis, David | Llanrhystyd. |
| Lewis, Samuel Judd | London. |
| Robinson, James Frederick | London. |
| Smith, Edwd. Chas. Henson | Hull. |
| Smith, Ernest Alfred Austin | Bristol. |
| Watkins, Henry Baskerville | Darlington. |

## Scottish Transactions.

### EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

A meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, on Thursday, March 29, at 11 a.m., Mr. G. H. Laird in the chair.

The minutes of last meeting having been read and approved, Mr. Duncan McGlashan was nominated for election as a member at next meeting. The following new members were elected:—Messrs. Burley, Leask, Garvie, Guthrie, McDougall, Cormack, Jas. McGlashan, Bruce, Tocher, Brindle, and Mathieson.

It was suggested that a picnic should be arranged for the members of the Association, and it was remitted to the Committee to make arrangements.

Mr. C. F. Henry, Secretary, drew attention to a recent discussion by the Glasgow Association on the liability to stamp duty of labels in which the possessive case was used. He suggested that the Association should communicate with the Glasgow Association on the subject, and see if something could not be done. He believed that if the authorities were suitably approached on the subject they would make some further concession. They had already gone so far as to say that while holding that a label for Gregory's mixture or stomachic powder was liable to duty, they would not prosecute in such a case. He thought the authorities might be asked to extend this arrangement to all labels, such as Easton's syrup and Gregory's pills, where no proprietary right was claimed, and he had reason to believe that the request would be acceded to if it was put before the Inland Revenue Board in a reasonable manner. The Association had already approached Lord Wolmer, M.P., and had also requested the Council of the Pharmaceutical Society to represent the trade in an interview with Somerset House authorities. As they were aware, the Council had declined to represent them, on the ground that no good would result therefrom. He thought it was a pity they had not done so, as the Society was the only organised body at present that could represent the trade in such a matter. Probably when the federation of local associations was accomplished, they would be able to present a joint memorial. In the meantime he begged to propose "That this Association communicate with the Glasgow Association, with a view to joint action being taken in this matter."

Mr. George Innes seconded the motion.

Mr. Robert Aitken said he understood this question of liability of these labels had already been settled by the Board of Inland Revenue in a correspondence with Messrs. Macfarlan and Co.

Mr. Noble said that was so. The Board had indicated a way out of the difficulty, and he thought it was the duty of chemists to walk in the way which had been pointed out.

Mr. Maclaren was also of opinion that they should leave the matter alone, as the continual agitation had the effect of causing them to have more visits from the authorities. There was no use doing anything unless they were to propose to do away with the Act altogether.

Mr. Aitken further remarked that the Board was bound to interpret the Act as they found it. All that chemists needed to do was to provide themselves with a copy of Alpe's 'Medicine Stamp Acts,' and be guided by it.

Mr. Smith said that would only make confusion worse confounded.

Mr. Henry, in reply, said the communication with Glasgow would at least do no harm, and his motion was then agreed to.

Messrs. J. Bowman and J. A. Forret were appointed Auditors.

# Parliamentary and Law Proceedings.

## RECENT POISONING CASES.

### SUICIDE BY CARBOLIC ACID POISONING.

Mr. T. E. Sampson, the Liverpool city coroner, on March 29 held an inquest on the body of a dock labourer named John James Johnson, aged 63, of 38, Stern Street, who committed suicide by taking carbolic acid on Tuesday afternoon. The evidence given was to the effect that deceased had been strange in his manner for some time, and suffered from depression owing to being out of work. A verdict of suicide whilst temporarily insane was returned.—*Liverpool Post.*

### SUICIDE BY OXALIC ACID POISONING.

At the Portsmouth Town Hall, on Monday, March 19, the Borough Coroner (Mr. T. A. Bramsdon) resumed and concluded the inquiry concerning the death of Thomas Reay, gunner in the Royal Artillery, who died on March 8.

Dr. G. F. Morley, who was called in, said that he found the man lying dead on the bed. Mrs. Reay was kneeling in a state of collapse on the floor, supported by another witness. She was vomiting, and complained of great pain in the stomach. He saw the tumblers produced, and formed the opinion that she was suffering from oxalic acid poisoning, and treated her accordingly. Mrs. Reay said that she thought she had taken oxalic acid, and also said that as her husband was dead, she wanted to die too. She further stated that the poison, she thought, had been bought at a chemist's in High Street. It was bought in a paper, but they had thrown the paper into the fire. A *post mortem* examination showed that the deceased had died from the effects of oxalic acid poisoning.

Constable Moore said he had made inquiries of the chemists in High Street, but could not find that any drug had been purchased by the deceased.

George William Wassall, Mess Sergeant at Fort Grange, deposed that a very weak solution of oxalic acid was kept in the mess-room for the purpose of cleaning accoutrements.

The jury returned a verdict to the effect that deceased committed suicide by taking oxalic acid, but that there was not sufficient evidence to show the state of his mind at the time, and that deceased and his wife did not mutually agree to commit suicide.—*Hampshire Telegraph.*

### SUICIDE BY NARCOTIC POISONING.

An inquest was held at Finsbury, on March 28, respecting the death of Otto Welding, a grain broker, from Charlottenhund, Copenhagen, who had been in England since February last, and intended taking a business on the London market. He had been at Armfield's Hotel, Finsbury, about a fortnight, and on Sunday morning, as he could not be roused, his door was forced, and he was discovered lying dead on the floor. In a purse were found two small white powders.

Dr. Brown stated that death was due to some narcotic poisoning, though what witness could not say. Deceased might have taken sulphonal and then morphine. There was an empty glass by the deceased's right hand.

Mr. Thomas Dencoym, Danish Consul, then read a letter, in which deceased said he was now placed in such a position that he could not longer live, as he had no prospects of supporting himself. In another letter he apologised for the trouble the intending suicide would give. A verdict of suicide whilst of unsound mind was returned.—*Morning Leader.*

### DEATH FROM AN OVERDOSE OF CHLORODYNE.

An inquiry was held last week into the death of Lydia Windle, aged 53, the wife of a cattle drover, living at 3, West Richmond Street, Cross Lane, Salford. The deceased had been subject to bronchitis, and had been in the habit of taking chlorodyne in water. Lately she had suffered from pains in the legs. On Monday afternoon last the deceased was taken very ill, and by order of a doctor, who was called, she was removed to the Salford Royal Hospital, and there found to be suffering from opium poisoning. She became worse, and died the same night.

Dr. Stanley M. Brown, the house surgeon, who attended the deceased, had no doubt the woman had died from the effects of opium poisoning. At noon, on Monday, the deceased sent a boy for sixpennyworth of chlorodyne, which he procured. The husband was of opinion that his wife took an overdose of the chlorodyne to alleviate the pain in her leg. A verdict of death by misadventure was returned.—*Manchester Courier.*

### SUICIDE BY LAUDANUM POISONING.

An inquest was held at Newcastle, on April 2, on the bodies of Stephen and Jane Moore, aged 20 and 19 respectively, who died as the result of poisoning by laudanum. After hearing the evidence, the jury returned a verdict to the effect that both had died from the effects of laudanum poisoning. The husband, in their opinion, had taken the opium in a fit of despondency; but, whether his wife took the poison herself, or whether it was administered to her by her husband, there was not sufficient evidence to show.—*Newcastle Daily Chronicle.*

### ACCIDENTAL POISONING BY STRYCHNINE.

An inquest was held on April 2, at the Reform Inn, Pilton, by Mr. Bencraft, on the body of a little boy aged three years, son of Robert Pardie, of Raleigh, gamekeeper. Deceased was found lying on the bed, rigid and in pain, and on the floor there was a small bottle in which the father kept a little strychnine for killing vermin. A medical man was sent for, but the deceased died ten minutes afterwards. The jury returned a verdict of "Death through misadventure."—*Devon and Exeter Gazette.*

### SUICIDE BY MORPHINE POISONING.

At the Marylebone Coroner's Court, on April 2, Dr. G. Danford Thomas held an inquiry concerning the death of George Benford, aged 35 years, who committed suicide by taking morphine. The jury returned a verdict of "Suicide during temporary insanity."—*Morning Advertiser.*

### OVERDOSE OF LAUDANUM.

An inquest was held at Goole, on April 2, on the body of William Graves Blyth, chemist and druggist, Aire Street, Goole, who had taken an overdose of laudanum upon an empty stomach. A verdict of "Death through misadventure through an overdose of laudanum, aggravated by excessive alcoholic drinking," was returned.—*Leeds Mercury.*

### LAUDANUM MISTAKEN FOR COUGH MIXTURE.

Mr. Coroner Parker held an inquest at the Woolpack Inn, Cranford, on Tuesday, March 27, on the body of James Phillips, aged 74, who met with his death through being given laudanum in mistake for cough mixture by his daughter. She got what she thought was the medicine off a shelf, and poured some of the stuff out of the bottle into a glass, and gave it to him. She noticed a smell as of laudanum, and, on looking at the bottle, found it had contained laudanum. Subsequently, she gave deceased some warm water and some castor oil, and tried very soon after to keep deceased awake, but he died.

Dr. Price, of Kettering, said he had known deceased, who was in very feeble health, for years, and he certified that death was due to laudanum poisoning. The jury returned a verdict of "Accidental poisoning."—*Kettering Guardian.*

## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

### SPIRIT OF NITRE CASE.

At the Aylsham Petty Sessions, on April 3, before Mr. C. L. Buxton and other magistrates, Major Maude,[*] of Aylsham, druggist, was summoned under the Food and Drugs Act, 1875, for selling to Inspector Chambers, on February 27 last, spirit of nitre not of the nature, substance, and quality of the article demanded, and to the prejudice of the purchaser. Mr. Louis Tillett, of Norwich, appeared for the defence. After the case for the prosecution closed, Mr. Tillett intimated that he should, for the purpose of convenience, divide his defence into two branches, the one dealing with technical points of law arising on the purchase and analysis; the other being a total denial that the drug in question was adulterated, and not of the nature, substance, and quality of the article demanded. Mr. Tillett stated that he was confident that the defence on the merits must succeed, but with a view of saving the time of the Bench he would take the technical objections first, and added that if the Bench decided in his favour on any one of the technical points raised, the case for the prosecution must fail. The Bench concurring in this procedure, Mr. Tillett then addressed them at considerable length on the points of law. At the conclusion of his address the Bench retired to consider their decision. On their return, the chairman stated that the Bench agreed that one of the technical defences urged was fatal, and the summons would therefore be dismissed. Mr. Tillett asked for costs, pointing out that the real prosecutors were the County Council, who could well afford to pay, but the Bench, after again retiring, declined to grant costs.—*Eastern Daily Press.*

## Obituary.

### JOHN CARTEIGHE.

The subject of this notice, who died on Sunday last, in his seventieth year, was originally intended for the legal profession, but, becoming interested in scientific work, he left the solicitor's office, and, through the influence of a friend, a member of the Royal Institution of Great Britain, obtained the position of assistant to Michael Faraday. Here he found opportunities of increasing his scientific knowledge and training, and about the year 1846, while thus engaged, the late Mr. Charles Dinneford offered him a post in the pharmacy in Bond Street, where his chemical knowledge could be made use of. In the course of two or three years he was not only able to do all the chemical work required, but in consequence of his scientific training, speedily acquired all the skill and deftness of the average pharmacist. He was wont to say that a knowledge of chemistry and physics, together with botany, before apprenticeship, would materially facilitate the teaching of apprentices.

A few years after John Carteighe's first appearance in the Bond Street Pharmacy, Mr. Charles Dinneford died, and John Carteighe and his friend and comrade, John Edward Stuart (who, despite being his senior in years, is still hale and hearty), made arrangements for entering into partnership, and purchased the business since carried on under the style of Dinneford and Co.

At the end of 1863, Michael Carteighe, the brother of John, was admitted into the firm, and from that time the latter gradually retired from active management. This he was induced to do partly on account of his state of health, and partly because of his retiring disposition. From time to time he had complained of heart mischief, but until a fortnight before his death he had had no warning serious enough to induce him to take medical advice. When advice was taken, his condition was found to be serious, and he gradually grew weaker, and died peacefully in his armchair, at his residence, on April 1.

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[*] This name does not appear on the Register of Chemists and Druggists for 1894.

John Carteighe took little part in public or private meetings, except in his early days, when he attended the meetings of the Chemical Society in the old rooms at Somerset House, and where he made the acquaintance of such men as J. Lloyd Bullock and Stephen Darby. His disposition was so retiring that he even avoided all ordinary social functions, preferring to spend his time either in his library or in a little private laboratory at the top of his house. By the few who knew him he will be remembered as one of the most lovable and unselfish of men, and one who was incapable of thinking aught that was not noble.

He had been a member of the Society since 1853.

## Correspondence.

*** No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith. Matter intended for publication should be written on one side of the paper only. Names of plants should be underlined, and capitals used for generic names only.*

### THE COMPLETION OF CHEMISTRY.

Sir,—I am aware that Professor Crookes has proposed the term "protyle" for that single, universal, simple substance out of which he theorises the genesis of the elements. But as it is a foregone conclusion already amongst most philosophic chemists that in some way this simple substance being diluted in space into different densities makes the elements, and that the mono-, di-, tri- and tetravalency of the elements depend upon the shapes of the atoms of which, though all rounded and of similar size, some have one, two, three, and four flattened portions of their surfaces, whereby they can combine or cohere with each other in obeying the law of simple gravitation, whilst floating in the more or less agitated luminiferous ether, has any chemist carried it into his text-book or his teaching? Or what is it that hinders the copestone of science from being put on?

*Belvidere Hospital, Glasgow.* J. J. BROWN.

### MAGISTRATES AND CHEMISTS.

Sir,—Concerning the case of poisoning at Norwood reported in the *Pharm. Journ.* of March 17, Mr. Lines should possess his soul in patience, as Dr. Hetley only included him in the same condemnation as the Commons, Lords Spiritual and Temporal, and the Crown, for having blundered in an Act of Parliament. Let him try and realise what would have happened had the original Justice Shallow been on the Bench, instead of his representative after four centuries of evolution.

*202, Caledonian Road, N.* E. WARRELL.

## Answers to Correspondents.

*Inquirer.*—The juice is obtained in small quantity from the root, stem, and leaves, but the unripe fruit yields the largest proportion, and the younger the fruit the more abundant is said to be the supply. See the paper by E. J. Eastes (*Pharm. Journ.*, July 11, 1885) for full particulars. You might probably obtain the seeds you require from the director of the Royal Gardens, Kew, if you explained the purpose for which you wanted them.

## Diary of the Week.

MONDAY, APRIL 9.

*Society of Arts*, at 8 p.m.
"Photometry" (second Cantor lecture), by Captain W. de W. Abney.
*Galen Lodge of Freemasons*, at 4.30 p.m.
Installation Meeting at Freemasons' Hall.

TUESDAY, APRIL 10.

*Royal Institution*, at 3 p.m.
"Electric Illumination" (second lecture), by Professor J. A. Fleming.
*Photographic Society of Great Britain.*
"Polarisation practically applied to Photography," by B. Acres.
*Sheffield Microscopical Society*, at 8 p.m.
"A few remarks on the Microscopical Structure of Steel," by G. S. Packer.

WEDNESDAY, APRIL 11.

*Pharmaceutical Society of Great Britain.*
Library, Museum, School and House Committee.
*Sheffield Pharmaceutical and Chemical Society*, at 8.30 p.m.
Paper by G. A. Grierson.
*Society of Arts*, at 8 p.m.
"London Coal Gas and its Enrichment," by Professor Vivian Lewes.

THURSDAY, APRIL 12.

*Royal Institution*, at 3 p.m.
"The Etching Revival" (second lecture), by F. Seymour Haden.
*Chemists' Assistants' Association*, at 8.30 p.m.
"Recent Advance in Chemical Theory," by F. H. Carr.
*Liverpool Pharmaceutical Students' Society*, at 8.15 p.m.
Smoking Concert, at the Falcon Restaurant.

FRIDAY, APRIL 13.

*Royal Institution*, at 9 p.m.
"Some Properties of the Electric Discharge through Gases," by Professor J. J. Thompson.

SATURDAY, APRIL 14.

*Royal Institution*, at 3 p.m.
"Life among the Afghans" (second lecture), by J. A. Gray.

THURSDAY, APRIL 19.

*Chemical Society*, at 8 p.m.
"Action of Metals on Strong Acids," by G. J. Burch and J. W. Dodgson.
"Action of Light on Oxalic Acid," by Dr. A. Richardson.
"English Jute Fibre, II.," by A. Pears, junr.
"Natural Oxycelluloses," by C. Smith.

## Books, etc., received.

ROCZNIK FARMACEUTYCZNY, 1892. Part 2. Edited by ADAMA JAWOROWSKIEGO. Pp. 193 to 320. Warsaw, 1894. From the Editor.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX, for 1894. Pp. i.-lxiv., 1 to 672. 7*s.* 6*d.* Bristol: John Wright and Co. From the Publishers.

ÉTUDE MONOGRAPHIQUE DE LA FAMILLE DES GLOBULARIÉES. By Dr. E. HECKEL. (Illustrated). Paris: G. Masson. From the Author.

THE HEALTH RESORTS OF EUROPE. By THOMAS LINN, M.D. Second Edition. Pp. 1 to 332. 2*s.* 6*d.* London: Henry Kimpton and Hirschfeld Bros.

ANATOMISCHER ATLAS DER PHARMAKOGNOSIE UND NAHRUNGSMITTELKUNDE. By Drs. A. TSCHIRCH and O. OESTERLE. Part 3. 5 plates—Flores Tiliæ; Flores et Fruct. Sambuci; Caryophylli; Fruct. Anisi et Fœniculi; Herb. et Fruct. Cannabis Ind. 1*s.* 6*d.* London: Williams and Norgate. From the Publishers.

THE PHARMACOPŒIA OF THE EVELINA HOSPITAL FOR SICK CHILDREN, SOUTHWARK. Pp. 48. 1*s.* London: Published at the Hospital. From the Dispenser.

ODOROGRAPHIA: A NATURAL HISTORY OF RAW MATERIALS AND DRUGS USED IN THE PERFUME INDUSTRY. BY J. CH. SAWER, F.L.S. Second Series. Pp. 1 to 523. London: Gurney and Jackson. From the Publishers.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Braithwaite, Dunlop, Hill, Naylor, Parker, Sage.

## SUGAR OF MILK.

BY J. OLDHAM BRAITHWAITE.

*Pharmaceutical Chemist.*

The use of sugar of milk for dietetic articles, the greater part of which are employed either for infants' or invalids' food (mixed with water or milk, or both), renders it desirable that the official tests for the determination of its purity should be so framed as to exclude all samples unsuited for such purposes.

A recent examination of a milk sugar, stated to be unsuited for "infants' food," has shown that the characters and tests of the British Pharmacopœia, and even the more stringent requirements of the German and United States Pharmacopœias, are insufficient to ensure purity.

This sample of milk sugar, answering to the tests of the three pharmacopœias abovementioned, was found to coagulate fresh milk when heated with it to nearly boiling point. A number of samples having been obtained, and each one tested by boiling one gramme of the milk sugar with ten cubic centimetres of fresh milk, it was found that out of twelve samples four caused coagulation of the casein. A more complete examination showed that these four samples were further distinguished by the high percentage of ash which they yielded on incineration. In three instances this ash was almost entirely magnesia, and in the fourth contained calcium in addition.

This leaves but little doubt that in the case of these four samples, magnesia or the carbonate of magnesium had been added in the process of manufacture to neutralise the acidity of the whey during crystallisation, with the result that lactate of magnesium crystallised out with the milk sugar. Since many metallic salts, including those of magnesium, are known to coagulate milk, some neutral magnesium lactate was prepared. It was found that the addition of a very small amount of this salt to fresh milk caused the coagulation of the casein on boiling, and further, that when 5 per cent. of the salt was added to a sample of sugar of milk, which previously was without any action on boiling milk, immediate and complete coagulation resulted.

The following table shows the results of some comparative experiments, in which it will be noticed that those samples which cause coagulation of casein are those which yield an excessive ash. (It is probable that numbers 1, 8, and 12 were originally obtained from the same manufacturer).

| No. | 1 Gm. boiled with 10 C.c. fresh milk. | Amount of ash, per cent. | Composition of Ash, per cent. | Percentage of Lactate (Mg or Ca.) in Ash. | Acidity in Terms of Lactic Acid, per cent. |
|---|---|---|---|---|---|
| 1 | Coagulates. | 1·58 | 1·348 MgO. | 6·78 Mg. | 0·018 |
| 2 | Nil. | 0·21 | Mg. & Ca.* | — | 0·018 |
| 3 | Nil. | 0·32 | Fe, Mg, Ca.* | — | 0·072 |
| 4 | Nil. | 0·10 | Mg.* | — | 0·054 |
| 5 | Nil. | 0·09 | Mg.* | — | 0·086 |
| 6 | Nil. | 0·06 | Mg.* | — | 0·018 |
| 7 | Nil. | 0·03 | Mg.* | — | — |
| 8 | Coagulates. | 1·6 | 1·85 MgO. | 6·8 Mg. | — |
| 9 | Nil. | 0·08 | Mg.* | — | 0·072 |
| 10 | Coagulates. | 1·16 | 0·76 MgO.<br>0·22 $CaCO_3$. | 8·83 Mg.<br>0·47 Ca. | 0·036 |
| 11 | Nil. | 0·02 | Mg.* | — | — |
| 12 | Coagulates. | 1·48 | 1·86 MgO. | 6·9 Mg. | 0·018 |

* Traces only.

It seems desirable, therefore, that in the official tests for sugar of milk the amount of ash should be directed to be determined, and that this should not be allowed to exceed 0·25 per cent.

## NOTES ON MICROSCOPY.

**Softening Drugs for Cutting.** In studying the minute structure of drugs it is always advisable, in the first place, to cut sections of the dried material for examination, as in this way only can the whole of the cell contents be seen in their original situation as modified by the desiccating process. But for the purpose of a detailed study of the different tissue elements, it becomes necessary to soften the drugs so as to permit of their being cut in any direction desired. The method usually employed is simply to soak the roots, barks, etc., in water, or very dilute ammonia, glycerin, or spirit. A preliminary soaking in strong spirit (methylated) serves to remove excess of resin and so prevent spoiling the razor edge. The material may then be transferred to a mixture of equal parts of spirit, water, and glycerin, which exercises a joint softening and preservative influence. Water soaked drugs may also be preserved in this medium for any length of time, and if on removing any pieces they appear too soft, a proper consistence is readily restored by a longer or shorter immersion in strong spirit. Much more satisfactory results are obtained, however, by allowing the tissues to absorb water more slowly than is the case when immersed. A very good plan is to lay the drugs on an elevated metal frame standing in a soup plate containing water, and cover the whole with a glass bell-jar. Or they may be wrapped in moist blotting paper and similarly covered to prevent evaporation, whilst very small pieces may be efficiently softened by enclosing in a suitable small vessel with a piece of wet sponge. In this manner the tissues will approximate to their original condition with the least possible interference with the cell contents. Another method that has been suggested, which would probably be advantageous when time is limited, is to expose the drugs to warm aqueous vapour or condensed steam It would be desirable in this case to guard against an excessively high temperature, otherwise tumefaction of the starch grains present in the tissues might occur, as well as partial disintegration of the tissue elements.

**Sharpening Microtome Knives.** One of the main requisites in microtomy is to have a keen cutting edge on the razors or microtome knives, and some exceedingly practical and useful hints on this point are given in *The Microscope* for January, by Bausch and Lomb. They recommend that the hone be covered with soap and moistened freely with water, so that a lather will be formed and remain all the time the knife is being sharpened. The blade is directed to be first sharpened on the concave side until a fine thread appears on the cutting edge. It is drawn along the hone with the edge always forward and at right angles to the length of the stone. At the same time the blade is gradually drawn from base to point, so that the direction of the latter is indicated by a diagonal line. No pressure must be exerted on the stone by the hand. As soon as the thread appears on the edge, the knife is drawn in a similar manner equally to the right and left, so that both sides of the blade are ground and a uniform keenness is obtained. After cleaning with an old linen cloth, which is not permitted to touch the edge, the knife is lightly and carefully drawn across a leather strop, the back being now forward instead of the edge, and a slightly curved sweep rather than a straight diagonal being described by the blade. At the beginning of the sweep the edge of the blade should describe an angle rather less than a right angle, taking the length of the strop as the base, and the knife is again drawn towards the operator from base to point, as in the process of sharpening. It is suggested that the strop should be slightly covered with oxide of iron, and that the knife be wiped finally with a soft chamois skin, after which it is ready for use.

## WHY PHYSICIANS DISPENSE THEIR OWN MEDICINES.[*]

BY CHARLES S. SHAW, M.D.

I have something to say on this subject which may interest pharmacists, since it proceeds from a physician who believes that the medical profession is not without cause for complaint. I do not dispense my medicines, for reasons which are sufficient for me, which I will state presently; but I know the custom is growing among my medical friends, and I believe I am qualified to give the causes, by my personal experience, by my intimacy with those who pursue the practice, and by the discussions of the subject in the county medical society of which I am a member.

For twelve years I have been practising medicine in one of the large inland cities (of America), and in that time have formed a large acquaintance among pharmacists. Many of them are men of integrity, who would honour any profession; but the number of such leaves much to be desired. May their tribe increase!

Now, the most glaring and offensive evil that presents itself to a doctor on entering a drug store is probably the conspicuous display of patent medicines, with their accompanying advertising cards, almanacs, etc., that obtrude themselves from every side. The doctor knows, and the pharmacist should know, that the patent medicine business is an evil, but we can both recognise the fact that under present conditions it is more or less a necessary evil. There is a business as well as a professional side to pharmacy, and so long as the public demands these things, so long will they get them, and the drug store is the place where custom has decided they shall be sold. But having made this concession to expediency, why should the druggist exercise his best energies in furthering the sale and use of these things? Why should he endeavour with all his ability to make the office of physician superfluous to every imbecile who can read? It is not pleasant to have one's prescription for a rheumatic patient, for instance, come from the pharmacist wrapped in the advertisement of some sure cure for rheumatism, as has happened to me more than once. If the physician is to continue his cordial relations with the pharmacist, this patent medicine evil must be mitigated. It should not be forgotten that the physician is not the only sufferer, if a sufferer at all, from the use by the laity of patent medicines. The public is the victim, and usually the only one. Those who contract the vicious patent medicine habit are those who will most surely need the services of a physician; and where quackery is most rampant, legitimate medicine most does thrive.

The unwarranted refilling of prescriptions is another complaint the physician has to make against the pharmacist. Every doctor knows of scores of prescriptions that are handed from person to person and family to family, until whole neighbourhoods have been benefited or injured by their use. The loss of consultation fee by the doctor in such cases is not the supreme consideration, though it is sometimes urged with great vehemence. It is rather the damage to the patient from using what must often be an improper medicine, and the injury to the abused physician's reputation (which must often follow such mischief) that demand attention and remedy. The remedy is very simple, and with concerted action would not be difficult to attain. It is only to refuse to refill any prescription without an order from the writer.

Counter-prescribing is another item in the charges brought against the pharmacist. In the best stores this habit is not encouraged, but alas! the best stores are not too numerous. I do not allude to the mere sale of some advertised medicine in response to the customer's request for "something for a cough," or "for a headache." I believe this to be nearly legitimate. The form of counter-prescribing I protest against is that in which the druggist, or more usually his clerk, endeavours to find out just what is the matter with the patient, and what in his supreme knowledge is best suited to his complaint. As Dr. Fox says, it is in the field of venereal disease that this abuse most largely flourishes, and it has become a common story to the doctor's ears, from the lips of the chronic sufferer from a maltreated gonorrhœa or venereal sore, that he was first prescribed for by a drug clerk.

The habit of using inferior drugs, and also of substitution, is another count in the indictment. Here, again, the offenders are numerous, as the travelling salesmen of any wholesale house can readily testify. Only yesterday I prescribed codeine, to be made into pills of one grain each, for a patient whom I believed to be in urgent need of the medicine. To-day I find the druggist dispensed a lot of half-grain gelatin-coated pills, telling the messenger that two of them were equal to one of those I had prescribed. Evidently the pills had been long in stock, for they would have made good ammunition for duck-hunting, but they were beyond the solvent powers of my patient's exhausted stomach. This same druggist a few days ago dispensed a syrup of squills for me that was utterly spoiled—and he is one of the majority.

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[*] From the *Bulletin of Pharmacy*.

Carelessness in dispensing is another sin too often committed, though I bear willing testimony to its extreme rarity in good stores. A few weeks ago a thoughtless clerk transposed the labels on two of my prescriptions, so that my unlucky patient swallowed a teaspoonful of undiluted tincture of iodine, and douched her nostrils with ten drops of syrup of hypophosphites in a half-pint of warm water. At the same store a few days later the call for a refill of two-grain quinine pills was answered by a box of six boluses, each the size of a small walnut. My patient, this time an old lady with pneumonia, managed to swallow one of them by cutting it in eight pieces. Investigation showed that the clerk had given her a compound of male fern, santonin, areca nut, and some other things, that had been originally prescribed as worm medicine for a dog. This inexcusable carelessness occurred in a rather pretentious store, located on a prominent corner in our city, but a warning to the initiated exists in the conspicuous display of pyramids of patent medicines in the windows, and in the advertisement of "proprietary medicines at cut-rate prices" in the street cars. Is it any wonder some of us are driven to dispensing our own medicines?

This by no means exhausts my catalogue of grievances, but it is sufficient for my purpose; and now why, despite all, do I not dispense my own medicines? First, from lack of time. When I began practice I had more leisure than now, and I laid in quite a stock of drugs, with scales, mortars, and the other paraphernalia of a dispensary. For two or three years I rolled pills, spread plasters, and did the usual work of a dispenser. The labour was interesting rather than irksome, and I think the experience was beneficial. I can also endorse the statement of Dr. Fox that my patients much preferred to receive their medicines from my hands. But as the calls upon my time grew more frequent, and as I could not employ a clerk for the work, I was forced to give it up. I have not adopted the tablets employed by many physicians, as I am not skilled in their use, and I prescribe many things that cannot be prepared in condensed and portable form. Moreover, the stock I would have to carry would be larger than convenience would demand, and many times I would doubtless be tempted to prescribe rather what I had than what I believed would be best. If I practised in a neighbourhood where drug stores were few and far between, the interests of my patients might lead me to do otherwise; but as I am rarely more than fifteen minutes' distance from a drug store, and as my pencil and prescription pad give to me all the resources of pharmacy, I prefer to rely on the drug store. A final, and perhaps the best reason of all is that should the custom become universal, it would certainly work great injury. Pharmacy is an ancient, honourable, and useful profession, and notwithstanding the abuse of some doctors by some druggists, pharmacy has been of incalculable service to medicine, and will continue to serve and aid her. Fatally to wound the handmaid of medicine, because some of her votaries have and do misuse their opportunities, would be most unjust and most unwise.

## PHARMACOGRAPHIC METHODS.[*]

BY L. BRAEMER.

*Anatomical Method.*

(*Continued from page 775*).

The method of microscopical examination—at first applied to the study of food stuffs, starches, and certain minute structures, such as lycopodium—since being undertaken by Herlant in connection with pharmaceutical powders,[†] has been in recent years the subject of several special[‡] or general[§] works. Upon the whole, the anatomical study of crude drugs of vegetable origin may be regarded as having in great measure substituted fixed and constant characters for the variable and fleeting organoleptic ones. It throws light upon the botanical origin of a medicament; allows of a distinction being made between a given drug and any inactive or dangerous substance with similar external characteristics likely to cause it to be confounded with the former; and is also of value in differentiating varieties of drugs, whilst singularly facilitating the examination of substances in a pulverulent or powdered condition.

*Chemical Method.*

There yet remains an important point in the history of drugs, which has always attracted the attention of pharmacists, and upon which contemporary science has cast a vivid light. Their chemical composition and the isolation of their active principles is here alluded to. The analyses of Fourcroy, Vauquelin, Braconnot, and other French chemists of the beginning of the century, furnished but very imperfect data until Chevreul established the idea of the active principle (*principe immédiat*). The discovery of the alkaloids, preluded by Desrone in 1804, has led to the subject being revolutionised by the researches of Sertürner (1817), Pelletier and Caventou (1818–20), to cite only the first who entered this fertile territory.

One is inclined to believe, and there are also pharmacologists who share this opinion, that the active principles may ultimately replace in therapeutics the original substances, the crude drugs, from which they are extracted. The discovery of synthetic chemical medicaments supplies fresh arguments in favour of this idea. It is easy to perceive, however, that antipyrine, for example, cannot replace quinine, and many therapeutists prefer the leaf of digitalis to either amorphous or crystalline digitalin.

The determination of the amount of alkaloids present, which there have been so many endeavours during recent years to render rapid and practical, ought, according to pharmacologists, to replace the pharmacographic study of drugs. But a great number of drugs do not contain alkaloids, whilst those compounds, as already suggested, either do not always represent the full medicinal activity of the substances from which they are extracted, or are difficult to deal with. Though, therefore, the knowledge of the composition of a drug is one element of its history, it is only one. The isolation of the active principle, and the physiological and therapeutic study of its action, throw fresh light upon the history of a drug, and allow that to be studied from the point of view which is the last that now remains to be considered, that is according to the histo-chemical method.

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[*] From the *Bulletin de la Société de Pharmacie du Sud-ouest.*

[†] 'Contribution à la micrographie des poudres officinales.' Bruxelles, 1885.

[‡] Braemer, 'Caractères microscopiques des poudres officinales de feuilles.' Toulouse, 1892.

[§] Moeller, 'Pharmacognostischer Atlas.' Berlin, 1892. Collin, 'Guide pratique pour la détermination des poudres officinales.' Paris, 1893.

### *Histo-Chemical Method.*

The principles, chemically more or less definite, to which medicinal plants owe their activity and their employment in therapeutics, may be met with in all their organs and tissues. They present themselves under the most diverse aspects, and are localised in the most varied manner. They are found sometimes in special elements distinguished from the neighbouring ones by their anatomical and physiological characters. To these Sachs has applied the general term "idioblasts," the most highly differentiated being the "laticifers." Or, again, they may occur in actual secretory apparatus or reservoirs, such as the secretory canals and cavities. But frequently no morphological or functional modification affects the anatomical element in which the active substance is found. To consider only one and the same element even, the principles it contains may occur either as the result of a modification of the cellulose wall, as in the case of the gums and mucilages, or they may constitute part of the cell contents. These contents, in turn, may differ considerably. In some cases, as in starches and crystals, they assume definite forms. Others are more or less refractive liquids in small drops, as fixed and volatile oils. But in the great majority of instances the contents are amorphous, and may exist either as irregularly formed granules or dissolved in the cell-sap.

The attention of histologists studying plants from the physiological or pharmacographic point of view has naturally been directed in the first place to their principles or mixtures of these, in order that their proper forms or those of the tissue elements containing them might, so to say, be put in evidence.* But amorphous substances, whether solid or in solution, could not thus be identified when examined *in situ* under the microscope. The reactions termed micro- or histo-chemical ought to satisfy the most particular special conditions, as to delicacy, sensibility, and intensity. The precipitates or colorations to which they give rise ought to be clearly visible under the microscope, and be capable of being produced with very minute quantities of the bodies sought. Further, the tissues containing them ought not to be altered too quickly by the action of the reagent, which should not affect neighbouring bodies. All these conditions are not always easily secured, and these researches bristle with difficulties so great as to demand a certain skill in the operator and, more especially, chemical knowledge which is too often lacking in investigators.

Micro-chemical reactions were applied at first for physiological purposes, to distinguish substances which, like the carbohydrates, form the groundwork alike of the vegetable tissues and their derivatives—the sugars; or which, like the albuminoids, constitute the essential living portion of the anatomical elements. It will suffice, in this connection, to recall the excellent work of Sachs, published about 1860. For a long time also it has been customary to search by similar methods for such bodies as resins and tannins,* as ill-defined chemically as physiologically, but abundantly scattered throughout the vegetable kingdom.

The principles possessing therapeutic activity are not often met with in one plant only, but sometimes in all the species of the same genus (the alkaloids of cinchona, for example), and more rarely in all the members of one or more families, related or remote (caffeine, etc.)† By reason also of this peculiarity, their physiological *rôle* in vegetable life has been considered, perhaps wrongly, as secondary; and thus, regarded as waste products, their micro-chemical determination has been neglected until recent years.

However, from the time when histological research was first applied in the study of medicinal plants—according to the programme which was drawn up by Schleiden in 1844, when he demonstrated the results that might be obtained, in his monograph on the sarsaparillas—the position of active principles in the tissues has occupied the minds of pharmacologists. Already, in 1849, Weddell, one of the promoters of the anatomical method, had sought to localise the quinine in cinchona barks. The investigations on the same subject by Wigand‡ and C. Müller§ have only furnished contradictory data, and in spite of the results obtained by Howard,‖ it was sought to decide the matter by other means.¶

It was in 1873 that Borscow, of Kiew, attempted to characterise and localise a certain number of the principles to which medicinal plants owe their activity. His researches dealt with bodies possessing very diverse chemical functions—asarone, chrysophanic acid, frangulin, veratrine.** A short time afterwards, W. Pfeffer published his observations on hesperidin,†† and a little later still Herrmann defined the micro-chemical characters of berberine.‡‡ From this time works multiplied, and it is unnecessary to recall here more than the principal ones, that is to say, those which dealt with the active principles, properly so called, the alkaloids and glucosides.

Besides the works already cited, dealing with quinine, berberine, and veratrine, and those of Rossoll§§ upon strychnine, it is above all to Errera and his fellow workers that science owes precise data respecting micro-chemical research and the localisation of the alkaloids.* The histo-chemical study of the glucosides has been undertaken by Herrmann, already referred to; by Wothtschall,† whose work on solanine contains excellent observations on histochemical methods; by Rossoll,‡ the records of whose researches on glucosides and alkaloids have been collected in an interesting memoir; and by Molisch,§ who also has brought together his series of essays in a complete work.

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* Chatin, 'Du siège des substances actives dans les plantes médicinales.' Paris, 1876.

* Braemer, 'Les Tannoïdes.' Toulouse et Lyon, 1890-91.

† Schær, 'Verbreit. Chem. Verbind. in Pflanzenwelt.' Zurich, 1888.

‡ 'Ueb. d. Sitz China-Alkaloïde' (Bot. Zeitg., 1862).

§ 'Unters. üb Sitz d. Alkaloïde in Cinchonarinde' (Jahrb. f. wiss. Botanik., 1866).

‖ 'Quinology of East Indian plantations.' London, 1869.

¶ Carles, 'Étude sur les Quinquinas.' Paris, 1871.

** Borscow, 'Beitr. z. Histochemie d. Pflanzen' (Bot. Zeitg., 1874).

†† Pfeffer, 'Hesperidin' (Bot. Zeitg., 1874).

‡‡ Herrmann, 'Nachw. organ. Verbind. in veget. Gewebe.' Leipzig, 1886.

§§ 'Ub. Sitz...d. Strychnin' (Sitz. Ak. Wiss. Wien., 1884)

In the course of his work upon the glucosides of the Amydaleæ, Cruciferæ, and families which group themselves around those, Léon Guignard‖ has discovered the situation of the ferment which decomposes them. Finally, the author¶ has recently shown that the histo-chemical method serves not only to fix the position of active principles, but also to characterise the elements containing them, of which the nature has been hitherto unknown. To conclude, it remains only to cite examples proving the services that the histo-chemical method has rendered in the determination of crude drugs of vegetable origin.

(*To be concluded.*)

## CONSTITUENTS OF ROSE OIL (OTTO).**

According to Eckart the chief constituent of rose oil was represented to be an alcohol having the formula $C_{10}H_{18}O$, to which he gave the name of rhodinol.[1] Markownikoff and Reformatski considered the alcohol of rose oil—which they named roseol—to be $C_{10}H_{20}O$.[2] Barbier[3] has since confirmed the work of Eckart and (in conjunction with Monnet) stated that French geranium oil also contains a considerable amount of rhodinol mixed with other substances which disguise its nature.[4]

In a recent investigation of rose oil, Bertram and Gildemeister have been unable to isolate a substance having the characters attributed by Eckart to rhodinol, but they have ascertained that the fractions which should have contained rhodinol consisted essentially of geraniol, the smell and other characters of which were modified by the presence of a small proportion of substance leaving an odour of mint. They mention that the published data relating to the physical characters of the product obtained from rose oil and named rhodinol are discrepant, as shown below:—

| Authority. | Source. | Specific Gravity. | Boiling point. | Mm | Rotation. |
|---|---|---|---|---|---|
| Eckart. | German rose oil. | ·8837 at 15° C | 216°*<br>110°–120° | 12 | ÷2°·8 |
| | Turkish rose oil. | ·8804 15°<br>·8789 18°<br>·8813 12° | 216°*<br>217°*<br>112°–120° | 12 | ÷2°·7<br>÷2° 7 |
| Markownikoff and Reformatski. | Bulgarian rose oil. | ·87846–20° | 224° 7 | 750 | 3° 20′ |
| Barbier. | Turkish rose oil. | ·8956 0° | 126°·5 | 16 | 2° 37′ |
| Monnet and Barbier. | Turkish rose oil. | ·8896 0° | 124° | 14 | 2° 37′ |
| | French Geranium oil. | ·8886 0° | 124° | 14 | 2° 34 |

* These boiling points were determined by the Siwoloboff method, *Berichte*, 1886, p. 795.

Eckart states that rhodinol cannot be distilled unaltered except under reduced pressure. Markownikoff and Reformatski state that roseol can be distilled without change under ordinary pressure. Bertram and Gildemeister have therefore examined rose oil of both Turkish and German origin.

Bulgarian oil of 1893 was freed from stearopten by mixing with three times its volume of 70 per cent. alcohol, freezing and filtering. After distilling off the alcohol a pale yellow oil remained of ·8863 sp. gr. at 15° C. Optical rotation—2° 56′ for 100 Mm. By saponification with alcoholic potash the amount of acetic ether present was found to be only 6·3 per cent for an alcohol of the formula $C_{10}H_{18}O$.

On distilling the oil at 11 Mm. pressure it began to pass over at 100° C., and when the temperature had risen to 159° there remained a thick liquid having the smell of sesquiterpene.

By distilling under a pressure of 9 Mm. three fractions were obtained, the second and third being the largest:

1. At 101°–106°.
2. „ 105°–115°.
3. „ 115°–145°.

Under normal pressure the oil was separated into four fractions at the following temperatures, the second and third being largest, but no decomposition was observed:

1. 215°–228°.
2. 228°–230°.
3. 230°–233°.
4. 233°–240°.

The boiling point of the principal portion of the oil being that of geraniol, the presence of that alcohol was tested for by conversion into the calcium chloride compound described by Jacobsen.[5] The product so obtained boiled between 106°·8–107°·2 under 8 Mm., and under normal pressure between 229°–230° C. it had a sp. gr. ·8817 at 15°, and presented the other characters of geraniol. The amount of this constituent in Turkish rose oil was estimated at 90·4 per cent.

German rose oil examined in a similar manner proved to have the same composition. The geranyl acetate present amounted to 4·4 per cent. By distillation under 10 Mm. the oil almost all distilled over between 116°-140°, the first fraction amounting to 88 per cent. passing over between 110°-111°, and distilling under normal pressure without residue between 228°-232°. The difference observed in the case of Turkish oil may have been due to its distillation by open fire and partial resinification or change thus effected.

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* 'Prem. rech. sur la localisation des alcaloïdes.' Bruxelles, 1887. 'Distinct. microchim. des alcal. et des mat. protéiques.' Bruxelles, 1889.

† 'Ub. mikrochem. Reakt. des Solanins' (Zeit. f. wiss. mikrosk., 1888).

‡ 'Ub. mikroch. Nachw. d. Glycosid. Alkaloïde.' Stockerau, 1889.

§ 'Grundr. Histochemie d. pfl. Genussmittel.' Jéna, 1891.

‖ 'Sur la localisation des principes, etc.' (Journ. Botan., 1890, 1893, and Comp. rend., 1893).

¶ Braemer, 'Localisation des princ. actifs des Cucurbitacées.' Toulouse, 1893.

** Abstracted from a reprint of a paper by J. Bertram and E. Gildemeister in the *Journ. f. prakt. Chemie*, xl.

[1] *Arch. Pharm.*, 229, 355, *Pharm Journ.* [3], xxi., 664.

[2] *J. prakt. Chem.* (2), 48, 293.

[3] *Compt. rend.*, 117, 177.

[4] *Ibid.* 1092, and *Pharm. Journ.*, liii., 628.

[5] *Ann. Chem.*, 157, 234.

Geraniol being the chief constituent of Palmarosa oil (Indian geranium oil from *Andropogon schœnanthus*), the geraniol prepared from that oil was examined and found to correspond with the geraniol of rose oil. Similar results were obtained with geraniol prepared from African geranium oil, obtained in Algiers by distilling the leaves of various kinds of pelargonium with water. Schimmel has already shown that citronella oil contains geraniol, and it proves to be identical with that from other sources. The substance named licarhodol, and obtained from linalool by Barbier,[6] appears also to be identical with geraniol.

The following table gives a statement of the characters of geraniol obtained from various sources :—

| Source. | Boiling Point | mm | NormlPressure | Sp Gr |
|---|---|---|---|---|
| Palmarosa oil.. | 107°·4-108°·2 | 8 | 229°-230° | ·8834 |
| Pelargonium oil | 109° - 109°·5 | 9 | 228°·5-229°·5 | ·8801 |
| Turkish rose oil | 106°·8 - 107°·2 | 8 | 229°-230° | ·8817 |
| German rose oil | 107° - 107°·6 | 8 | 229°-230° | ·8829 |
| Citronella oil... | 106°·5 - 107° | 8 | 229°-230° | ·8826 |
| Linalool ......... | 110° - 111°·2 | 9 | 229°-230°·5 | ·8830 |

The most striking difference is in the specific gravity, which may be due to the ready oxidation of geraniol, and to partial formation of citral and other products by exposure to air.[9]

As to the chemical relations of the alcohol of rose oil and the geraniol from other sources, it appears from the nature of the products obtainable by the action of dehydrating agents that the composition of these bodies is represented by the formula $C_{10}H_{18}O$. Eckart showed that by treatment with phosphoric acid one molecule of water is abstracted from rhodinol, and that dipentene is formed.[10] Monnet and Barbier confirmed the formation of dipentene, but they obtained this terpene by passing hydrochloric gas into rhodinol.[11] Barbier had also obtained dipentene from the geraniol of palmarosa oil.[12] Bertram and Gildemeister have since obtained terpene by the action of formic acid upon geraniol, but terpinene is also formed, and this change points to the formula $C_{10}H_{18}O$. The production of citral from rhodinal by oxidation is also important. Eckart[13] obtained, by treatment with chromic acid, an aldehyde smelling like lemon, $C_{10}H_{16}O$, which he named rhodinal, and subsequently Tieman and Semmler[14] proved its identity with citral, showing that the formula of rhodinol must be $C_{10}H_{18}O$ instead of $C_{10}H_{20}O$, that adopted by Markownikoff and Reformatski, and citral had long before been obtained by Semmler from geraniol.[15] The acids produced by this oxidation, called by Eckart rhodinolic acid and by Semmler geranic acid, are also the same body. Potassium permanganate oxidises geraniol to isovalerianic acid,[16] and Eckart also obtained valerianic acid among the oxidation products of rhodinol.

It may, therefore, be regarded as proved that the products named rhodinol and roseol were only impure substances consisting essentially of geraniol, and that Barbier's licarhodol was the same thing.

It still remains to be ascertained what is the nature of the substance present in roseol in very small proportion, to which, together with the geraniol, the odour is due.

## GAMBIA NATIVE MEDICINES

Mr. J. H. Ozanne, Travelling Commissioner for the Gambia, West Coast of Africa, has sent a small collection of plants from the northern bank of the Gambia, accompanied by some brief notes on the medicinal uses of some of them. Though the plants and their uses are for the most part well known, it may be of some interest to record the identification of the native names with the species as determined at Kew.

The following are the principal plants referred to:—

*Anona senegalensis*, Pers. Called "Diorgud" by the natives. The leaf, heated and soaked in water, is used in diarrhœa and for griping pains in the stomach. The petals of the flowers are used on the Niger for flavouring country dishes.

*Cochlospermum tinctorium*, Rich. "Foosca" of the natives. A decoction of the roots is given to assist women in labour. The plant is well known in the Soudan for a yellow dye obtained from the roots.

*Sclerocarya*, sp. It has not been possible to determine the species of this plant. By the natives it is called "Dib." The gum is dissolved and mixed with soot and used for ink. The fruit resembles a greengage, and the juice is boiled down to a thick black consistence, and used by the natives for sweetening their "cherree," or Guinea corn gruel.

*Cassia sieberiana*, D.C. A small tree, called by the natives "Guamgua." The root is steeped in water, and the infusion used to promote the flow of urine.

*Combretum*, sp. This plant, called by the natives "Topp," has not been specifically determined. The gum is used for the cure of toothache, and a decoction of the root is given to relieve pains in the stomach.

*Sphæranthus hirtus*, Willd. This is a common weed, called by the natives "Lookidge." It is gathered and spread thickly on beds on which sick persons are laid, as it is said to relieve pains in the body and limbs and to induce sleep.

*Ocimum basilicum*, L. A very common weed, much used by the natives, who soak it in water and drink the infusion for "cooling the blood."—*Kew Bulletin.*

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[6] *Compt. rend.*, 116, 1200.
[7] *Ibid.* 1253.
[8] *Ibid.* 117, 1200.
[9] *J. prakt. Chem.* [2], 48, 299, 302.
[10] *Archiv. Pharm.*, 229, 382.
[11] *Compt. rend.*, 117, 1094.
[12] *Ibid.* 121.
[13] *Archiv. Pharm.*, 229, 372.
[14] *Berichte*, 26, 2714.
[15] *Ibid.* 24, 203.
[16] *Ibid.* 23, 1102.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, APRIL 14, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

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## OBSERVANCE OF THE PHARMACY ACT.

THE action taken by the Treasury department in regard to the sale of poisons has had the result of effectually demonstrating that the provisions of the Pharmacy Act are capable of being enforced with much greater stringency than had previously been supposed, and of showing that various trade practices assumed to be outside the scope and intention of the Act could not be continued without incurring liability to prescribed penalties. We have on several occasions pointed out this fact, and indicated that this altered condition would affect legally qualified chemists as well as traders who are not registered in that capacity. But the strange anomaly, that the application of the Act has been so long in abeyance with regard to irregular dealings in articles which are now held to be poisons within the meaning of the law, has had a mischievous influence in diverting attention from the necessity of strict compliance with its provisions in all instances. The circumstance of proprietary medicines being generally sold without the poison labels which are rendered necessary by their nature, and without any indication that the sale of them involves liability under the Pharmacy Act, has contributed largely to a kind of habitual disregard of legal requirements in ordinary practice much to be regretted from every point of view. The difficulties which chemists often have to encounter in endeavouring to carry out the provisions of the law, in consequence of the greater facilities with which poisons can be obtained from unqualified traders cannot, however, be relied upon as a justification of such disregard on their part. This is clearly shown by the procedure to which the Patent Medicine Vendors' Association has had recourse. Foiled in the endeavour to defend the infraction of the law which has been carried on in the irregular sale of proprietary medicines, that body is now seeking for opportunities of attacking chemists for omissions which are illustrative of the general laxity which has hitherto prevailed. We may therefore take this opportunity of repeating the suggestion that chemists and druggists who are the legally authorised sellers of poison should not, even involuntarily, be found acting at variance with the law which they are, from every point of view, especially bound to respect and promote the observance of.

## WHAT IS AN OPEN SHOP?

AMONG the strange vicissitudes through which the Pharmacy Act has passed there has probably been none more remarkable than that to which it was subjected in the Exeter County Court on the occasion reported in the Journal of March 10. In the prosecution of a watchmaker for the sale of a solution of corrosive sublimate as a cure for rheumatism and other ailments, the sale was proved, and it was shown that the seller was not a registered chemist and druggist. So far it was clear that the defendant had no right to sell the article, and in the judgment given by his Honour Judge EDGE (see p. 868) it is stated that if the defendant had been sued for selling it he would have had no alternative but to have given a verdict against him as liable to a penalty for having committed a breach of the Pharmacy Act. Even the legal representative of the defendant admitted at the hearing of the case that his client had committed an offence, and thus subjected himself to penalty. But with much ingenuity he contended that while there are under the fifteenth section of the Act two offences—that of selling poison and that of keeping open shop for retailing poison—the defendant had been charged with an offence which he had not committed, inasmuch as the shop he kept was not one for retailing or dispensing poison, but a watchmaker's shop. Hence he argued the charge had not been made out.

This view of the matter considerably impressed the judge, and raised in his mind a question as to what is an open shop within the meaning of the Statute? On reference to the Act he came to the conclusion that the expression used by the legislature appeared to imply something more than the mere selling of poison in a shop, that in fact a particular class of shop is referred to, not only open and accessible to the public as a shop, but also having a notification that the business of selling poison was carried on there. From that point of view he also held that a person might be liable to a penalty under the Act for keeping such an open shop, even if no sale whatever was effected. But since the Act is a penal one, it was held that strict proof of the particular offence is absolutely necessary, and as the defendant's shop was not advertised as a place for the sale of poison, the judge could not say that it was an open shop kept for retailing poisons. On that ground he decided that the prosecution failed by an error of procedure. At the same time it was stated by the judge that what the defendant did was quite as mischievous as if he had kept an open shop for the avowed purpose of selling his specific, or even more so, and he suggested an amendment of the plaint, by consent of both parties, which would admit of the defendant pleading guilty. In order to facilitate such an arrangement the case has been adjourned for a month.

This case affords a striking illustration of the difficulty with which the administration of the Pharmacy Act is surrounded. Not only is there difficulty in obtaining knowledge of infringements and in collecting evidence sufficient to support prosecutions; but when both of those conditions have been provided for, legal technicalities may intervene to render the proceedings futile. In other instances, again, where convictions are secured, it often happens that the penalties inflicted cannot be recovered, and under both conditions the Society has to bear the entire cost. This is a consideration which should be more regarded by those members of the trade who complain that the Society does not enforce the Act so fully as they think might be done. In connection with that view of the matter it should be remembered that the whole burden of administration of the Act in the interest of the public, and for securing such protection of legally qualified chemists as it can afford, falls upon the comparatively small section of the trade which constitutes the Society. With the increased efficacy which the Pharmacy Act has acquired by the aid of recent judicial constructions there is greater possibility of its being made more useful in both its bearings, and that circumstance should be a strong inducement to all members of the trade to assist in the work which has still to be carried out.

### BENEVOLENT FUND.

We are pleased to record that the Brighton Junior Association of Pharmacy has forwarded to Mr. Richard Bremridge, through Mr. C. G. Yates, the President of the Association, a cheque for £14, representing the amount collected at the meetings of the two Brighton associations. This is a satisfactory instance of what local pharmaceutical associations are capable of doing in the way of supporting the Benevolent Fund, and may be commended as well worthy of imitation.

### DRAWINGS FOR ILLUSTRATIONS.

The simplest and most generally employed method of illustrating letterpress is by means of zinc blocks prepared by a photographic process from line drawings, done with pen and ink. In one of the recent Cantor lectures delivered before the Society of Arts by Mr. Henry Blackburn it was pointed out that the drawings should be made upon Bristol board or paper with a similar surface, with black or Indian ink that will dry with a dull surface, and a pen having a medium point. The drawing should consist entirely of clean and sharp lines, shading by means of washes being inadmissible. Photographs and shaded drawings are reproduced by a more elaborate process, which does not yield equally satisfactory results in rapid printing. In most cases it is desirable to prepare the drawings on a larger scale (⅓ to ½ larger) than it is proposed to reproduce them. Sufficient allowance must then be made for the result of reduction, some lines being necessarily thickened, whilst the amount of reduction intended should be clearly indicated in the margin. In this way it is possible by means of a simple line drawing to efficiently illustrate the text of an article or paper—whether merely describing a piece of apparatus or other object of appreciable size, or representing the magnified image of minute structures as seen under the microscope—and contributors to the Journal are requested to adopt this plan when illustrations are necessary to elucidate the text of their contributions.

### CONFERENCE MEETING AT OXFORD.

At the meeting of the Executive Committee of the British Pharmaceutical Conference on Wednesday, April 4, a provisional programme of arrangements for the Oxford meeting was submitted and agreed to. According to this programme the President, Mr. N. H. Martin, will hold a reception in the dining hall of Christ Church College on Monday evening, July 30, and deliver his address to the Conference on the following morning, in the hall of Balliol College, where the papers will subsequently be read and discussed. At the conclusion of the first day's business it is proposed to hold a garden party in the grounds of one of the colleges, and on Wednesday afternoon Magdalen College will be visited, whilst the excursion on Thursday will be down the River Isis to Abingdon, where luncheon will be served, the party being conveyed by means of house-boats, on which tea will be served during the return journey. This attractive programme has been drawn up by Messrs. G. C. Druce and H. Mathews, of Oxford, to whom the members of the Conference are greatly indebted for much time and labour expended in making the necessary provisional arrangements. The headquarters of the Conference will be at the Randolph Hotel, where the luncheons will be provided and the smoking concert held on the Wednesday evening.

### PRIZES FOR PHARMACY STUDENTS.

In connection with the Three Towns and District Chemists' Association prizes are offered for which all unqualified members of the Association are eligible. There are three prizes in chemistry, which will be given for analytical work. Those wishing to compete must give notice to the Secretary, Mr. James Cocks, Edgcumbe Street, Stonehouse, between March 15 and April 1, and the results must be sent in by May 1. In botany, two prizes will be given for the best sets of specimens, mounted on cardboard, illustrating the natural orders, of which a knowledge is required in the Minor examinations. The specimens are to be collected after April 1 and sent in by August 31. Another prize will be given for the best written paper—to contain not more than 1000 words—on one of the following subjects:—"The Present State of Pharmacy from a Student's Point of View," "How best to Prepare for the Minor." This must be sent in by May 1. It is also proposed to form a class for botanical rambles, to meet for two or three hours in the early morning, fortnightly, during the summer months. All those wishing to join should give notice to the Secretary of the Association before May 1.

# Transactions of the Pharmaceutical Society of Great Britain.

## DONATIONS.

### *To the Library in London.*

**Professor Flückiger, Bern:**

Grundriss der Pharmakognosie, 2. Aufl., 1894.

**Mr. Walter Hills, 225, Oxford Street, London:**

Berichte der deutschen chemischen Gesellschaft, 1893.

**Prof. H. Guignard, Paris:**

Recherches sur la nature et la localisation des principes actifs chez les capparidées, tropéolées, limnanthées, résédacées et papayacées, 1894.

**Prof. Greenish, 17, Bloomsbury Square, London:**

Journal of the Chemical Society, 58 nos.

**Radcliffe Library, Oxford:**

Catalogue of books added during 1893.

**Prof. Russow, Dorpat:**

Zur Kenntniss der Subsecundum- und Cymbifoliumgruppe europäischer Torfmoose, 1894.

**Dr. A. Ernst, Caracas:**

The United States of Venezuela in 1893.

**Messrs. J. B. Lippincott Co., Philadelphia:**

United States Dispensatory, by Wood, Remington, and Sadtler, 17th ed., 1894.

**Messrs. P. W. and A. H. Squire, 413, Oxford Street, London:**

Companion to the British Pharmacopœia, 16th ed., 1894.

**Dr. Theodoro Peckolt, Rio de Janeiro:**

Historia das plantas alimentares et de gozo do Brazil, 1871–84.

Historia das plantas medicinaes e uteis do Brazil, fasc. 1–2, 1888–89.

Cultivirte Cará-Arten Brasiliens, 1885.

**Mr. T. G. Forshaw, Infirmary, Bradford:**

Bradford Infirmary and Dispensary Pharmacopœia, 1878.

**Mr. F A. Hocking, Evelina Hospital, Southwark:**

Pharmacopœia of the Evelina Hospital for Sick Children, 1894.

**Association Belge des Chimistes:**

Bulletin, 7me année, 1893–94.

**Mons. J. Wauters, Brussels:**

Note sur la recherche de la saccharine dans les boissons, 1890.

Note sur l'analyse de beurre, 1893.

Les falsifications du poivre, 1888.

**College of Preceptors, London:**

Calendar, 1894.

**Mr. C. A. Barber, M.A., St. John's, Antigua:**

Three supplements to the Leeward Islands Gazette, 1894.

Report on diseases affecting the sugar-cane in Barbados, 1893.

**Mr. James Foster, Carlisle:**

A short history of druggs of the East Indies, 17— ?

### *To the Library in Edinburgh.*

**Messrs. P. W. and A. H. Squire, 413, Oxford Street, London:**

Companion to the British Pharmacopœia, 16th ed., 1894.

### *To the Museum in London.*

**Mr. H. N. Ridley, M.A., Singapore:**

Seeds of *Strychnos tieute.*

**Messrs. Jenkin and Phillips, London:**

Bitter bark from New Granada.

### *To the Herbarium.*

**Mr. Spencer Le M. Moore, F.L.S., Eastbourne:**

Seven specimens of medicinal plants from Matto Grosso.

**Baron F. von Mueller, M. and Ph.D., K.C.M.G., etc, Melbourne:**

Specimens of *Eucalyptus rudis* and nineteen other Australian plants.

### *To the Museum in Edinburgh.*

**Professor I. Bayley Balfour, M.D., F.R.S., Edinburgh:**

Herbarium specimens of *Cinchona calisaya* var. *vera*, *C. officinalis*, *C. officinalis* var. *crispa*, *C. succirubra*.

**Dr. Gordon Sharp, Leeds:**

Herbarium specimens of British plants from Strathspey district.

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## EVENING MEETING IN EDINBURGH.

*Wednesday, March* 28, 1894.

MR. J. LAIDLAW EWING IN THE CHAIR.

(*Concluded from page* 849.)

The next communication was on:—

### THE METHOD OF PREPARING CERTAIN OINTMENTS.

BY PETER BOA.

Most ointments are influenced in appearance and other physical characters by the method adopted in their preparation. If variation in these respects were the only result of different methods employed in the manufacture of ointments, I am not sure that, as this is already well known, I should have sufficient reason for bringing the subject before you. It seems to me, however, that the therapeutic efficiency of certain ointments may be unwittingly impaired in course of preparation.

Some ointments are less susceptible to influence in this way than others. Let me take, as an example of the former, red oxide of mercury ointment. If prepared according to the official directions it has a rich red colour; if the oxide were rubbed up with the cold basis the colour of the ointment would be yellow. Here there would be a distinct change in appearance, but the efficiency of the ointment would not be altered. As an example of the latter, let me take simple ointment. It contains wax, benzoated lard, and almond oil; these are directed to be melted together and constantly stirred while cooling. The effect of this constant stirring is to incorporate with the ointment a considerable quantity of air. From observations I have made, I reckon that an ointment so prepared is increased in bulk about one-sixteenth by the introduction of air. In relation to this I may quote Paris's concise definition of the object of an ointment as given in his 'Pharmacologia,' viz., "to keep the parts to which it may be applied soft and easy, and, at the same time, to exclude from them the atmospheric air." Our official simple ointment, however well it may keep a part to which it be applied "soft and easy," can scarcely be trusted to "exclude the atmospheric air," since it is itself full of it. There is not any provision made for the air being sterilised previous to incorporation with the ointment, therefore such an ointment basis, when applied to a wounded surface, may become the means of conveying to it the septic organisms, whose invasion its application is designed to prevent. Moreover, in certain skin diseases, I am told by a dermatologist, the exclusion of air from the affected part by the ointment or other remedial application is of great importance. In such a disease as ringworm, where the disease-producing organisms are dependent for life on a supply of oxygen, an ointment containing any appreciable quantity of air might defeat its own object by supplying the enemy with food while blockading their ports. Unguentum chrysarobini of the pharmacopœia is directed to be stirred till cold in the process of preparation, and must, in consequence, contain a goodly proportion of air. May it not be on this account that it is so little in favour, and so frequently discarded for more air-excluding preparations of this drug?

Our official ointments, such as simple ointment, resin ointment, spermaceti ointment, which are merely fatty ointments without any very active medication, are all directed to be stirred "till cold," "while cooling," "till quite cold," and so on. The British Pharmacopœia is not alone in so directing these ointments to be thus prepared; other pharmacopœias give the same directions. The only exception that I have noticed is Ceratum resinæ of the U.S.P., which is directed to be cooled without stirring.

I have referred to all the books to which I have access to ascertain if any reason were given for stirring. The only reason which I find stated is, that the stirring is to render the ointments homogeneous. Stirring an ointment while it is cooling introduces, as I have already indicated, a quantity of air, which has, in the first place, the effect of whitening and softening it; in the next place, if the ointment contain animal or vegetable fats, it hastens its rancidity. I am not prepared to admit that stirring renders it homogeneous. So far as my experiments indicate rather the reverse is the case. It is a very common complaint in regard to these ointments that they are apt to become lumpy in the process of making, and it is scarcely matter for surprise that they should do this when so much cold air is beaten into them. It is with the very greatest diffidence that I make the suggestion that they might with advantage be prepared without stirring. I have a very great respect for custom, and for the able men who have been concerned in the construction of our pharmacopœia, and I offer my contribution on this subject with deference to both.

If simple ointment be prepared by melting the ingredients together and allowing the ointment to cool at rest, a uniform product results. It is not lumpy, keeps twice as long as the stirred product, and as a protective dressing to an abraded surface it is incomparably better than the air-containing product. The ointment allowed to cool at rest is a little harder than the product obtained by stirring while cooling. In comparing the melting points of various ointments prepared by the two methods I have found that the official method yields a product with a melting point from one to three degrees lower than the other. This is what one would expect, for the stirred ointment is less compact, the particles being divided by air somewhat as oil is broken up by gum in an emulsion. The melting point of the more compact ointment can be reduced by simply rubbing down the ointment on a slab, and I find that ointment so rubbed down is smoother and more uniform than ointment prepared by observance of the official directions. If the hardness of ointments prepared without stirring be an objection, this can be remedied by reducing the quantity of wax. In the face of the book statements that stirring was employed in order to secure homogeneity, I had some misgivings as to whether there might not be separation of some of the harder ingredients. I bore in mind that camphor ball, which has a composition analogous to an ointment, by being poured into moulds while warm and allowed to cool as it pleases, does not appear to go wrong, but in order to satisfy myself on this point I took pieces from the top, bottom and centre of ointments, *e.g.*, simple ointment and petroleum cerate (hard paraffin, 1; soft paraffin, 2), and determined their melting points. In every case they were the same for the same specimen of ointment. Examined under a lens, no evidence of separation was evident, while a piece of stirred ointment examined under a lens was observed to contain a few small lumps. I concluded, therefore, that if any crystallisation of the harder ingredients occurred in the ointment cooled at rest, it was of so minute and uniform a character that it would be preferable in the ointment to the lumps, which appear to be almost inevitable in the ointment which has been stirred. Some of the advantages of letting such an ointment cool without stirring it are:—Comparative freedom from air; saving of labour; the ointment keeps much better, and has a brighter appearance.

Samples are on the table for inspection of:—

1. Petroleum cerate (Martindale).
2. Eucalyptus ointment B.P.
3. Resin ointment B.P.
4. Simple ointment B.P.

These have been prepared by cooling while at rest.

I have to express my thanks to my pupils, Mr. James S. Guthrie and Mr. Geo. G. Davidson, for their help in the experiments incidental to this paper.

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Mr. Nesbit said this note rather took him by surprise, as he had always followed the plan of stirring till cold, and when an ointment showed granulation he had blamed his apprentices for not stirring long enough. He thought it would tend to make the ointments harder than the stirring method.

Mr. Duncan said he had tried some experiments with the B.P. hard and soft paraffin basis. He prepared a column 5 inches long and ½ inch in diameter, and portions taken from the top, bottom and centre gave precisely the same melting point, about 110° F. to 113° F., and showed no signs to the eye of separation of hard paraffin. He should like, however, to see how the process would work with a larger quantity. He thought there would be greater risk of separation in that case than with small quantities. He had prepared a one-pound quantity for a test but, unfortunately, the vessel was smashed, and the sample came to grief. He had an impression, however, that the upper portion showed that greater hardening had taken place there than at the base.

Mr. Dott said it seemed obvious that where one fat or substance was dissolved in another, there was no occasion for stirring.

Mr. Henry said it was an advantage merely to allow the ointment to cool. The product would be less bulky and harder than when stirred. One difficulty might be the difference in colour. When stirred till cold the ointment was much whiter than when allowed to cool, and the public might suppose the higher colour indicated some difference in composition. Since hearing of Mr. Boa's proposal he had tried the method in making cold cream, and in operating on about 2½ pounds of the fatty basis he found the product perfectly homogeneous, and portions taken from top and bottom layers gave the same melting point. It would be interesting to know if the method succeeded equally well with mixtures of hard paraffin and oil alone, as there would be greater likelihood of separation in such a case than when vaseline or lard was present. Another point of importance was the rate of cooling. He had allowed his melted fats to cool on the top of a boiler where, of course, they cooled very gradually. If the melted fats were at once placed in a cool place, he thought there would be danger of separation.

Mr. Rutherford Hill said he had mentioned Mr. Boa's suggestion to a pharmacist, who was very sceptical as to its feasibility, and prepared some of the soft and hard paraffin basis. He had examined the product and found the melting point at top and bottom to be identical. The sample looked as if it was harder at the top, but on closer examination the greater hardness was more apparent than real.

Mr. C. A. Macpherson said he had for some time been employing the method suggested by Mr. Boa. In the case of resin ointment a homogeneous product was obtained, whereas if it was stirred it would be granular. In the case of such ointments there was no need to stir.

Mr. Boa, in reply, said he had not tried the process with large quantities, the largest he had made being half-a-pound. Mr. Henry, however, had evidently worked with larger quantities, and had found the result quite satisfactory. With regard to the appearance of greater hardness in some portions of the ointment, there was no evidence of separation when examined either with the naked eye or with a lens. He had not experimented with mixtures of oil and hard paraffin alone, but they had an analogous instance in the well-known crystalline pomade made with spermaceti and oil. In that case the pomade was found to be perfectly uniform when rubbed on the hand. As to the rate of cooling, the samples he had shown were simply melted and poured into chip boxes and left to cool. They showed no signs of separation.

The next communication was on:—

## GLUCOSE AS A PRESERVATIVE OF SYRUP OF IODIDE OF IRON.

BY WILLIAM LYON.

Probably there is no preparation in the Pharmacopœia which has had so many suggestions made for its preservation as syrup of iodide of iron. Six and twenty years ago its speedy decomposition was engaging the attention of pharmaceutical investigators, and as you are all aware, it has not yet been satisfactorily overcome. The various suggestions which were the outcome of these investigations have been with one exception, viz., the partial inversion of the cane sugar, proved to be either valueless or objectionable. Hammer, to whom belongs the credit of the inversion idea (*Pharmacist*, April, 1876), made a careful examination of the various decompositions which take place when the syrup is kept for some time. Shortly these are as follows: "An aqueous solution of iodide of iron is partially acted upon by the oxygen of the atmosphere and changed into free iodine and ferric oxide. The free iodine is converted by heat or direct sunlight into hydriodic acid, and if cane sugar is presented to this acid, decomposition takes place, grape sugar is formed, and iodine is again liberated. The remaining portion of the unconverted cane sugar is at the same time exerting its action upon the precipitated oxide of iron, deoxidising it, and thereby increasing the percentage of grape sugar, the liberated iodine again combining with the deoxidised iron to form iodide of iron, and when this stage is reached it prevents further decomposition, and it may now be exposed to oxidising influences, provided, however, a certain percentage of grape sugar is present in the preparation." If these conclusions are correct, the decomposition of the official syrup can only to be explained on the ground that boiling a portion of the syrup with the iodide of iron solution does not form a sufficient quantity of grape sugar to prevent a certain proportion of the iodide being liberated. As this is a matter of some interest, an endeavour was made to determine the quantity of grape sugar which is formed when the B.P. directions are strictly adhered to. In carrying out this several considerations have to be borne in mind. In the first place it is a well-known fact that the cane sugars of commerce contain a varying percentage of invert sugar; in the second place, in estimating the grape sugar with a standard solution of copper, the iodide of iron present in the syrup will precipitate a certain quantity of the copper salt, and thus interfere with the result; and, in the third place, some of the cane sugar will probably be inverted by the heat which it is necessary to apply in carrying out the estimation properly.

The cane sugar used in making the syrup was therefore estimated for invert sugar, but the quantity found was so small (it being less than ·0475 per cent.) that it was not thought necessary to make it a part of the calculations. By using a solution of iodide of iron of known strength, the quantity of that salt required to precipitate a given volume of the standard solution of copper was found. This was further confirmed by adding to the iodide of iron solution a known weight of pure glucose, and again estimating with the standard copper solution. Regarding the quantity of sugar inverted during the estimation process, as only about 2 C.c. of the syrup were used each time, it may safely be overlooked. Having thus guarded against any inaccuracy the B.P. syrup was estimated by Fehling's process, and the mean of several determinations gave ·89 per cent. of grape sugar (equivalent to about 1·3 per cent. of the sugar being displaced by glucose).

Estimation by Fehling's process is not by any means a satisfactory process, as the iodine interferes with the end reaction when an acidified solution of ferrocyanide of potassium is used as an indicator. Removal of the iodine from the syrup by nitrate of silver was tried, but the nitrate of iron was as objectionable as the iodine. Total removal of the iron salt was also tried, but the action of the removing agents interfered with the result. By practising, however, with solutions containing known quantities of glucose and iodide of iron, and dissolving some thiosulphate of soda in the indicator solution, to destroy the iodine colour, results sufficiently accurate for the purpose were obtained. It is not for a moment contended that ·89 is the exact percentage of glucose in the syrup, yet it is very probable that it is near that figure. Absolute accuracy could not reasonably be expected under the circumstances, but as further evidence, it may be remarked that a syrup with 1 per cent. of the sugar displaced by glucose decomposes at almost the same rate as the official one, when both are exposed to the same oxidising influences; whilst one containing 2 per cent. keeps for almost double the time.

Two years ago, Klie, an American pharmacist, made some experiments on glucose in syrups containing iodine compounds (*Pharm. Journ.* [3], xxiv., 262), and at a meeting of the Missouri State Pharmaceutical Association held last year he showed one sample of syrup of iodide of iron made with glucose instead of cane sugar, and another with 50 per cent. of the sugar displaced by glucose. Both had been made in March, 1892, and kept in bottles only half filled and exposed to sunlight. According to the report the syrups, at the date of the meeting, were both in good condition, and showed no trace of deterioration, and accordingly he recommended that either the whole or part of the sugar should be displaced by glucose. Judging from this that his experiments were worthy of attention, I repeated them, and also extended them to those containing a smaller proportion of glucose. The various syrups were all prepared according to the B.P. directions, the boiling of course being omitted, placed in bottles only half filled, and allowed to stand in a place not exposed to direct sunlight, and to make the test as severe as possible, the bottles were not corked, thus allowing the oxidising influence of the atmosphere full play. A B.P. syrup was placed amongst them by way of comparison. At the end of two months the B.P. syrup was, as might be expected, quite unfit for use.

The following table shows the condition of the others:—

| Percentage of cane sugar displaced by glucose. | Condition after two months' exposure. |
|---|---|
| 1 | Similar to B.P. syrup. |
| 2 | Gradual improvement as the percentage of glucose increased. |
| 4 | |
| 6 | |
| 8 | No decomposition. |
| 10 | |
| 15 | |
| 20 | |
| 25 | |
| 30 | |
| 40 | |
| 50 | |
| 100 | |

In those syrups containing more than 10 per cent. of glucose, precipitates formed, increasing in quantity as the percentage of glucose increased. This on examination proved to be principally sulphate of calcium. Commercial glucoses generally contain more or less of this salt, owing to slaked lime being used to neutralise the sulphuric acid, and the one used in making these syrups was not an exception to the rule. As this impurity is a serious objection to the use of glucose as a preservative of this syrup, a quantity of glucose was prepared and barium carbonate used to remove the sulphuric acid. Owing to the insolubility of barium sulphate there is no chance of it being present in the finished product if care is taken. A syrup prepared with such a product instead of cane sugar has not as yet precipitated, and we are therefore justified in assuming that the sulphate of calcium is the disturbing agent.

The samples which were prepared clearly show that even by displacing only 8 per cent. of the sugar by glucose there is a great improvement in the keeping properties of the syrup. If a pure glucose can be obtained no serious objection can be made to the presence of, say, 10 per cent. of it in the syrup, and with that quantity present it will keep for a considerable time without decomposing. If it can be freely exposed to the atmosphere for a couple of months without showing the least change, surely it will keep for a much longer period when in bottles full, or nearly full, and securely corked. Those syrups containing both glucose and cane sugar are slightly opalescent, whilst that made with glucose alone is as clear and elegant as the freshly prepared B.P. syrup. Presumably this is due to the presence of a trace of lime in the cane sugar, but if the glucose were free from sulphuric acid it would not likely occur.

The point to be enforced is that the glucose must be free from acids and metallic salts if any benefit is to be derived from its use as a preservative. No doubt if there was a demand for such an article manufacturers of glucose would readily meet it.

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Mr. Nesbit said he thought the B.P. process was useless, and it appeared there was not enough invert sugar produced to prevent decomposition. He had once had a sample of the syrup spoiled by being too long boiled. Some water was added to it, and it was set aside, and seemed to keep indefinitely.

Mr. Coull said he would like to ask if Mr. Lyon had examined the finished product in his glucose for barium. It was a dangerous poison. It was well known that sugar formed a soluble compound with lime, and it might also do so with barium.

Mr. Lyon, in reply, said he had not examined the glucose for barium because he did not think it could be present, as he used carbonate of barium. Sugar only formed compounds with oxides of lime or barium.

### DISCUSSION ON THE UNITED STATES PHARMACOPŒIA.

This discussion, which was adjourned from last meeting, was then resumed.

Mr. W. B. Cowie said in regard to the United States Pharmacopœia method of assaying cinchona he had made several estimations, and the results had been fairly concordant, but very low compared to those obtained by the British Pharmacopœial method. A bark which yielded 6 per cent. of total alkaloids by the British method gave only 5 per cent. by the United States method, thus showing that the former method exhausts the bark more thoroughly. Both methods gave practically the same identical results so far as the percentage of quinine was concerned. The United States method for estimating quinine gave concordant results, and was extremely quick compared to the British method. He also found, like Mr. Coull, that the quantity of menstruum ordered in the U. S. Pharmacopœia was insufficient to give 150 C.c. of percolate as required. He also agreed with Mr. Coull that it was not necessary to use a second portion, as less chloroform was required to re-dissolve the total alkaloids by the 100 C.c. than that required to extract the alkaloids from the second portion, and a great amount of unnecessary labour was saved. Considerable advantage was gained by evaporating the acid washings from the first residue to a small bulk, say 20 C.c.; for in this way extraction was much easier, and less chloroform was required. As the accuracy of the washing out depended to some extent on the volume of liquid from which the alkaloids were extracted, it would increase the accuracy of the result if a definite volume were adhered to.

Mr. Nesbit, in course of some general observations, said there would be considerable advantage if the metric weights were adopted in the British Pharmacopœia. He observed they had no aqueous or green extracts in the U. S. Pharmacopœia, and that they were rather prodigal in the use of alcohol. It would much simplify matters if they had had three or four general methods for making extracts. The same remark applied to tinctures, in regard to which there was a great deal of needless repetition and endless variety in alcoholic strength. He thought in our own Pharmacopœia many tinctures, such as tinctures of opium and calumba, would be better made with an alcohol under proof. He observed a total absence of essences in the U.S. Pharmacopœia, and suggested that these preparations in the B.P. should be 1 in 10 instead of 1 in 5. He also referred to the processes for wines and infusions, and to the fact, which he commended, that no process was given for the making of alkaloids.

On the motion of the Chairman a very hearty vote of thanks was awarded to the authors of papers.

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The Assistant Secretary drew attention to fine herbarium specimens in flower of *Cinchona calisaya*, var. *vera*, *Cinchona officinalis*, *Cinchona officinalis*, var. *crispa*, and *Cinchona succirubra*, presented by Professor I. Bayley Balfour, Regius Keeper Royal Botanic Garden, Edinburgh, and a large number of herbarium specimens of British plants, collected mostly in the district of Strathspey, by Dr. Gordon Sharp. Several books recently added to the Library were also shown.

The Chairman moved a vote of thanks to the donors, which was cordially awarded.

Mr. Nesbit said as it was the last meeting of the session, he begged to move a cordial vote of thanks to the Chairman for the ability and courtesy with which he had presided over their meetings. This was only a small part of the work Mr. Ewing did for them, and the same high qualities distinguished him in all that he did. He felt sure they would all hope to see him occupy the same position in another session, notwithstanding the fact that an election would take place before that time. It would be a great satisfaction to all of them to see him in the chair for another session. The vote was passed with acclamation.

The Chairman said he had to thank Mr. Nesbit for the too kind way in which he had spoken of his services, and all of them for the vote they had so heartily passed. He hoped that by the time another session came round they would have a larger hall to meet in. He would take this opportunity of publicly thanking Mr. Rutherford Hill for valuable assistance, and for the amount of trouble he had taken in the arranging of these meetings.

The meeting then closed.

## FIRST EXAMINATION QUESTIONS.

*April* 10, 1894.

### LATIN.

(*Time allowed—from* 11 *a.m. to* 12.30 *p.m.*)

I. *For all candidates.* Translate into Latin:—

1. I will give the man a book.
2. We have been blamed by the boy's companions.
3. The brave king praised his noble army.
4. I fear that he will not come.
5. When I receive your letter, I shall know that you are safe.

II. Translate into English either A (Caesar) or B (Virgil).

(*Candidates must not attempt both authors.*)

#### A. CAESAR.

1. His rebus adducti, et auctoritate Orgetorigis permoti, constituerunt, ea, quae ad proficiscendum pertinerent, comparare; jumentorum et carrorum quam maximum numerum coëmere; sementes quam maximas facere, ut in itinere copia frumenti suppeteret; cum proximis civitatibus pacem et amicitiam confirmare. Ad eas res conficiendas biennium sibi satis esse duxerunt; in tertium annum profectionem lege confirmant.

2. Bello superatos esse Arvernos et Rutenos ab Q. Fabio Maximo, quibus populus Romanus ignovisset, neque in provinciam redegisset, neque stipendium imposuisset. Quod si antiquissimum quodque tempus spectari oporteret, populi Romani justissimum esse in Gallia imperium; si judicium senatus observari oporteret, liberam debere esse Galliam, quam bello victam suis legibus uti voluisset.

*Grammatical Questions.*

(For those only who take Caesar.)

1. Decline, in full (singular and plural), *proximis civitatibus, eas res.* (Par. 1.)

2. Write, in full, the Indicative Present of *volo*, the Indicative Perfect of *torqueo*, the Subjunctive Pluperfect of *fero*.

3. Write in Latin:—22, 100, 317, 19*th*, 88*th*, ¾, *twice, three times as great.*

4. Explain the term *Periphrastic Conjugation*, and give two examples of its use.

#### B. VIRGIL.

1. Et jam finis erat; quum Jupiter aethere summo
Despiciens mare velivolum terrasque jacentis
Litoraque et latos populos sic vertice coeli
Constitit, et Libyae defixit lumina regnis.
Atque illum talis jactantem pectore curas,
Tristior et lacrimis oculos suffusa nitentis,
Alloquitur Venus: "O qui res hominumque Deumque
Aeternis regis imperiis et fulmine terres,
Quid meus Aeneas in te committere tantum,
Quid Troës potuere, quibus tot funera passis
Cunctus ob Italiam terrarum clauditur orbis?"

2. "O fortunati, quorum jam moenia surgunt!"
Aeneas ait, et fastigia suspicit urbis.
Infert se saeptus nebula, mirabile dictu,
Per medios, miscetque viris, neque cernitur ulli.

*Grammatical Questions.*

(For those only who take Virgil.)

1. Decline, in full (singular and plural), *proximis civitatibus, eas res.*

2. Write, in full, the Indicative Present of *volo*, the Indicative Perfect of *torqueo*, the Subjunctive Pluperfect of *fero*.

3. Write in Latin:—22, 100, 317, 19*th*, 88*th*, ¾, *twice, three times as great.*

4. Explain the term *Periphrastic Conjugation*, and give two examples of its use.

### ARITHMETIC.

(*Time allowed—from* 12.30 *p.m. to* 2 *p.m.*)

[The working of these questions, as well as the answers, must be written out in full.]

1. What is the cost of 3 tons 14 cwt. 3 qrs. 16 lbs. at 28*s*. per cwt.?

2. What will it cost to paper a room 25 ft. 8 in. long, 16 ft. 5 in. wide, and 12 ft. high, with paper 32 in. broad which costs 7¼*d*. per yard?

3. Simplify $\dfrac{\frac{1}{3}+\frac{2}{11}+\frac{7}{24}-\frac{1}{3}\text{ of }\frac{2}{11}\text{ of }\frac{7}{24}}{1-\frac{1}{3}\text{ of }\frac{2}{11}-\frac{2}{11}\text{ of }\frac{7}{24}-\frac{7}{24}\text{ of }\frac{1}{3}}.$

4. Find the value of $\cdot 8\dot{3}$ of 13*s*. 4*d*. + $\cdot 13\dot{8}$ of £1 4*s*., and express the result as a decimal of £5.

5. If 100·8 lbs. of flour support 40 men for 3 days, how many men will 46·305 cwt. support for 7·35 weeks?

6. If a man walks 11 metres in 5 seconds, how many kilometres will he walk in two hours at the same rate?

7. A person invests £6825 in the 3 per cents. at 91 he sells out £5000 stock when they have risen to 93¼, and the remainder when they have fallen to 85. How much does he gain or lose by the transaction?

### ENGLISH.

(*Time allowed—from* 3 *p.m. to* 4.30 *p.m.*)

1. Give a classification of *adverbs*, and construct a sentence containing three distinct kinds of *adverbial clauses*.

2. Parse fully:—*He ran so fast that I could not overtake him.*

3. Correct the following sentences, giving your reasons:—

(i.) His eyes are very bright, his face very pale.

(ii.) We had prevented him making a fool of himself.

(iii.) All plants do not bear flowers.

4. In the following passage supply the necessary capital letters and put in the stops and inverted commas where necessary:—the poor mother could not see for she had wept out her eyes into the lake where shall I find death who went away with my little child she asked he has not arrived here yet said an old grey haired woman who was walking about how have you found your way here and who helped you god has helped me she replied.

* 5. Write a short composition on one of the following subjects:—

(i.) The causes of Britain's commercial greatness.

(ii.) The policy of the Stuart sovereigns.

(iii.) Sympathy and Benevolence.

(iv.) "Every station of life has its appropriate duties."

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* This must be attempted by every candidate.

## EXAMINATIONS IN LONDON.

*April*, 1894.

(*Continued from page* 849).

Dr. Stevenson attended on behalf of the Privy Council.

### MINOR EXAMINATION.

*Two hundred and forty-nine* candidates were examined. *One hundred and sixty-six* failed. The undermentioned *eighty-three* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Amies, Samuel Myddleton | Ludlow. |
| Andrews, Dormer Frederick | Chatham. |
| Angel, Lorenzo Valencia | Birmingham. |
| Anthony, Everard Percival | Bedford. |
| Ashby, Charles Edmund | Weston-super-Mare. |
| Badman, William Robert | Redhill. |
| Banks, Charles Henry | Wolverhampton. |
| Banks, Edwd. Herbert Hardy | Falmouth. |
| Bayles, Robt. Haward Edgar | Norwich. |
| Beales, Walter William | Eye. |
| Beckwith, Christopher | Brighton. |
| Blyth, Wm. John Bucktrout | Sunderland. |
| Bristow, Ralph Pratt | High Wycombe. |
| Brown, Alfred | Leicester. |
| Buckle, Harold | Barnard Castle. |
| Butler, Ernest Charles | Stamford Hill. |
| Carter, John Howell | Porthleven. |
| Clear, Henry William | Potton. |
| Cranch, William John Beck | Barnstaple. |
| Crombie, Peter Rintoul | Glasgow. |
| Dand, Arthur | Carlisle. |
| Daniels, Frederic William | Leicester. |
| Davies, David | Llansawel. |
| Davies, David | Penygraig. |
| Davies, Herbert Paget | London. |
| Davis, Theophilus Morgan | London. |
| Duckworth, William | Bradford. |
| Edwards, John Griffith | Barmouth. |
| Ellis, John Alfred | Wisbech. |
| Everett, Henry Percy | Ipswich. |
| Flood, Frank | Woburn. |
| Floyd, Harry Victor | Soham. |
| Forby, Archibald | Downham Market. |
| Gili, Gerardo | London. |
| Gower, John | Carmarthen. |
| Gray, Arthur Thistle | Whitby. |
| Gunstone, Herbert Challiner | Oxford. |
| Hames, Harry Munkman | Cambridge. |
| Hart, Samuel Henry | Hull. |
| Henry, Thomas Anderson | Barrow-in-Furness. |
| Hill, Aubrey Thomas | Boston. |
| Hora, Tudor Travers | London. |
| Hughes, David | Bath. |
| Hughes, William Richard | Colwyn Bay. |
| Ingram, Fred | Wisbech. |
| Kay, Arthur Charles | Glossop. |
| King, Charles Edward | Berkhamsted. |
| Lander, Arthur | St. Keyne. |
| Ling, Ralph Michael | Beccles. |
| Llewellyn, James | Pembroke Dock. |
| Malins, Templar Edward | Newport, Mon. |
| Mannox, Gertrude Annie | Sutton Coldfield. |
| Marchant, Walter | Walthamstow. |
| Menhinick, John | St. Mabyn. |
| Morcombe, Joseph | Pembroke Dock. |
| Munday, Edgar Frederick | London. |
| Mundy, John Frederick | London. |
| Osborne, Harry Edward | Spalding. |
| Pack, Frederick James | Brighton. |
| Rees, William Edward | Llanidloes. |
| Roadknight, Charles H. W. | Atherstone. |
| Robertson, Jonathan Edwards | Stroud. |
| Robson, Nicholas White | Allendale. |
| Roper, William Isaac | Plymouth. |
| St. Cyr, Etienne Laurent N. | London. |
| Sanderson, Henry | Manchester. |
| Scott, Govan Henry | Renhold. |
| Smith, Maurice | Kidderminster. |
| Taylor, Joseph Crabtree | Southport. |
| Thorp, Ernest | Southport. |
| Tree, John | St. Leonards. |
| Walker, Alfred Ernest | Coventry. |
| Walkey, William Richard | Devonport. |
| Whittle, Hugh | Manchester. |
| Williams, George | Redruth. |
| Williams, Gregory Thomas | Cardiff. |
| Williams, Hugh Francis | Llanfyllin. |
| Wilson, Archibald Ralph | Bishop Stortford. |
| Wilson, Henry Augustus | Kenilworth. |
| Wooddisse, Frank Bagshawe | Nottingham. |
| Woodward, Robert | Old Newton. |
| Yeo, John Henry | Berry Pomeroy. |
| Young, John Arthur | Newport. |

### FIRST EXAMINATION.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Allen, Charles Trounson | Kilburn. |
| Bickle, William John | Newport Pagnell. |
| Cusin, Thomas | Kirkcaldy. |
| Davies, Emlyn Holt | Aberystwyth. |
| Evans, John William | Rhuddlan. |
| Garnham, Albert Edward | Southwark. |
| Glassoock, Frank George | Norwich. |
| Gray, Percy Bunting | Northampton. |
| Green, George Turton | Stourbridge. |
| Hall, Jasper Longsdon | Wirksworth. |
| Hawkins, Henry George | Cambridge. |
| Hill, Edmund Percy | Northampton. |
| Hinchliffe, George | Lower Weston. |
| Hobbis, George Thomas | Warwick. |
| Ireson, Ernest Edward | Newport, Mon. |
| Leslie, Bertie Samuel | Penge. |
| Millidge, Philip | Newport, I.W. |
| Pick, Frank Phillips | Barnsley. |
| Pratt, William | Shipston-on-Stour. |
| Robinson, Edward George | Lincoln. |
| Skinner, Arthur Edward | London. |
| Taylor, Archibald Leonard | Camberwell. |
| Wilson, Arthur Frederick | Kennington. |
| Young, James Clements | Manchester. |

## Proceedings of Societies in London.

### BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 16, Bloomsbury Square, on Wednesday, April 4, at 4.30 p.m.

Present:—Mr. N. H. Martin (President) in the chair, Messrs. Atkins, Carteighe, Martindale, J. H. Mathews, and J. Umney (Vice-Presidents), Mr. Moss (Treasurer), Messrs. Druce, Farr, Gerrard, and Holmes, Mr. H. Mathews (Hon. Local Secretary), Messrs. Naylor and Ransom (Hon. Gen. Secs.), and Mr. Nightingale (Assistant Secretary).

The minutes of the previous meeting were read and confirmed. Letters were read from Professor Remington, of Philadelphia, and Dr. Anton von Waldheim, of Vienna, acknowledging their election as honorary members of the Conference; from Professor Sayer, the University of Kansas, thanking the Conference for copies of 'Year-Books' presented to the University; and from Mr. Pooley on behalf of his sister, Mrs. R. H. Davies, acknowledging the letter of sympathy which had been sent as directed at the previous meeting of the Committee.

The President referred to the loss sustained by the death of Professor Bentley, a past president of the Conference, and moved that a letter of condolence be sent to Mrs. Bentley. This was seconded by Mr. Martindale, and carried unanimously.

An application was read from Mr. Bowden for a grant of £3 to defray expenses connected with a proposed research on the constituents of hemidesmus root. It was resolved that the grant be made. A sub-committee, consisting of the Treasurer and the Hon. Gen. Secretaries, was appointed to revise the Blue List, and authorised to make any alterations that should be considered desirable.

Mr. H. Mathews gave a sketch of the suggested arrangements for the meeting at Oxford. It is proposed that the reception by the President be held at the dining hall of Christ Church College on the evening of Monday, July 30. The President will deliver his address in the hall of Balliol College on the Tuesday morning, to be followed by the reading and discussion of papers. At the conclusion of the business in the afternoon it is intended to have a garden party in the grounds of one of the colleges. On the Wednesday afternoon there will be an opportunity to visit Magdalen College. The luncheons will be held at the Randolph Hotel, which will be the headquarters of the Conference. The smoking concert will be held at the hotel on Wednesday evening. Thursday will be devoted to the excursion. It is intended to take house-boats, which will convey the party down the river to Abingdon, where luncheon will be served. On the return to Oxford in the afternoon tea will be provided on board.

In accepting the suggested programme, a vote of thanks was passed to Messrs. Druce and Mathews for their kindness in coming from Oxford to lay the above proposals before the Committee.

Eleven gentlemen having been duly nominated were elected to membership.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting on Thursday, March 29, the evening was devoted to the reading of short papers by members.

The President being unavoidably absent, Mr. H. B. Care was elected to act as Chairman of the meeting, and he first called upon H. A. D. Jowett, B.Sc., to read a paper on "Diamonds," in which he described the methods adopted by Moissan to produce these artificially.

The next communication was a note on some samples of "Ung. Hyd. Mitius," by E. H. Gane, who gave analyses of four samples of this ointment, purchased from retail pharmacists, and showing results which did not reflect much credit on the sellers. No. 1 consisted of mercurial ointment diluted with palm oil, and with sulphur added to darken. It was horribly rancid. No. 2 was apparently diluted with resin ointment and hard and soft paraffins, and contained besides charcoal and an appreciable amount of phenol. No. 3 was the best of the four, and was diluted with hard and soft paraffin in place of the prepared lard. It also contained a distinct trace of iron, probably introduced in the process of manufacture. No. 4 appeared to contain a great variety of oily and waxy substances, together with numerous chemical compounds, sulphur, charcoal, resin, and an alkaloid or alkaloids in insufficient amount for certain identification. It was probably cocaine. The only suggestion put forward as to the origin of this curious mixture was that the gentleman who prepared it kept a pot in which was placed the refuse ointments from his dispensing counter, which were afterwards worked up into this peculiar preparation.

In a paper on "The Thermohydrometer," by Alex. Gunn, the author, after describing the uses of the instrument, referred to the importance of taking specific gravities under known conditions of temperature.

The next paper, on "Cantharidin," was by the same author, who recommended a modification of Greenish's method of extraction (*Pharm Journ.*, 1880, p. 729), the details being as follows:—

Take twenty-five grammes cantharides in fine powder, extract oil by petroleum ether, dry the marc; take note of petroleum ether used. Well moisten the marc with solution of potash, B.P. strength will do. Heat for some time on full water-bath, but not to dryness, then to the still moist substance add dilute hydrochloric acid to decided acidity. Evaporate now over water-bath rapidly to dryness. Powder the dried marc placed in percolator and extract with chloroform. Allow the chloroform to evaporate spontaneously. About 2 fl. oz., or a little more, of the chloroform should percolate through, but a few drops from the percolator on a watch-glass will show when the marc is exhausted. The product should be quite pure, but if contaminated with oil, wash with petroleum ether, taking note of amount used. If the final product is still coloured, it may be dissolved in chloroform, a little animal charcoal added, and allowed to stand for a few hours, then filtered, and chloroform evaporated. The residue by this method was an abundant crop of fine crystals, and indicated 0·962 per cent. cantharidin. It will thus be seen that the difference between the two methods is very slight, and as a matter of fact the modification is sanctioned by the suggestion Mr. Greenish makes in the paper referred to for the manufacture of the cantharides plaster. His objection to drying the acidulated mass of powdered cantharides is that crystallisation of the principle takes place, and it is therefore not so easily extracted; but it will be found that percolation of the dried, acidulated substance is soon accomplished, and that the mass is completely exhausted by 2 fluid ounces, or a little more, of chloroform. If it should be necessary to decolorise with animal charcoal, it will be found that the cantharidin clings with great persistence to it; the charcoal must consequently be carefully washed several times.

A note on "Strychnine and Phosphoric Acid" was also read by Mr. Gunn, who stated that he had found that strychnine—either in the crystalline or precipitated form—and phosphoric acid, of specific gravity 1·750, when mixed in quantities of about 4 ounces and 4 fluid ounces respectively, invariably developed a delicate rose tint. This was indicative of the presence of nitric acid in the phosphoric acid, and of brucine in the strychnine. The ordinary analytical methods for detecting nitric acid in phosphoric acid might give negative results, but the above mixture never failed to detect what must be infinitesimal traces.

The last communication was "A Dispensing Note," by R. H. Jones, who said he had had the following prescription shown him recently:—

| | |
|---|---|
| Quin. Hydroch. | gr. xl. |
| Sp. Chlor. | |
| Glycerin | |
| Lanolin | aa ℥ss. |
| Aq. | ad. ʒxii. |

The dispenser had found a difficulty in making a satisfactory emulsion, and could find no methods given in the literature at disposal on the subject of the dispensing of wool fat in the form of an emulsion. In the *Pharmaceutical Journal*, vol. xviii., p. 172, there was an abstract of a method by which the wool fat was first rendered perfectly anhydrous by prolonged heating over a water-bath, then mixed with half its weight of powdered gum, and finally diluted with the water. This makes a good emulsion, but is somewhat troublesome. Another method, already recorded, was to rub the wool fat with twice its weight of warm water and, during the rubbing, add soap (in the proportion of 3 grains to 1 drachm of wool fat) dissolved in about the same quantity of water, previously rubbed with the wool fat. Afterwards, the remainder of the water may be added. If these directions are carried out, a very satisfactory preparation results. With alkalies, the best way to proceed was to place the wool fat in a hot mortar, and stir in about its own weight of water, then add the alkali, dissolved in a small quantity of water and, finally, all the water required. The emulsion was of a thicker consistence, and more cream-like in appearance, if the wool fat were rubbed with its own quantity of water before adding the alkali. Half-an-ounce of wool fat requires about thirty grains of potassium carbonate, or sixty minims of liquor potassæ. Far better results, however, were obtained with mucilage and yolk of egg. If half an ounce of wool fat were placed in a warm mortar, one ounce of mucilage or one yolk of an egg added, and the water in small quantities, as is usual in making an emulsion, a perfect preparation resulted, and far less separation occurred on keeping than if alkali were employed. In dispensing the prescription, the quinine salt throws out the wool-fat if soap or alkali be employed, no doubt owing to the effect it had upon the soap or alkali. If mucilage were used, care must be taken, or the spirit would spoil the mixture. Yolk of egg, of course, was compatible with everything, and except for the fact that it made the product yellow, was by far the best agent that could be employed if wool fat were required to be emulsified either alone or in the presence of spirit or spirit and salts.

A musical and social evening in connection with the Chemists' Assistants' Association was held on Thursday, April 5, when the chair was taken by Mr. E. J. Millard. There was a very interesting programme, Messrs. H. Browne, W. Roberts, W. F. E. Horrell, H. C. Steward, C. J. Strother, W. Goatcher, A. J. Chater, S. A. Walton, Taylor, and the President contributing to the evening's amusement. Mr. H. Browne acted as accompanist, and the arrangements were under the direction of the Honorary Secretaries, Messrs. Jones and Sage. The proceeds of the sale of programmes will be devoted to the Benevolent Fund of the Pharmaceutical Society.

## Provincial Transactions.

### BRIGHTON JUNIOR ASSOCIATION OF PHARMACY.

The session of this Association was closed on March 29 with an "At Home" at the Brighton Pavilion. The guests were received in the King's Apartments by Mr. C. G. Yates, the President of the Association, and Mrs. Yates. An enjoyable concert was afterwards held, the artistes being Miss Smithson, Mr. Lauder, Mr. Hedgcock, Mr. Collins, Mr. T. Lynnes, Miss Edith Welling and Mr. G. Welling, and Mr. A. J. Barnett and Mrs. Norris appeared in a duologue. The rooms were then cleared, and dancing took place till an early hour in the morning. The company numbered about 120. The arrangements were carried out by Mr. A. E. Colman (Honorary Secretary), with an energetic committee.

## Scottish Transactions.

### GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The annual business meeting of this Association was held on Thursday, March 29. Mr. W. L. Currie, the President, occupied the chair, and the minutes of previous meeting having been adopted, Mr. James A. Russell, Treasurer, submitted his report for the past session, as follows:—Members' subscriptions, £28 15s. 6d.; expenditure for the year, £15 12s. 1d., leaving a balance of £13 3s. 5d., which, added to that of last year, left a balance in hand of £25 12s. 6d. Mr. Alexander Laing, General Secretary, read the council report, in which the work of the session was summarised, and members of the Association were recommended to lend assistance in the compilation of the new British Pharmacopœia by taking notes during the summer months, bringing them before the Association for discussion when the meetings were resumed, and forwarding the results of inquiries to Professor Attfield. The membership had increased from one hundred and sixteen to one hundred and sixty-three.

The President, in moving the adoption of the reports, asked a hearty vote of thanks to the Treasurer, Mr. Russell, and congratulated the members on the position of the Association.

The reports having been adopted, the election of office-bearers for next session was then proceeded with, when most of the old office-bearers were re-elected, only two new members joining the council, Mr. Robert Brodie and Mr. Mungo Wallace, Mr. A. Livesey being transferred to district secretary for the west, which post had been filled by Mr. Russell, as well as the office of Treasurer, and Mr. Thomas Blair was appointed Librarian.

A motion that the financial year end with the end of February was carried, and a committee, consisting of Messrs. Paris, Moir, the Secretary, and President appointed to look out for permanent rooms. A vote of thanks to the President on the motion of Mr. R. T. McCowan (Paisley) was heartily accorded, and the meeting closed.

## Parliamentary and Law Proceedings.

### PROCEEDINGS UNDER THE PHARMACY ACTS.

#### JUDGMENT IN THE EXETER CASE.

At the Exeter County Court, on Tuesday, his Honour Judge Edge gave judgment in an action brought by the Council of the Pharmaceutical Society of Great Britain against C. Hornsey, 117A, Cowick Street, St. Thomas, Exeter, watchmaker, to recover two penalties of £5 each, alleged to have been incurred by him on December 23, 1893, and on January 5, 1894, respectively, in keeping an open shop for retailing, dispensing, or compounding of poison, to wit, "corrosive sublimate," a poison in the schedule of the Pharmacy Act, 1868, contained in and forming part of the ingredients in a compound called "Hornsey's Devonshire Specific," contrary to the provisions of the said Statute (31 and 32 Vic., cap. 121).

The case was heard at the last court (see p. 767), when Mr. T. R. Grey, barrister-at-law, instructed by Messrs. Flux, Son and Co., London, appeared for the plaintiffs, and Mr. A. E. Dunn, solicitor, Exeter, for the defendant.

The Registrar (Mr. R. R. M. Daw) pointed out to the judge that the plaintiffs' solicitor had written him to he effect that they would not be represented that ay to receive judgment, as they did not wish to incur he costs of coming all the way from London.

His Honour, in delivering judgment, said: The facts of the case are these: The defendant, an old man, nearly 70 years of age, has for the last half century made up a decoction which he called "Hornsey's Devonshire Specific," which is, or is supposed to be, a cure for rheumatism and other kindred ailments. There is no doubt that it contained a considerable quantity of a deadly poison, viz., corrosive sublimate, a drug which it is unlawful for anyone to sell, unless he is a registered chemist and druggist, who has to comply with certain requirements of the Act. The defendant is not a registered chemist and druggist. His business is that of a repairer of watches and clocks, and he carries on that business in a small lock-up shop, where a person named "Stanton" formerly carried on the same business, whose name as a watch and clock repairer was over the door when the sales referred to in the evidence were made. Defendant had, therefore, no right whatever to sell this decoction, and if he had been sued for selling it I should have had no alternative but to have given a verdict for the plaintiff society for the penalties claimed. The defendant, however, is sued for keeping "an open shop for the retailing of" poison, and it is contended on his behalf that however guilty he may have been in selling this poison, he did not keep "an open shop" within the meaning of the Statute. The questions therefore are, "What is 'an open shop'"? and "Did the defendant keep one for the retailing of poisons"? I confess I was considerably puzzled at the trial by the expression used by the Legislature, as it seemed to me to imply something more than the mere selling of poison in a shop; indeed, it would appear that a person might be liable to penalties under this part of the section if no sale whatever was effected. If an unauthorised person advertised some compound containing one or more of the poisons mentioned in the Act, which made the whole decoction poisonous, and by placards or otherwise invited the public to enter his shop and buy, I think he would have contravened the Act by keeping "an open shop" even if he had never sold a single bottle of his mixture. But this is a very different case. Here the defendant undoubtedly kept an open shop for the repair of clocks and watches, which latter he exposed in his window as an intimation to the public of his trade, and as an invitation to them to enter and entrust him with their clocks and watches to repair, and if it were an offence to keep an open shop for the repair of clocks and watches he would undoubtedly have been guilty of the offence. With respect to the sale of his specific, he had nothing to show inside or outside of his premises that he dealt in such an article. He made up an old family recipe, which appears to have been known in the neighbourhood, and he sold it to those persons who applied to him for it. It was not advertised in any way, and, so far as the public generally was concerned, they had no knowledge or intimation that he dealt in it. Sitting as a jury, therefore (and it would appear from the case of Lyons *v.* Dr. Para, 11 A. & E. 326, that it is a question for the jury), I could not say this was an open shop kept for retailing poisons within the meaning of the Act. I am strengthened in this view by the use of similar words in other sections of the same Act. By section 3, a person who at the date of the passing of the Act carried on the business of a chemist and druggist by keeping an open shop for the making up or compounding of physicians' prescriptions, was entitled to be registered as a chemist and druggist. Surely this could not apply to a person who, openly carrying on another business, made up medicines from doctors' prescriptions to persons who privately applied to him. The expression "open shop," to my mind, seems to imply publicity; notice to the public that the particular business was being carried on, and an invitation to them to take part in it. It is not enough that the person claiming to be registered made up physicians' prescriptions, even though he made them up in a shop; they must have been made up in a place not only accessible to the public, but openly, *i.e.*, where the public knew they were being made up. He, in fact, must have held himself out publicly as a compounder of physicians' prescriptions. It seems to me, therefore, in the present case, that it is not sufficient to show that the defendant retailed a poison in a watchmaker's shop. It must be shown that he did it openly and publicly, and in a manner by which the public knew, or might have known, what he was doing. I am, of course, fully aware that what the defendant did was quite as mischievous, if not more so, than if he had kept an open shop for the purpose of selling his specific. But the action is a penal one, and the strictest proof of the particular offence is absolutely necessary in such an action. No application was made to me to amend the plaint, and the action fails upon what is practically an error of procedure. I am glad to think that my decision in this case does not in the least detract from the usefulness of this Act of Parliament. Further proceedings may be taken by the plaintiff society, not only for the sale of this poisonous compound, but for other infractions of the law incidental to it, but as I do not suppose the plaintiff society is desirous to ruin this old man, and as I do not think the defendant will continue selling his compound, I would suggest that, by the consent of both parties, I should amend the plaint by charging a sale on January 5, to which the defendant should plead guilty. If this course is not agreed to, the verdict must be entered for the defendant, with costs, but with a stay of execution for twenty-one days, to enable the plaintiff society to appeal, if so advised. I may add that since this judgment was arrived at I have seen the case of Kenyon *v.* Eastwood, 57 L. J. Q. B. 455, which appears to confirm the view I have taken. In that case the question was, "What is an open court?" and the Lord Chief Justice and Mr. Justice Mathew held that "open court" meant not only a court to which the public had access, but a place "with all those external signs which people are accustomed to suppose necessary for it to be a court." In this case an "open shop" for retailing of poisons must have all the external signs which show it is a shop for the sale of those articles which are proved to be in fact poisons.

Mr. Dunn, in reply to the judge, said he should like to take instructions from his client before he said anything about his Honour's suggestion as to amending the claim. He suggested that as the other side was not there that day, the case should be adjourned so as to suit both parties.

The judge said he would adjourn the case *pro formâ* for a month, and he had no doubt that in the meantime the plaintiffs would be communicated with with regard to his suggestion.

### PROSECUTION OF LEEDS CHEMISTS.

The Leeds Stipendiary Magistrate (Mr. W. Bruce) had before him, on Wednesday, at the City Police Court, four charges against local chemists. The summonses were taken out under the Pharmacy Act of 1868, and in three of the cases the charge was that of having sold a preparation known as "Cooper's Sheep Dip," which, it was alleged, contained a poison mentioned in the first part of the schedule. Mr. Dunn appeared for the prosecution, which was at the instance of Mr. Leggett, of the Patent Medicine Vendors' Association. Mr. Hannam represented Messrs. Reynolds and Branson, of Briggate and Commercial Street; Mr. Bedford (Messrs. Hopps and Bedford) appeared for Messrs. R. and S. Needham, North Street; and Mr. Peckover for Messrs. Reinhardt and Sons, Briggate, Leeds. The sale of the preparation was admitted.

Mr. Dunn said that he must ask for a substantial penalty, because a packet of the compound was sufficient to poison 500 persons. The purchase was made by an irresponsible person, of whom not a single question was asked. The provisions of the Act were well known to Mr. Reynolds, who had lately been writing on the subject in the press.

Mr. Bruce: We need not go into that; we are all conscious of other people's defects, but not of our own.

Mr. Dunn added that Mr. Reynolds was President of the Leeds Chemists' Association. Cooper's sheep dip, he said, consisted of sulphur and arsenic.

Mr. Hannam said that on behalf of his clients he had to admit that the Act applied to the compound in question. He had to point out, however, with regard to the penalty, that there was a distinction between the sale of a specific poison and of a compound which might contain poison. Messrs. Reynolds and Branson did not keep the "sheep dip" in stock, but in order to oblige a customer their assistant sent for a packet to Messrs. Goodall and Backhouse. That was the full extent of their offence. As to the respectability of his clients he need not say anything.

Mr. Bruce: Everybody knows that they are a respectable firm.

Mr. Bedford, on behalf of Messrs. Needham, contended that a nominal penalty would meet the case.

Mr. Peckover, for Messrs. Reinhardt, said that his clients were very seldom asked for the "sheep dip," which was unlikely to fall into the hands of people who would use it for a wrong purpose.

The Stipendiary said that he had thought of inflicting a nominal penalty; but if he did that in the case of respectable chemists, what should he do in the case of others? The defendants would have to pay 50*s*. in each case, including costs.

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Mr. Cuthbert George Catterall, chemist, Hyde Park Corner, Leeds, was summoned under the Pharmacy Act for having sold prussic acid, contained in a compound known as Dr. Collis Browne's Chlorodyne. Mr. Dunn prosecuted, and Mr. Arthur Willey appeared for the defence.

Mr. Rawson said that he had made a partial analysis of the mixture, and found that it contained ·005 of pure prussic acid, or 1·2 grain of commercial prussic acid. In cross-examination by Mr. Willey, witness said that a bottleful of the mixture might poison a person, but an ordinary dose would not contain more poison than was allowable. The prussic acid contained in the mixture would not be sufficient to cause death, but there were other poisonous substances in it.

Mr. Willey argued that there was no case, inasmuch as his client had only been summoned for selling prussic acid, which was present in the mixture only to the extent of an allowable dose.

Mr. Horace Davenport, London, was called, and said that the chlorodyne was manufactured by his father and himself. No prussic acid entered into its composition.

Mr. Donald McKaye, analyst, Leeds, said that he had received a bottle of chlorodyne from the same lot as that upon which the prosecution was based. Witness was not permitted to state the results of his analysis, however, and the Stipendiary intimated that he would reserve his decision for a week, as the case was one of considerable public interest.

## RECENT POISONING CASES.

### SUICIDE BY ARSENIC POISONING.

An inquest was held on Saturday, April 7, at Six Bells Inn, Chiddingly, by the deputy coroner for Sussex (Mr. E. Bedford), as to the death of Barnes, aged 28 years, a carter, employed at the Kilns Farm, Chiddingly, who appeared to have a large quantity of arsenic.

Thomas Herbert Parker, High Street, Hail chemist, said he sold the packet of arsenic prod to the deceased. It was a one pound packet. deceased said he wanted it for poisoning rats. It pure arsenic except for the colouring, which charcoal. Deceased bought it between two and o'clock on Tuesday afternoon, and gave the nam B. Barnes, of Chalvington. Witness entered it in poison book. The deceased could not write, and m his mark. Deceased was quite sober, and seemed right. It was usual to sell as large quantities as It was sold for horses and dressing sheep and o things. The deceased was whistling part of the he was in the shop.

The Deputy Coroner said the constable had weig the packet of arsenic, and it weighed 12¾ ounce that 3¼ ounces were gone.

Mr. Henry Colgate Holman, medical man, p tising at Chiddingly, said he was called to the Bells on the 4th inst., and, on arriving between and six o'clock, found the deceased lying in garden. He was quite dead. There was no exter marks to account for death. On the following d witness made a post-mortem examination. T stomach contained about a pint of a reddish-brow fluid. The coats of the stomach were highly inflame as were also the small intestines. He examined so of the fluid and found arsenic in sufficient quantitie to produce death. Two or three grains were sufficie to cause death, but the deceased had probably take a much larger quantity. Death was due to arseni poisoning.

Evidence having been given as to deceased's stat of mind, the jury returned a verdict to the effect "That deceased did feloniously kill himself by taking arsenic."—*Sussex Daily News.*

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### DEATH FROM OVERDOSE OF LAUDANUM.

On April 4 the deputy-coroner, Mr. A. Trotter, held an inquest at the Victoria Hotel, Lincoln, relative to the death of John Lamb, aged 59, who lived at No. 23, Norman Street, Lincoln, and who died from an overdose of laudanum taken by himself. Evidence was given to show that the deceased had taken a little to allay pain. Dr. Collyer expressed the opinion that the deceased being a man of weak constitution, the dose of laudanum had brought about his death, and if he had been a man of ordinary strength it might not have caused his death. The jury returned a verdict that "Deceased died from an overdose of laudanum taken by misadventure."—*Nottingham Guardian.*

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### SUICIDE BY LAUDANUM POISONING.

On April 5, Mr. F. Price, Salford coroner, held an inquest regarding the death of Wm. Hughes, 41 years of age, who lived at 76, West Worsley Street, Salford. Deceased was a packer, but had been out of employment since Christmas last and in ill-health for three years. On Wednesday he sent his son to two chemists' shops to get twopennyworth of laudanum from each, and he afterwards drank the drug in his bedroom. He was alive when found, and was taken to the Salford Hospital, but died a few minutes after his arrival. A verdict of "Suicide while temporarily insane" was returned.—*Manchester Evening News.*

### DEATH FROM OVERDOSE OF MORPHINE.

At Hammersmith, on April 6, Mr. Drew held an inquest with reference to the death of Thomas Watson, aged 68 years, formerly a factory manager, lately residing in the Goldhawk Road, Shepherd's Bush, who died from the effects of an overdose of morphine. It was shown that deceased had taken some solution of morphine which he had obtained from a dentist, a personal friend, who said he obliged him with the morphine, cautioning him as to its dangerous nature, and advising him to see a doctor. He gave him about two and a half grains. Deceased said he was used to taking it, and added that he put it in water. Dr. Hill-Wilson said death was due to morphine poisoning. The jury returned a verdict of "Accidental death," and asked the coroner to caution the dentist.—*Standard.*

### SUICIDE BY VERMIN KILLER.

An inquest was held at the Victoria Law Courts, Birmingham, on April 4, respecting the death of Frances Elizabeth Tomalin, aged 27, of 1, back 46, Grant Street, who had admitted having taken a quantity of vermin poison containing strychnine. From further evidence adduced it appeared that when deceased purchased the poison the chemist at first refused to sell her any unless she brought a witness. She thereupon went into the street, stopped a young woman named Bertha Higgins, and requested her to accompany her to the shop, saying that her house was overrun with mice, and she wished to clear them out. Higgins consented, and both signed a form, deceased giving a fictitious name and address. The coroner, in summing up, commented on the manner in which this form was drawn up, suggesting that the address of the witness should be given. A verdict of "Suicide whilst temporarily insane" was recorded.—*Birmingham Argus.*

### POISONING BY INFANTS' CORDIAL.

An inquest was held on Monday, April 9, by Mr. F. Price, the Salford Borough Coroner, concerning the death of a female infant, aged three weeks, the daughter of a fish hawker living at 3, Knowles Street, Pendleton, named Francis Joseph Smallman. The deceased had constantly vomited food, and was a weakly child. On the previous Tuesday night the mother gave it three drops of infants' cordial, and four more drops on the following evening. The deceased became drowsy, and died on Thursday night. Dr. Somers was called to the child on Thursday afternoon, and found symptoms of opium poisoning. An empty bottle was shown to him, and he was told that a few drops of the fluid it had contained had been given to the child on the previous night. He had no doubt the child had died from the effects of opium poisoning. The jury returned a verdict of "Death by misadventure."—*Manchester Courier.*

### ATTEMPTED SUICIDE WITH BELLADONNA.

At the Chertsey Petty Sessions, on Wednesday, April 4, Mary Grimes, a married woman, of Bagshot, 50 years of age, was charged with attempting to commit suicide on March 22.

Dr. W. H. Twort, of Camberley, who has a branch surgery at the Mariner's Inn, said he went to see prisoner at about 10.30 p.m. on March 22. Prisoner was then delirious from the effect of belladonna. The bottle produced was labelled with the name of an acid, which fortunately had been replaced with a small quantity of belladonna. It had been taken from his surgery, to which prisoner had had access for several years. On recovering, prisoner acknowledged that she took the bottle from the surgery, and that no one else was to blame. She also admitted drinking the poison, and that she thought the bottle contained prussic acid, which she thought was the quickest poison. There was not a sufficient quantity of belladonna to kill the woman, but the same quantity of prussic acid would have caused instant death.

Prisoner, who reserved her defence, was committed for trial at the next Quarter Sessions, bail being allowed.—*Surrey Times.*

### CASE OF POISONING BY LAUDANUM.

On Friday, April 6, Mr. J. Troutbeck held an inquiry at the Board Room, Ebury Bridge, touching the death of Lucy Henrietta Johnston, aged 38. Dr. Henry Scott Elliott, house physician at St. George's Hospital, said he had made a post-mortem examination, and found no organic disease to account for death. In all probability death was due to the laudanum. The jury, after a short deliberation, returned a verdict of "Death from laudanum poisoning," but there was not sufficient evidence to show whether she took it with the intent to commit suicide.—*West Middlesex Advertiser.*

### CARBOLIC ACID POISONING CASES.

A married woman named Frances Hutchinson, aged 48, of 89, Russell Street, Loughborough, died on Saturday last under circumstances which pointed to her having committed suicide. Dr. Pike said deceased was unconscious when he arrived. He used the stomach pump, but death ensued about ten o'clock, the symptoms all being consistent with carbolic acid poisoning. The Coroner: Carbolic acid is not one of the poisons scheduled under the Poisons Act, is it?—No, it is not. The Coroner: Yet it is a deadly poison?—Yes, most deadly, almost as deadly as prussic acid. In reply to the coroner, his officer said he had been to the shop at which the acid was purchased, but found that no one had any knowledge of selling it, and no entry was made of the sale. The coroner said they were not bound to do more than the law required of them, but, in his judgment, poison ought not to be served in a medicine bottle. The carbolic acid was in a bottle constructed to contain medicine intended to be taken, and it was marked in tablespoon doses for the purpose. In this case he did not say it made any difference, but it might very easily mislead anyone. He would like to see a change in the law making it compulsory for poisons to be served in bottles of a particular colour or shape, or made in such a way that they could not be taken hold of without anyone knowing that they were poison bottles. The jury returned a verdict of "Suicide during insanity."—*Leicester Post.*

On April 9, Mr. T. H. Stanley, coroner, held an inquest at the Cottage Hospital on the body of Mary Ann Attkins, aged 34, wife of Mr. H. D. Attkins, grocer, Park Street, Walsall. Dr. Oliver deposed that there was a bottle of carbolic acid on the dressing-table, and a corkscrew beside it, showing that it had been recently opened. About 7½ oz. had been taken out of the bottle, and he came to the conclusion that the deceased had drunk the whole of it. Death was due to the acid. A verdict of "Suicide whilst temporarily insane" was returned.—*Birmingham Daily Post.*

Mr. S. F. Langham held an inquest on April 9, at St. Bartholomew's Hospital, with reference to the death of George Reuben Thompson, aged 21, a wood-cutter, living at Ironmonger Row, Lever Street, St. Luke's, who had poisoned himself. Dr. Horne said some commercial carbolic was found in the deceased's stomach, death being due to the poison, and the jury returned a verdict of "Suicide during temporary insanity."—*Echo.*

On Saturday last an inquest was held at the Church Inn, Huddersfield Road, Stalybridge, before Mr. Francis Newton, coroner, touching the death of Sarah Alice Lyons from drinking carbolic acid. The jury returned a verdict to the effect that death had occurred from drinking carbolic acid during a state of temporary insanity.—*Ashton-under-Lyne Reporter.*

An inquest was held by Mr. A. Small, deputy city coroner, on April 9, on the body of Dinah Manson, aged 48, of Sandall Street, Bradford Road, Manchester, who had poisoned herself with carbolic acid. The jury returned a verdict of "Suicide whilst insane."—*Manchester Courier.*

## PROCEEDINGS UNDER THE WEIGHTS AND MEASURES ACTS.

UNJUST BEAM SCALES AND UNSTAMPED WEIGHTS.

On Monday, April 2, at the Marylebone Petty Sessions, held at the Court House, Marylebone Lane, Henry Herbert, chemist, of 49, Great James Street, Lisson Grove, was charged under the "Weights and Measures Acts, 1878 and 1889," with having two beam-scales which were alleged to be unjust. The magistrate imposed a fine of £1. Defendant was also fined 10*s.* for having eleven weights which were not stamped.—*Marylebone Mercury.*

## Reviews and Notices of Books.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS. Vol. XXIX. 1893. Edited by W. S. CHURCH, M.D., and W. J. WALSHAM, F.R.C.S.[*]

This volume of Reports, like its predecessors, contains some admirable and valuable articles. The bulk of the contributions are of surgical import. Thus Mr. Harrison Cripps writes on Ovariotomy, Dr Champneys on the Removal of Uterine Appendages, Mr. Gifford Nash on Torsion of the Spermatic Cord, and Dr. Church on Hydatid Cysts. Mr. Butlin furnishes an account of a year's surgical work in his wards, in which he demonstrates the necessity of strict antiseptic measures in the surgical practice of large hospitals. Dr. Vincent Harris and G. A. Crace-Calvert publish an interesting research into the Human Pancreatic Ferments in Disease, the object being to determine whether any marked change takes place in the amount or strength of the human pancreatic ferments in disease, but the investigation did not lead to any definite results. The volume contains some valuable papers from Sir Dyce Duckworth, Dr. Norman Moore, Dr. Herringham on Chronic Peritonitis and its Treatment, and an interesting article by Dr. Claye Shaw on the Early Stages of Acute Insanity. The book ends with the usual Hospital Medical and Surgical Records and an account of the Medical School for 1839.

## Answers to Correspondents.

*W. H. Burrell.*—Whiting coloured with alkaline decoction of brazil wood.

*M. G.*—Not unless he has passed through a proper curriculum and become a licentiate in dental surgery of some medical authority.

"*Infirmary.*"—See the Calendar of the Pharmaceutical Society for the current year, where full information on the subject is given.

⁂ The publication of several letters and reports of meetings is unavoidably deferred.

## Diary of the Week.

### MONDAY, APRIL 16.

*Society of Chemical Industry* (*London Section*), at 8 p.m.

"The Treatment of Gold Ore at the Witwatersrand (Transvaal) Gold Fields," by H. de Mosenthal.

"Note on Modification of Ferric Chloride Distillation Process for Estimation of Arsenic in Copper," by F. Platten.

### TUESDAY, APRIL 17.

*Royal Institution of Great Britain*, at 3 p.m.

"Electric Illumination" (third lecture), by Professor J. A. Fleming.

### WEDNESDAY, APRIL 18.

*Edinburgh Chemists' Assistants' and Apprentices' Association*, at 9.15 p.m.

Annual Business Meeting.

Presentation of Prizes.

*Royal Microscopical Society*, at 8 p.m.

"On an Eocene Deposit of Diatomaceæ—Origin of a Fossil Lake in New Jersey, and the identification of it by the Diatoms found in the Deposits," by Dr. A. M. Edwards.

*The Western Chemists' Association* (*of London*), at 9 p.m.

Discussion on the Pharmacy Act Amendment Bill. Introduced by R. A. Robinson.

### THURSDAY, APRIL 19.

*Chemical Society*, at 8 p.m.

"Action of Metals on Strong Acids," by G. J. Burch and J. W. Dodgson.

"Action of Light on Oxalic Acid," by Dr. A. Richardson.

"English Jute Fibre, II.," by A. Pears, junr.

"Natural Oxycelluloses," by C. Smith.

*School of Pharmacy Students' Association*, at 7 p.m.

"Malt and Malting," by A. E. Skinner.

"Report on Botany," by E. Goulding.

*Chemists' Assistants' Association*, at 8.30 p.m.

"Rectified Spirit," by C. Edward Sage.

Discussion on the draft Pharmacy Act Amendment Bill.

*Midland Pharmaceutical Association*, at 8 p.m.

Discussion of Trade Topics at the Mason College.

*Liverpool Chemists' Association*, at 7 p.m.

"Note on Lin. Saponis," by J. T. Hornblower.

*Linnean Society of London*, at 8 p.m.

"A Monograph of the Acetabulariæ," by Professor Graf zu Solms-Laubach.

### FRIDAY, APRIL 20.

*Royal Institution of Great Britain*, at 9 p.m.

"Early British Races," by Dr. John G. Garson.

*Quekett Microscopical Club*, at 8 p.m.

Ordinary Meeting.

### SATURDAY, APRIL 21.

*Quekett Microscopical Club*, at 2 p.m.

Excursion to Chingford.

## Notices to Contributors.

⁂ *Matter intended for publication must be written in ink on one side of the paper only. No notice can be taken of anonymous communications, and whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*Names of plants should be underlined, and capitals used for generic names only.*

*When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines, must be supplied with the text.*

*Communications should reach the Editorial Department before noon on Wednesday, if publication be desired in the next issue of the Journal; though this cannot always be guaranteed.*

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bradley, Cocks, Grierson, Hill, Hughes, Lowther, Mitchell, Roberts, Sharp, Smith.

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[*] London: Smith, Elder & Co. Pp. i.-xxix., 1 to 410. 8*s.* 6*d.*

# ASPHODEL ROOT;

## AN ADULTERANT OF WHITE HELLEBORE.

BY HENRY G. GREENISH,

*Professor of Materia Medica to the Pharmaceutical Society of Great Britain.*

White hellebore root, the rhizome and roots of *Veratrum album*, L., is used to a considerable extent in this country, chiefly in veterinary medicine. Adulteration or substitution appears to be of rare occurrence and to be limited, judging from the literature of the subject, to the substitution of the rhizome of *Veratrum viride*, Ait., from which it can scarcely be distinguished with certainty, that of *Veratrum nigrum*, L., which is much smaller, and that of the rhizome of an unknown scitaminaceous plant.[*]

It was therefore interesting to learn from Messrs. Hodgkinson, Treacher and Clarke that a quantity of a rhizome and roots, both loose and attached, had been found, together with a little gentian root, in a bale of white hellebore imported from Genoa, and said to have been collected in northern Italy.

This rhizome varies considerably in size, measuring usually about one and a half inches in length and half an inch in thickness; it is erect, or nearly so, and often crowned with the brownish remains of smooth amplexicaul leaf-bases, or sometimes with the fibres left after their decay. It is dark brownish externally, yellowish internally, showing very numerous glistening groups of raphides and irregular fibrovascular bundles.

To this rhizome numerous roots, varying generally from three to six inches in length, are attached; near to the rhizome they exhibit a fusiform tuberous enlargement two to four inches long and three-eighths to three-fourths of an inch thick, tapering abruptly to about crow-quill size, and thus assuming the shape of an Indian club. These roots are also dark brown in colour, much shrunken and wrinkled longitudinally and transversely; they are more or less spongy, yellowish-brown, and frequently moist internally, showing under the lens a distinct cortical portion separated from a central column by a complete ring of tissue. The taste is sweetish.

The fusiform enlargement of the roots sufficiently distinguishes this drug from white hellebore; the rhizome is easily recognised by its yellowish colour (internally), spongy texture, and abundance of raphides.

A transverse section of the thin portion of a root, towards the extremity, shows a thin-walled epiblema, some of the cells of which have been apparently elongated into root-hairs; within the epiblema is a layer of cells (exodermis) of more or less polygonal or rounded outline, and thickened especially on the outer walls. The next layer forms a cork cambium producing (here) two or three rows of cork cells; all these cells are suberised and the outer are lignified.

The extra-stelar parenchyma is thin-walled and much fissured; near the outer and inner circumference are cells containing bundles of acicular raphides. The endodermis is well marked; groups of the cells of which it is composed are thickened on the radial and inner tangential walls, the others remain thin-walled. The pericycle consists of a single row of cells, within which are the phloem and xylem bundles, the latter so closely approximated as to form an almost continuous circle, supported internally by a complete ring of sclerenchymatous cells. The intra-stelar ground-tissue is much broken or almost wanting.

A radial section shows considerable axial elongation of the cells of the epiblema, exodermis, endodermis, pericycle, and sclerenchyma; the latter have truncate or blunt ends and simple pores.

As the tuberous portion is approached, the structure shows notable differences (Fig. 1); the exodermis (Fig. 1, Ep.), or even the cork cells, have replaced the epiblema; the cork-layer numbers frequently three or four rows of cells (Fig. 1, C.), usually more or less thickened, or it may number ten or twelve rows and remain thin-walled; the extra-stelar parenchyma (Fig. 1, Par.) is much fissured, and many cells are collapsed into strands of tissue, but younger roots appear more solid. The cells of the endodermis (Figs. 1 and 2, End.) have lost their one-sided thickening and appear uniformly thin-walled, and the cells of the pericycle (Fig. 2, Per.) frequently show considerable tangential elongation. The xylem and phloem groups (Fig. 1, Xyl., Phl.) are arranged alternately at tolerably regular intervals, the former being accompanied by isolated sclerenchymatous cells (Fig. 2, Scl.), of which there is no longer a complete ring and which, towards the centre of the enlargement, entirely disappear. The intra-stelar ground tissue is frequently represented by small projecting masses or transverse bands of parenchyma containing here and there a vessel (Fig. 2, V.) and sclerenchymatous cells; in the more solid roots the ground tissue may be nearly intact.

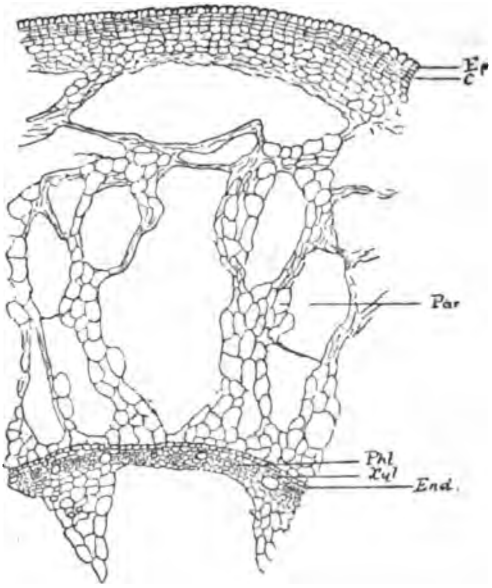

Fig. 1.—Transverse section of tuberous root (x30). (In this and the following illustration the cell contents have been omitted).

As the enlargement diminishes towards the rhizome, the xylem and phloem groups approach one another more closely, the sclerenchymatous cells reappear and form a complete ring, and the structure resembles that of the root before it became enlarged.

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[*] Holmes (*Pharm. Journ.* [3], xxii., 877).

Many of the parenchymatous cells of the extra- and intra-stelar ground tissue contain a yellow amorphous substance soluble in spirit and also, with production of a blood-red coloration, in solution of caustic potash. In the sections examined starch was not present, but an abundance of copper-reducing sugar (?) could be detected by Fehling's solution. Calcium oxalate in the form of bundles of acicular crystals was sometimes abundant.

The structure of the rhizome presents fewer points of interest. The tegumentary tissue consists of several layers of cork cells, the endodermis is so much interrupted as to be difficult to detect. Numerous closed concentric (changing to collateral) fibro-vascular bundles traverse in all directions the whole of the ground tissue, which further contains innumerable bundles of acicular raphides and minute starch grains.

The drug is therefore certainly monocotyledonous, and is also probably liliaceous. Many plants belonging to the natural order Liliaceæ are characterised by their swollen tuberous roots; the drug in question is probably derived from *Asphodelus albus*, Willd., a plant enjoying a wide distribution over Southern Europe, from the Pyrenees to Hungary and Greece, growing in valleys or on elevated hills, or in the region of beeches and pines (as in the Pyrenees, Dauphiné, and Maritime Alps), frequently in considerable quantity. The rhizomes and roots of the dried specimens in the national herbaria closely resemble the drug, exhibiting numerous raphides in the rhizome and more or less spongy structure of the roots, together with similar leaf-bases and fibres.

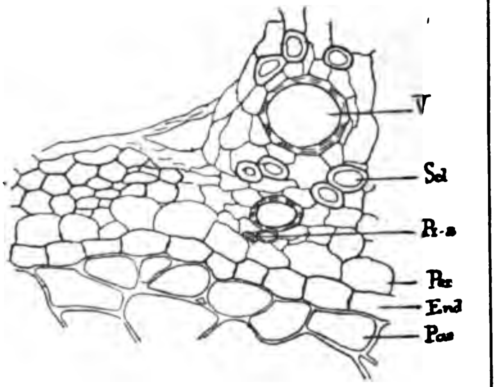

Fig. 2.—Portion of transverse section of tuberous root. (x160). Pr-x=protoxylem.

A root of the plant cultivated at Kew* exhibits a practically identical structure. Here, too, the epiblema is soon replaced by an exodermis, and the extra-stelar ground tissue, which, however, is not fissured, contains bundles of acicular raphides. Some of the endodermis cells in the thin root are thickened on one side, but in the tuberous portion are uniformly thin-walled, and both they and the cells of the pericycle are identical in shape and size with those of the drug; the circle of xylem and phloem bundles is supported by a ring of sclerenchymatous cells of similar size and shape. Many of the cells of the ground tissue contain a pale yellow substance, which does not turn blood-red, but only darkens in colour on the addition of caustic potash. This difference between the cultivated plant and the drug examined is probably the result of age, since a dried specimen from another source yielded the characteristic blood-red coloration, and exhibited a structure similar to that described.

Although the root of the white asphodel is not now used in medicine it (or that of the closely allied *A. ramosus*, Linn.) enjoyed a considerable reputation among the Greeks and Romans. It is mentioned by Hippocrates, Theophrastus, Dioscorides, and Pliny.* Galen† refers to it both as a medicine and as a nutritious root used in times of scarcity as a food substance by the peasants. Similar statements are made by Martiny himself‡ and by Lemery.§ The root is said to contain a volatile substance, bassorin, starch, and so much cane sugar as to have offered sufficient inducement to cultivate it as a sugar-producing plant,‖ whilst its medicinal properties were supposed to have been diuretic and aperient.

## THE NOMENCLATURE AND FORMULÆ OF CARBON COMPOUNDS.

### *Derivatives of the Hydrocarbons.*

In the previous article on this subject (see *ante*, p. 86) hydrocarbons were briefly considered in such a manner that the derivatives of these can now be dealt with. The simplest derivatives are the alcohols, which are hydroxides of the alkyl radicals, as methyl alcohol $CH_3OH$, ethyl alcohol $C_2H_5OH$, benzyl alcohol $C_6H_5{\cdot}CH_2OH$, etc. The term alcohol is only applied to those bodies in which the hydroxyl group (OH) is attached to an "open chain" residue; when it is united to a "closed chain" residue, the compound is termed a phenol, and has generally a specific name, as phenol $C_6H_5OH$, cresol $CH_3{\cdot}C_6H_4OH$, etc. It should be noted that benzyl alcohol and cresol are both formed by substituting hydroxyl for hydrogen in toluene, but one is an alcohol and the other a phenol, the difference between them depending on the attachment of the hydroxyl to one part or the other of the molecule, as shown by the above formulæ.

Alcohols derived from the paraffins are divided into primary, secondary, and tertiary alcohols, according to whether the carbon atom to which the hydroxyl is attached is also attached to two atoms of hydrogen, or to one atom, or to none at all; the characteristic groupings of the three kinds of alcohols, thus being respectively, $-CH_2OH$, $=CHOH$, and $\equiv COH$. As all hydrocarbons of the paraffin series may be regarded as derivatives of methane, so all the corresponding alcohols may be viewed as derived from methyl alcohol. The latter is termed carbinol, and the constitution of an alcohol is frequently indicated by reference to it, as in the following examples:—

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* Kindly forwarded by Mr. Jackson, Curator of the Museum.

* Martiny, 'Encyklopädie,' ii., 437.

† 'De aliment. facult.,' ii.

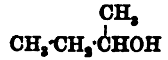
‡ *Loc. cit.*

§ 'Dictionnaire des Drogues,' p. 57.

‖ Wiggers, 'Pharmakognosie,' 1864, 128.

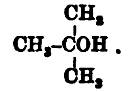
$CH_3{\cdot}CH_2{\cdot}CH_2{\cdot}CH_2OH$

Normal butyl alcohol, or propyl carbinol.



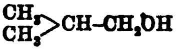
$$\begin{array}{c} \qquad\qquad CH_3 \\ \qquad\qquad | \\ CH_3{\cdot}CH_2{\cdot}CHOH \end{array}$$

Secondary butyl alcohol, or methyl ethyl carbinol.



$$\begin{array}{c} \quad CH_3 \\ \quad | \\ CH_3{-}COH\,. \\ \quad | \\ \quad CH_3 \end{array}$$

Tertiary butyl alcohol, or trimethyl carbinol.



$$\begin{array}{l} CH_3 \\ CH_3 \end{array}\!\!>CH{-}CH_2OH$$

Isobutyl alcohol, or isopropyl carbinol.

$C_6H_5{\cdot}CH_2OH$

Benzyl alcohol, or phenyl carbinol.

Another kind of alcohol is seen in those which contain two hydroxyl groups; these are termed glycols, as ethylene glycol, $C_2H_4(OH)_2$. Similarly trihydric and other polyhydric alcohols may be formed, as glycerol, $C_3H_5(OH)_3$; mannitol, $C_6H_8(OH)_6$, etc. Also dihydric and trihydric phenols, as resorcinol, $C_6H_4(OH)_2$; pyrogallol, $C_6H_3(OH)_3$.

The similarity of these alcohols, or hydroxyl derivatives of hydrocarbons, to the hydroxides of metals, should be noted. Monohydric alcohols or phenols are analogous to hydroxides of monad metals, as $CH_3OH$, $C_6H_5OH$, $NaOH$, etc.; dihydric alcohols to hydroxides of dyad metals, as $C_2H_4(OH)_2$, $C_6H_4(OH)_2$, $Ca(OH)_2$, and so on. The same resemblance is shown in the formation of salts from the alcohols: methyl alcohol forms an acid sulphate, $(CH_3)HSO_4$; a normal sulphate, $(CH_3)_2SO_4$; a chloride, $CH_3Cl$, and other salts, in which the methyl group plays a part similar to that taken by the sodium in the corresponding salts, $NaHSO_4$, $Na_2SO_4$, $NaCl$, etc. Again, the chloride of the dibasic ethylene, $C_2H_4Cl_2$, corresponds to the chloride of a dibasic metal, as $CaCl_2$. The same analogy is shown by the derivatives of poly-hydric alcohols, to compounds of polyvalent metals.

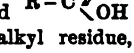
All organic bodies which are characterised by containing the OH group receive names ending in "ol," with the exception of acids, which will be dealt with later. The termination has been given to the non-alcoholic substances indol, pyrrol, furfurol, anethol, etc., but as these have been shown not to contain hydroxyl, the names indole, pyrrole, furfuraldehyde, anetholl, etc., have been substituted. Other substances have received names not ending in "ol," and later have been shown to contain hydroxyl; in these cases the termination has been changed by addition or substitution, as resorcin into resorcinol, erythrite into erythrol.

Very similar to the alcohols and phenols are the mercaptans, or alkyl hydrosulphides; these are substances containing the $-SH$ group instead of the $-OH$ found in alcohols, as ethyl mercaptan, $C_2H_5{\cdot}SH$, phenyl mercaptan, $C_6H_5{\cdot}SH$, etc.

Just in the same way as the name alcohol is restricted to hydroxides of alkyl residues, so the term ether is only applied correctly to oxides of these radicals. Since these alkyl residues are univalent, that is, have one free bond, and the oxygen atom is bivalent, two radicals, either similar or dissimilar, will be united to one atom of oxygen; the ethers will thus have the general formula $R_2O$, where R stands for any alkyl residue, or $R-O-R'$ where R′ stands for any second alkyl residue. These oxides, or ethers, will be seen to be analogous to the oxides of monad metals, as $Na_2O$, just as the alcohols are analogous to metallic hydroxides. Ordinary ether of commerce is ethyl ether $(C_2H_5)_2O$.

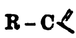
The sulphur ethers, or alkyl sulphides, stand in the same relation to ethers that mercaptans do to alcohols; that is, the oxygen of the ether is replaced by sulphur, as, for example, in ethyl sulphide, $(C_2H_5)_2S$.

Organic acids are characterised by complete similarity of structure as regards one part of the molecule, the general formula for such bodies being as here represented. R may here stand for an atom of hydrogen, or any alkyl residue, or any such residue, part of the hydrogen of which has been substituted by some other grouping, as $HCOOH$, $CH_3COOH$, $CH_2(NH_2)COOH$. The characteristic group of acids $-COOH$ is known as the carboxyl group. It is the hydrogen of this group alone which is capable of being replaced by metals, so that an acid containing only one such group in the molecule is monobasic, an acid containing two such is di-basic, etc. When the hydrogen is replaced by an alkyl residue an alkyl salt is formed; these bodies are known as esters or ethereal salts, sometimes as compound ethers, but this term is now generally abandoned in favour of one of the former. Acetic acid, $CH_3COOH$, may be taken as an example; if the acid hydrogen is replaced by the ethyl group $(C_2H_5)$, the resulting compound, $CH_3COOC_2H_5$, is called ethyl acetate or acetic ethyl ester; it is the substance commonly termed acetic ether.

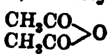


$$R-C\begin{array}{l} {\nearrow}O \\ {\searrow}OH \end{array}$$

Other derivatives of the organic acids besides ethereal salts may be obtained, and in some of these the hydroxyl (OH) group is replaced instead of only the hydrogen as in salts. The portion of the acid entering into the composition of the substance so obtained, and represented as shown, may be conveniently referred to as a separate grouping, as it enters and leaves compounds without breaking down, although such groupings cannot be isolated. This portion of the acid is termed the acid radical or acid residue, and is specifically designated by the same name as the acid, but with the termination -yl in place of the -ic of the latter. Thus in acetic acid $CH_3COOH$ the characteristic radical is acetyl $CH_3CO$; in benzoic acid $C_6H_5COOH$ it is benzoyl $C_6H_5CO$, and so on. These radicals readily form compounds with the halogens as acetyl chloride $CH_3COCl$; their compounds with oxygen are the anhydrides of the acids, as acetyl oxide, or acetic anhydride.



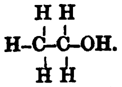
$$R-C\begin{array}{l} {\nearrow}O \\ {\searrow} \end{array}$$



$$\begin{array}{l} CH_3CO \\ CH_3CO \end{array}\!\!>O$$

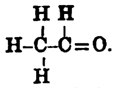
Acetyl oxide.

Aldehydes constitute an important class of bodies occupying a position intermediate between alcohols and acids. Their characteristic structure and relations to those classes of compounds may perhaps be best understood by studying a simple member of the group, acetic aldehyde. This is obtained from ethyl alcohol, the graphic formula for which is as here represented. When this compound is oxidised, two atoms of hydrogen are withdrawn from the molecule, and the compound formed is shown by the formula representing acetic aldehyde; on further oxidation it passes into acetic acid. Thus it is seen that the characteristic grouping of the aldehyde is represented by the accompanying formula, and the general formula for such bodies is RCHO. As an aldehyde invariably forms an acid on oxidation, it is often spoken of as the aldehyde of that acid. Acetic aldehyde is the "aldehyde" of the British Pharmacopœia. Other common members of this group of compounds are formic aldehyde, H·CHO; benzoic aldehyde (oil of bitter almonds), $C_6H_5{\cdot}CHO$; cinnamic aldehyde (in oil of cinnamon and oil of cassia), $C_6H_5{\cdot}C_2H_2{\cdot}CHO$; trichlor-acetic aldehyde (chloral), $CCl_3{\cdot}CHO$.



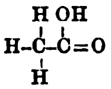
$$\begin{array}{ccccc} & H & & H & \\ & | & & | & \\ H- & C & - & C & -OH. \\ & | & & | & \\ & H & & H & \end{array}$$

Ethyl alcohol.



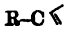
$$\begin{array}{ccccc} & H & & H & \\ & | & & | & \\ H- & C & - & C & =O. \\ & | & & & \\ & H & & & \end{array}$$

Acetic aldehyde.



$$\begin{array}{ccccc} & H & & OH & \\ & | & & | & \\ H- & C & - & C & =O \\ & | & & & \\ & H & & & \end{array}$$

Acetic acid.



$$R{-}C\begin{array}{l}\diagup H\\ \diagdown\!\!\diagdown O\end{array}$$

If the hydrogen of the CHO group of an aldehyde is replaced by a radical, the resulting compound is called a ketone; the general formula for these bodies will be $R_2CO$ or RR′CO. Acetone $(CH_3)_2CO$ is a familiar instance of a ketone.

*(To be continued).*

## PROPOSED INCREASED DUTIES ON SPIRITS, ETC.

Amongst the resolutions reported by the Committee of Ways and Means to the House of Commons, and agreed to on Wednesday, were the following:—

"That, in addition to the duties of customs now payable on spirits, there shall be charged and paid the duties following (that is to say):—

| | £ | s. | d. | Former Duties. £ | s. | d. |
|---|---|---|---|---|---|---|
| "For every gallon computed at proof of spirits of any description except perfumed spirits ............... | 0 | 0 | 6 | 0 | 10 | 10 per gn. |
| "For every gallon of perfumed spirits............... | 0 | 0 | 10 | 0 | 17 | 3 per gn. |
| "For every gallon of liqueurs, cordials, mixtures, and other preparations entered in such a manner as to indicate that the strength is not to be tested ........................ | 0 | 0 | 8 | 0 | 14 | 8 per gn. |

"And the duties of customs on the articles hereinafter mentioned, being articles of which spirits are a part or ingredient, shall be proportionately increased, and shall be as follows:—

| | | | | Former Duties. | | |
|---|---|---|---|---|---|---|
| Chloral hydrate............... | 0 | 1 | 4 | 0 | 1 | 3 per lb. |
| Chloroform........................ | 0 | 3 | 3 | 0 | 3 | 1 per lb. |
| Collodion ......................... | 1 | 6 | 3 | 1 | 5 | 3 per gn. |
| Ether, acetic ................... | 0 | 1 | 11 | 0 | 1 | 10 per lb. |
| Ether, butyric ............... | 0 | 16 | 5 | 0 | 15 | 8 per gn. |
| Ether, sulphuric .. ......... | 1 | 7 | 5 | 1 | 6 | 2 per gn. |
| Ethyl, iodide of............... | 0 | 14 | 3 | 0 | 13 | 7 per gn. |

"That in addition to the duty of excise now payable for every gallon computed at proof of spirits distilled in the United Kingdom there shall be charged and paid the duty of sixpence, and so in proportion for any less quantity."

## VIIIth INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

### SECTION XIX.—PHARMACY.

### PROVISIONAL PROGRAMME.

President:—Dr. F. Jármay.

Honorary Presidents:—Dr. Arp. Bókai, Dr. Chrl. Kiss, Dr. Alb. Lengyel, Chl. Thán, Dr. L. Tóth, J. Török.

Secretaries:—Dr. S. Fischer, Dr. J. Kóssa, Dr. St. Moldoványi, A. Török.

The foreign honorary presidents will be elected by the executive committee as soon as it is known who intend to take part in the Congress.

*Subjects selected for Discussion.*

I.

I. International Pharmacopœia.

2. Qualification of pharmacists.

3. System of control for the free establishment and control of druggists' shops.

4. In what manner would it be possible to reduce the price of medicines so as to make them cheap for the poorer classes, especially for the rural population.

5. Latest notes on the keeping and preserving of drugs.

II.

1. The dispensing of drugs or medicines by physicians.

2. The proper regulation of staté control over druggists' shops.

3. The sanitary evils arising from the sale of medicines the composition of which is kept secret.

4. The definition of herbs and the anatomical parts of herbs, as contained in the pharmacopœia.

5. The appropriate fitting up of the several parts of the pharmacist's premises.

6. The comparison of the quantitative analytical methods, as contained in the different pharmacopœias.

7. The rational denomination of new drugs.

8. The drugs of ancient and of present times.

9. Incompatible drugs.

10. Explosive combinations of medicine.

11. International unity for maximum doses.

12. Uniformity in the form of prescription.

13. Permanganate of soda as an antidote for phosphorus.

14. Should the pharmacist be an examiner of food, drinks, and other articles of consumption?

15. Tokaj wine as a remedy.

16. Of the preparations of quinine, and of the quantitative determination of pure quinine.

17. The newest apparatus necessary for the examination of drugs.

18. Introduction and making known of Hungary's medicinal plants.

19. The limits of sensibility in the more important reactions as described in various pharmacopœias.

20. The determination of the active parts of the more important tinctures and extracts.

21. Colour blindness amongst pharmacists.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, APRIL 21, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

DR. C. MÜLLER, the General Secretary of the Executive Committee which is carrying out the arrangements for the Congress which will take place at Buda-Pesth in September, has forwarded a communication stating that the preliminary arrangements for the scientific part of the Congress are now completed, and that a selection has been made of the various subjects, the discussion of which is considered to be necessary and desirable. A provisional programme has been drawn up and circulated for the information of intending visitors, with a statement of the officers appointed in connection with the several sections. In order to insure the success of the Congress it is now requisite that those who intend to be present and to take part in the proceedings by reading papers or otherwise should communicate with the General Secretary to that effect. His address is Rochus-Hospital, Buda-Pesth.

A feature of interest for pharmacists in this Congress is the circumstance that the Organising Committee has created a special section for pharmacy, of which Dr. JULIUS JARMAY has been appointed President, and he has issued a circular pointing out that the hearty co-operation and moral support of pharmacists in all countries will be essential for promoting the success of this section. He therefore appeals to all who are connected with the practice of pharmacy to render some assistance in the work. A list of the subjects which have already been selected for discussion in the Pharmaceutical Section of the Congress will be found at page 876. Pharmacists desiring to read a paper upon any of those subjects or upon some subject not included in that list are requested to place themselves in communication with Dr. JARMAY—IV. Zöldfa utcza, Budapest—who will furnish any further information that may be desired. The list of subjects given is not exhaustive, and it is hoped that they may be supplemented by the suggestion of others.

## PHARMACEUTICAL ORGANISATION.

MUCH as the importance of union and co-operation has been insisted upon from time to time as a necessary condition of the general welfare of all who are engaged in the practice of pharmacy, there are probably few occupations in which there is such a deficiency of internal organisation or such a remarkable neglect of the provision which has been made to facilitate combined action for the benefit of the entire body. The advantages offered in that respect by the Society which has now been for more than fifty years the recognised representative of British pharmacy have never been adequately appreciated. For purposes of protection or of defence, and for advancing the credit of the 'calling, those advantages could not well be surpassed. But the facts annually recorded in the Reports of the Registrar under the Pharmacy Acts show that only a small number of legally qualified chemists appear to have perceived that membership of the Society offers a possibility of self-government and trade protection such as the followers of few occupations have at their command. It is a common mistake to regard the Pharmaceutical Society as a body which governs the trade, although the majority of the trade have no connection with it, and probably no small portion of the hostile feeling entertained by some is based upon that misconception as much as upon the circumstance that the Society is entrusted, on behalf of the public as well as the trade, with the duty of testing the qualification of persons desirous of obtaining legal qualification. But that idea is entirely erroneous. There is undoubtedly a vast power of government vested in the Pharmaceutical Society, but that power can only be exercised by the members of the Society, and its capability of governing the trade will consequently be greater or less in proportion as its membership is co-extensive with the number of persons on the Register of chemists and druggists. In short, the organisation of the Society is especially devised to provide for self-government, and the complaint sometimes heard, that the Society has neglected to do this or that which it is thought might have been done for the benefit of the trade, amounts to nothing more than the statement that the majority of members of the trade have neglected to take advantage of the opportunities offered to them for taking action for their own benefit. Complaint of the Society's inactivity or of the policy it adopts is nothing short of self-condemnation on the part of the complainers, whether they be members of the Society or not.

There are, however, some circumstances which have had the effect of preventing members of the trade from connecting themselves with the Society. Among these the entrance fee formerly required from chemists and druggists who were placed on the register in virtue of having been in business before 1868 was for a long time stated to have been an obstacle of the kind. That has now been done away with, but there are still some four thousand chemists in that position who have failed to avail themselves of the abolition of the entrance fee, and still remain unconnected with the Society, though the advantages of membership are fully open to them. Many of those who obtain registration by passing the Minor examination also abstain from connecting themselves with the Society, and there is some ground of excuse for the omission, inasmuch as they cannot, under existing conditions, become members of the Society. The Bill to amend the Pharmacy Act, 1868, which is now about to be introduced into Parliament, proposes to remove that obstacle to the extension of the Society, and in the event of its being passed, every registered chemist and druggist will have the opportunity of becoming a member of the Pharmaceutical Society, and being in a position of perfect equality with other registered persons in regard to internal organisation and control. That would be an altered condition which should contribute to a very great extent towards making the roll of the Society co-extensive with the number of persons on the Register of chemists and druggists.

But while the object of the Bill which has been drafted by the Council is to provide in this way for the future, its more immediate intention is to remove the disabilities of a large number of persons who have obtained the legal qualification and have joined the Society in the capacity of associates. No less than between two and three thousand persons are in that position. More than half the number are in business on their own account, they pay the same annual subscription as members, but are not eligible as members of the Council. Putting on one side for the moment the grade of pharmaceutical chemist, as being a voluntary qualification, there is considerable reason for the opinion that in regard to membership of the Society all legally qualified chemists should stand upon an equality, and have the same claim to be admitted to all the privileges of membership. The recognition of this principle is by no means of recent date, but hitherto the attempts to carry it out in practice have been unsuccessful. Its adoption is now extended to associates not in business on their own account, and by a reversion to the original plan of the Society, the grade of associate will in future be reserved for students or assistants who have not passed the qualifying examination. This amendment of the Pharmacy Act and the alteration in the constitution of the Pharmaceutical Society which it is intended to effect, should have the result of largely increasing the disposition to become connected with the Society, for while it is an act of justice towards those now in the position of associates, it is a proof of the desire that the Society should be thoroughly representative, that, in fact, it and the trade should be identical.

### BENEVOLENT FUND.

As will be gathered from the report on page 884, the Benevolent Fund has again benefited by the action of a local association, the sum of £1 6*s*. 9*d*. having been collected at a smoking concert recently held in connection with the Liverpool Pharmaceutical Students' Society.

### THE ANNUAL DINNER.

We are asked to announce that the tickets for the annual dinner of the members of the Pharmaceutical Society and their friends, to be held on Tuesday, May 22, are now ready. The Honorary Secretary, Mr. Richard Bremridge, will be glad to hear from those intending to be present how many tickets they will require, and the names of the gentlemen for whom they are intended, as early as possible. The Committee will thus be assisted in arranging that friends should be seated together. Applications for tickets, accompanied by a remittance, must be received not later than Saturday, May 19, in order to enable the Secretary to make the necessary detailed arrangements. The price of each ticket is, as usual, one guinea.

### COMPLIMENT TO MESSRS. STEPHENSON AND KINNINMONT.

We understand that the past and present members of the Board of Examiners for Scotland entertained Mr. J. B. Stephenson and Mr. Alexander Kinninmont at a complimentary dinner in the Balmoral Hotel, Princes Street, on the evening of Wednesday, 11th inst., on the occasion of their retiring from the Board after many years' service. In the unavoidable absence of the President, Mr. Michael Carteighe, the chair was taken by Mr. J. Nesbit, Chairman of the Board, who was supported by Mr. D. Storrar, Kirkcaldy, representing the Council of the Society, and Mr. J. Laidlaw Ewing, as Chairman of the Executive of the North British Branch. Mr. Alexander Noble acted as Croupier. In the course of the evening a telegram was read conveying the felicitations and good wishes of the President to Messrs. Stephenson and Kinninmont.

### PROSECUTIONS AT LEEDS.

In the brief reports published last week (pp. 869 870) of the cases under the Pharmacy Act at Leeds, it was not specially indicated that the proceedings were taken under the seventeenth section, and it would appear, from inquiries on the subject, that an impression prevails that the defendants were proceeded against for selling poisons, whereas the actual offence charged in each case was selling without the proper formalities. Thus, in connection with the sale both of "Cooper's Sheep Dip" and chlorodyne, it was asserted that the defendants did not make entries of the sale of arsenic and prussic acid, respectively, in their poisons books. Under the seventeenth section any person can take action for breach of the regulations therein specified, the case being heard in a court of summary procedure, as in the Leeds prosecutions.

### SCIENTIFIC APPOINTMENT.

Dr. W. A. Tilden, F.R.S., Professor of Chemistry at Mason College, Birmingham, has been appointed Professor of Chemistry at the Royal College of Science, South Kensington, in connection with the Department of Science and Art, the former Professor, Dr. Thorpe, F.R.S., having accepted the office of chief analyst to the Inland Revenue Department. As is well known, Professor Tilden is an ex-Bell scholar and prizeman in the Pharmaceutical Society's School of Pharmacy. He was appointed Professor of Chemistry at the opening of Mason College in 1880, and has recently retired from the position of President of the Institute of Chemistry.

# Transactions of the Pharmaceutical Society of Great Britain.

## EXAMINATIONS IN EDINBURGH.

*April*, 1894.

Present—Messrs. Boa, Dott. Fraser, Gibson, Jack, Maben, Nesbit, and Sutherland.

Professor Sir Douglas Maclagan attended on behalf of the Privy Council.

### MAJOR EXAMINATION.

*Three* candidates were examined. *Two* failed. The undermentioned passed, and was declared qualified to be registered as a Pharmaceutical Chemist:—

Richardson, William ............Liverpool.

### MINOR EXAMINATION.

*One hundred and fifteen* candidates were examined. *Seventy-seven* failed. The undermentioned *thirty-eight* passed, and were declared qualified to be registered as Chemists and Druggists:—

| | |
|---|---|
| Aitken, Robert | Stockton-on-Tees. |
| Batty, Thomas Edward | York. |
| Beath, John | Fossoway. |
| Beattie, Peter Rattray | Newport, Fife. |
| Bentley, John Thomas | Cullingworth. |
| Brackenbury, Walter Robert | Bardney. |
| Brooks, John William | Bolton. |
| Brown, Christian Charles | Tintern. |
| Calvert, William David | Barnsley. |
| Campbell, John Henry | New Wortley. |
| Campsall, Arthur Wright | Rotherham. |
| Crichton, George | Kilmarnock. |
| Davidson, Robert | Montrose. |
| Eaton, Robert | Sutton. |
| Fernie, James | Dundee. |
| Fraser, Charles | Chester. |
| Freeland, John | Bathgate. |
| Gordon, George | Huntly. |
| Gordon, John Alexander | Edinburgh. |
| Gray, Charles Leith Hay | Old Aberdeen. |
| Harrison, Thomas Blair | Sunderland. |
| Horner, Thomas William | Leeds. |
| Jones, Thomas Charles | Connah's Quay. |
| Lewis, Harold | Hull. |
| Linley, Albert Ernest | York. |
| Macintosh, Robert | Grantown. |
| McVittie, David John | Langholm. |
| Munro, William Alexander | Hawick. |
| Nicholson, John Gordon | Carnoustie. |
| Parker, William | Derby. |
| Pennington, John Richard | Worksop. |
| Roberts, Edward | Bala. |
| Robertson, Joseph | Aberdeen. |
| Sloan, Charles Alexander | Dumfries. |
| Stringer, John Oswald | Preston. |
| Thompson, John Cooke | Tunstall. |
| Veitch, George Hutchison | Glasgow. |
| Walker, John Dalling | Peebles. |

# Proceedings of Societies in London

## THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

At a meeting of the Western Chemists' Association, held on Wednesday, the 18th inst., Mr. W. Martindale in the chair, a discussion took place on the proposed Pharmacy Acts Amendment Bill, 1894, a large number of members being present.

Mr. R. A. Robinson, in opening the discussion, said that the Bill seemed to him so simple and non-contentious that he felt there was little to be said or discussed. He fully agreed with the Bill, and thought it would be productive of much good, inasmuch as it would tend to unite the members of the trade and consolidate the Society, which, he considered, was the first step towards making any progress. He felt, however, that he must take some exception to the latter part of clause 3, whereby the number of chemists and druggists eligible for election on the Council of the Society was limited to ten. He considered this a mistake which rather spoilt the good intentions of the other clauses of the Bill, as he thought all the members of the Society should be on an equal footing, and at liberty to elect the members they thought best fitted to take office as councillors. He would therefore move the following resolution :—"This Association cordially approves the Draft Pharmacy Act Amendment Bill, recently adopted by the Pharmaceutical Council, with the exception of the words in clause 3, limiting the number of representatives on the Council of members who are not on the Register of Pharmaceutical Chemists, being strongly of opinion that any limitation of equality of representation would injuriously affect that unity it is so desirable to promote, and therefore no such limitation should be placed upon any qualified member of the Society being elected to the Council." Mr. Urwick seconded Mr. Robinson's resolution, thinking it would be decidedly detrimental to the interests of the Bill if the latter part of the clause were allowed to remain. Mr. Hyslop spoke strongly in favour of the Bill as drafted, and thought it was unlikely that the number of chemists and druggists elected on the Council would exceed those of pharmaceutical chemists. Mr. Butt supported Mr. Robinson, and said that he was much pleased that the Society had proposed bringing forward the Bill, which entirely agreed with opinions that he had previously expressed on the subject. Mr. R. H. Parker considered the Bill a move in the right direction, and would like to see all those who had passed the qualifying examination made members of the Society, and suggested that a higher fee should be made for the examination, the annual subscription to the Society being merely nominal. Mr. Taylow, Mr. Marsh and Mr. Pickard all spoke in favour of the Bill and Mr. Robinson's amendment. Mr. Allen thought that it would perhaps be better to submit Mr. Robinson's amendment to the Council for their consideration, before putting it to the meeting as a resolution.

Mr. Hyslop then proposed and Mr. Cracknell seconded, that Mr. Robinson's amendment be omitted from the resolution, which was put to the meeting and lost. Mr. Robinson's resolution was then put to the meeting as a whole, and carried unanimously. Mr. Robinson proposed and Mr. Parker seconded a vote of thanks to Mr. Martindale for his conduct in the chair, which was carried unanimously. The meeting then terminated.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At a meeting held on March 5, the following paper was read:—

### THE CHEMISTRY OF AGRICULTURE.

BY T. TICKLE.

Plants obtain their food substance both from the soil and atmosphere. We cannot alter the composition or condition of the latter, but we can modify the soil so as to favour plant growth, and through the medium of the soil may even modify the relation of the atmosphere to plant life. This work is called agriculture.

In this short paper it will only be possible to treat of the following three heads in a cursory manner: what constitutes a soil, what impoverishes, and what enriches it.

The constituents of a soil may be divided into two classes, organic and inorganic. The latter may be sub-divided into substances soluble in water, such as salts of the alkali metals; substances soluble in weak acids, as certain salts of the alkaline earths; and substances totally insoluble, as quartz and many silicates. The total amount of organic matter is classed under the name of "humus," comprising a great number of decomposition products of animal and vegetable life.

But to comprehend the nature of a soil best, its formation should be studied out of the primitive rock, for with this, its mother substance, are associated in greater or less abundance all the inorganic elements necessary to plant life.

The solid rock gradually becomes disintegrated by "weathering." It is to a small extent broken by alternately expanding and contracting with heat and cold. Water enters by the cracks formed, and dissolving out soluble substances, makes minute channels. Then when frost comes and the water in these channels is converted into ice, with increase of volume, the great force of expansion it exerts ruptures particle from particle throughout, so that the frozen part that contained water becomes finely pulverised. Now, when wet it retains moisture, owing to its porosity, and gives foothold, so to speak, to a few lichens, mosses, or other low forms of life. As these are reproduced and replaced, the mother plants decay and produce the first sign of humus. Next, small members of the higher plants make their appearance, and constitute another agency by which disintegration of the rock is assisted; for besides pouring out acid sap, which dissolves many substances insoluble in water, the roots exert a mechanical disruptive force. The thin surface soil thus produced accumulates in valleys and low lying parts, through being washed by overflow streams or rain water, and soon becomes deep enough to bear small shrubs, and at length forest trees.

The elements absorbed by plants are of three classes: food substances proper; substances which may be called condiments, for they bear the same relation to the plant that salt does to animals; and casual constituents. The elements of the true food substances are carbon, hydrogen, oxygen, nitrogen, sulphur, and phosphorous. Those of the nature of condiments are potassium, sodium, calcium, magnesium, silicon, iron, and chlorine. The casual constituents are bromine, iodine, aluminium, zinc, copper, zirconium, and lithium.

All the elements of the first group belong to the protoplasm and are essential. Although those of the second group are always present, they are not all essential. Potassium is necessary for the healthy development of the plant, and cannot be replaced by sodium, and iron must be present or no chlorophyll will be produced. Few plants thrive well without calcium; its function appears to be to rid the vegetable sap of injurious acids by forming insoluble salts with them. Silicon was long a subject of dispute, but it is now believed that most, if not all, the graminaceæ can do well without it. Even the theory that its presence gives rigidity to the haulm is disproved. Of the third group copper is poisonous, while the others are inert.

Humus has always been commonly regarded as an enriching constituent of the soil, and the earthy decayed wood from the hollow of a dead tree is generally sought to fill pots for greenhouse plants. Liebig, however, argued about the year 1840 that humus was to be looked upon as a consequence rather than a cause of fertility. He pointed out that while saprophytes were suited to derive their carbon from already elaborated material in the shape of decaying organic matter, the higher plants on the other hand were only adapted to obtain carbon from the carbon dioxide of the atmosphere. Besides, the acid matters contained in humus were non-diffusible and could not therefore be absorbed. But others, among them Berthelot, maintain the belief that humus does furnish carbon to the higher plants as well as to those of saprophytic nature. Humic acid, one of the chief constituents of humus, a substance having a complex molecule, forms sodium and potassium compounds, which, however colloid in character, could not be more difficultly dialysable than the silicates of those metals; and since these colloidal silicates are so largely absorbed by plants which can thrive well without them, it is considered probable that sodium and potassium humates are also absorbed by roots of plants. Although experiments to settle this point have not been wanting from time to time, no positive proof has been furnished of either theory.

But whether humus furnishes carbon to the plant or not, it certainly plays an important part towards the plant economy. In the first place, it provides the plant with most of the nitrogen it can avail itself of. Now, the importance of abundance of nitrogen is well known and strikingly apparent when one contrasts the rich green colour and vigorous growth of the plant when it is present with the lack of these characters when it is scarce. Proportional to the amount of nitrogen present is the production of carbohydrate material.

Secondly, the humus has an important mechanical action. Its fine state of division gives it a great extent of surface. In which respect it resembles charcoal, and it also resembles it in its property of adhering with great force to matters held in solution by water, and in condensing gases within its pores. So when wetted it will absorb a large quantity of water, and in a season of drought will remain moist and cool, saving the crops from being scorched by the sun. It would seem to possess more than the ordinary attraction for water than its extensive surface and porosity could give it, for it not only retains water very persistently when one attempts to dry it, but it eagerly condenses the vapour of water usually contained in the air during fine weather. Its property allied to that of charcoal is of great importance. The soluble contents of sewage water are almost completely removed by percolation through soil rich in humus. Nitrates, phosphates, and other salts are forcibly retained by it, although naturally a great excess of water would wash soluble nitrates out little by little.

Thirdly, by slow oxidation it yields much carbon dioxide, and this being formed *in situ*, and at once subject both to the condensing influence of the humus matter and the solvent action of the water contained, is held there, so that the greatest benefit may be realised from its solvent action upon the calcium and magnesium carbonates, by which action it assists root-sap to render these capable of absorption.

Because of this the composition of the air contained in the soil is very different from that of the atmosphere. It would not be unusual to find the gases of the soil one hundred times richer in carbon dioxide than the air, and in wet weather after recent manuring they have been known to contain not less than four hundred times as much.

The value of a soil depends very greatly upon the nature of the subsoil or bed on which it lies. It is much impaired if the free percolation of water down through it is hindered. A subsoil of clay which from its fine state of division, and probably also from its chemical character, holds water tenaciously without allowing it to pass through, renders the soil above it water-logged with stagnant water.

When after a rainfall the water sinks through a permeable soil, air must follow. Now the importance of a free access of air to the soil is great. Seeds cannot germinate without oxygen. In the absence of atmospheric oxygen the decomposing carbonaceous matter of the soil exerts a reducing action. Sulphates and ferric oxide are reduced together, and ferrous sulphide is produced which is poisonous to vegetation. When the soil is in this state and is improved by draining so that air is admitted, the colour changes from black to bright red, owing to the oxidation of iron, curiously resembling in behaviour the hæmoglobin of blood. But although the subsoil must be permeable to water, it must not be of such character as to drain it away too rapidly. An open gravelly subsoil facilitates the escape of soluble plant food by the rapidity with which it would carry away rain water. It would also allow the soil to become burnt up in a dry season.

With regard to the losses a soil suffers, the most important are nitrates, phosphates, sulphates, and potassium salts. When land is kept in grass for the purpose of grazing cattle the loss is at a minimum, for most of the matter the animals derive from the soil through the grass is returned to it in the animal manure. But with dairy farming a loss is soon observed in phosphates, owing to the fact that a large quantity passes into the milk. If the grass be mown and stacked for winter food the manure from the cattle-sheds is annually returned to the field. In the case of arable land, where both grain and straw or roots, as the case may be, are carried away, the loss is greater.

Among the causes which injure a soil may be mentioned the formation of what are known as pans. A pan is a dense layer just beneath the soil at about the depth to which the plough acts. There are various kinds. One, the calcareous pan, is formed by the caking of lime with silicious substances forming a cement. Another, the indurated pan, results from repeatedly ploughing at the same depth, by which the subsoil becomes beaten by the treading of the horses. The calcareous pan is destroyed by a stout instrument drawn by several horses, known as a subsoiler, while the indurated pan is got rid of by simply using the ordinary plough to a greater depth.

Now, turning to the ways in which a soil is enriched, there is first the natural process of weathering. The ancient practice of allowing a field to rest one year out of every seven owed its success mainly to the setting free of new soluble material from the stony substances as these broke up. Then there is the application of the manure from cattle sheds, and a word should be said as to the chemistry associated with this. The manure from the sheds is stacked in heaps, so that the supply of air is limited and oxidation and fermentation take place very slowly. In oxidation the carbonaceous matter produces various acid bodies. Side by side with this the fermentation of urea goes on. Urea, which is the chief nitrogenous constituent of the manure, is converted by a species of yeast, *Torula ureæ*, into ammonium carbonate. The change is represented by the equation, $CO(NH_2)_2 + 2H_2O = (NH_4)_2CO_3$.

The ammonium carbonate reacts with the acids produced by oxidation, forming less volatile salts. Afterwards, chiefly after distribution in the field, the ammonia is converted into nitrous acid by the agency of a micro-organism, and the nitrites formed by the nitrous acid are further oxidised by another bacterium into nitrates.

This change is favourable, since nitrates are of greater value for nitrogen than ammonium salts to the higher plants. Which fact stands in accordance with the contrast in relation to food shown between the higher plants and higher animals. The higher plants are suited to elaborate their protoplasm from simple material, while the higher animals can only build up their protoplasm from material already elaborated. The one accumulates potential energy, while the other dissipates it.

But the supply of farmyard manure is limited, therefore recourse is had to material artificially prepared which contains the enriching constituents of soils, and the manufacture of these artificial manures is now very extensive.

Nitrate of sodium obtained from Chili is used as a source of nitrogen, also sulphate of ammonium from gas-works. Care must be taken that the latter is free from thiocyanates, which are poisonous to plant life. For phosphorus, calcium superphosphate or crushed bones are used; while for sulphur, gypsum is the most convenient source. Mixtures of these in various proportions are sold under different names by the manufacturers. An analysis of the soil is valuable for indicating what proportion of these salts should be added when once the conditions best suited to the crop in question are known.

Sometimes the accumulation of humus is so great as to choke the soil up. It becomes heavy and tenacious, and excludes the air, the action of which is so important. Lime is the best remedy for this condition. Quicklime, freshly slaked, is distributed over the field, which is then ploughed, so that the lime is mixed with the earth. The lime neutralises the acids of the humus, and causes the soil to become lighter and more porous.

A few words should be said about draining. Every soil should be well drained, either naturally or artificially. The object of draining is not so much to dry a soil as to make a free exit for water, in order that it may freely percolate through.

When a soil is wet to supersaturation because water cannot flow away through an impervious subsoil beneath it, the common method of draining answers very well. This is to dig a furrow of a suitable depth from two to four feet, and either fill the bottom with rough stones or lay in a system of clay pipes and place the earth back on the top. In this way superfluous water is made to flow away in the direction the drain slopes as fast as it accumulates. But sometimes the soil is supersaturated with water for a different reason. If the soil lies upon a water-bearing stratum, through which water flows from a source higher than itself, there will be a pressure tending to drive water through the soil upwards. Successful draining in such a case can only be accomplished by tapping the underlying stratum itself, so as to relieve the pressure which drives the water up through the soil. This is usually done by simply boring a hole through the earth as far as this stratum, when the water will rush up, filling the hole, and may be led away by a sufficiently large drain.

Connected with this method is an interesting story of Elkington, the inventor. While puzzling over his want of success in draining a certain field, a man came by with a crowbar. Elkington took the bar and, either in a fit of disgust or, at any rate, without a known purpose, drove it strongly through the bottom of the drain furrow. He happened to strike the source of water, which was not deep, so that it flowed out in a copious stream. Returning shortly after, he found that that part of the field was effectually drained.

Returning to the subject of nitrogen, it is interesting to notice that although plants are not able to absorb it directly from the atmosphere, at least the plants of one natural order obtain indirectly a considerable amount from that source.

It had long been known that the amount of combined nitrogen in soils was liable to increase, and it was attributed in part to the oxidation of nitrogen by discharges of atmospheric electricity, and subsequent washing down of the products by rain water, and also in part to the evaporation of water which according to Schönbein, produces small quantities of ammonium nitrite, according to the equation—

$$N_2 + 2H_2O = NH_4NO_2.$$

But it is now known that large quantities of free nitrogen become fixed by the agency of a bacterium, which lives on the roots of various plants, but particularly those of the natural order Leguminosæ, upon which it produces warty excrescences.

It had been noticed that on removing a crop of peas, vetches, or lupins, containing much nitrogen, that in spite of the amount removed, the soil was generally richer in nitrogen than before sowing the crop. The nodules had also been observed on the roots of these plants and associated with the work of bacteria, but for a long time were not connected with this observed increase in nitrogen. Hellriegel was the first to throw light upon the matter. He cultivated various plants in pots of pure quartz sand, adding to all nitrogen-free nutritive solutions. Then to one series of pots he added no nitrogen at all, to a second series a certain proportion as sodium nitrate, to a third a higher proportion, and so on.

In the case of most plants the growth was proportional to the amount of nitrogen added; but in the case of the Leguminosæ it was not so. Most of the plants throve well at first, but those not fed with nitrogen soon showed an unhealthy appearance, due to want of it. A few of the leguminous plants, however, apparently subject to the same conditions, grew vigorously; and it was found that where they had grown well there was an abundant development of nodules, whereas where the growth was stunted these were absent. He then instituted experiments to determine whether by properly infecting a soil he could induce the formation of nodules and copious growth, and by excluding the infection could prevent this. Portions of a soil in which plants bearing the nodules had been grown were shaken with water and the insoluble matter allowed to subside. Portions of this decanted water were added to one series of pots, and sterilised portions of the same water were added to a second series. The result was that wherever the soil extract was added, nodules were formed, while in the cases where the extract was first sterilised none were produced.

Since then many more experiments confirming these results have been conducted by various workers, notably Sir J. B. Lawes and Sir J. H. Gilbert, at Rothamsted, Winogradsky, and others.

The growth of the organism with the host is symbiotic, that is to say, it is not a parasite, for it contributes as much to the well-being of the host as the host does to that of the organism.

Winogradsky has obtained from the soil a mixture of three species of bacilli, of which one species alone has the power of fixing atmospheric nitrogen.

This species is anaerobic, while the other two are aerobic. It seems anomalous at first that an anaerobe should thrive as well as this does in the earth which is so free to the action of the air; but experiment proves that the two aerobic species, which are always associated with it, use up the free oxygen in the aqueous medium in which they live with sufficient rapidity to protect the anaerobe from its action.

Winogradsky also finds that this organism, when cultivated alone and *in vacuo*, produces a considerable quantity of free hydrogen. The conclusion he arrives at is that the nitrogen is fixed in being converted into ammonia by this hydrogen in a nascent condition within the protoplasm.

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At the meeting held on Thursday, April 12, a paper was read by Mr. Francis H. Carr on "Recent Advance in Chemical Theory." In the short discussion which followed, the President remarked upon the value that chemical theory had been to trade, and remarks were also made by Messrs. R. H. Jones and E. H. Gane.

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### ROYAL MICROSCOPICAL SOCIETY.

At a meeting held on March 21, Mr. A. D. Michael, President, in the chair, Mr. C. L. Curties exhibited and described a new form of photo-micrographic camera and drawing apparatus, designed by Professor Edinger and constructed by Herr E. Leitz. Dr. W. H. Dallinger exhibited and described a new model microscope, by Messrs. Swift. Messrs. Watson and Sons exhibited a new super-stage plate, fitted with two steel springs. They also showed a Ramsden screw micrometer and an Abbe camera lucida, both made in aluminium. Mr. R. T. Lewis described a scale insect from Natal, which he believed to be *Troza pellucida*. Mr. G. J. Grenfell exhibited and described specimens of Dicyemida, parasites found on the renal organs of Cephalopods.

The President then read a paper entitled "Notes on the Uropodinæ," a sub-family of the Gamasidæ, one of the higher families of Acari. The classification was first considered, that by former authors was reviewed, and a new classification proposed, suitable to the present state of knowledge on the subject. Two new genera were established, one, *Glyphopsis*, for species with the body of irregular form, sculptured on the dorsal surface, and with excavations for the legs on the ventral surface, which the author claimed as forming a natural group; the other, *Trachetes*, to replace *Celæus*, which name has failed by the operation of the law of priorities, and for other reasons. Three new species were described, two from Cornwall and one from the Tyrol; one of the former, *Glyphopsis bostocki*, is the largest and handsomest of known Uropodinæ; the Tyrolese species, *Uropoda hamulifera*, is also a remarkable creature. A list of the British species, which has not been attempted before, was then given, and the synonymy, which has fallen into great confusion, elucidated. The author then treated of the anatomy of *Glyphopsis formicaria*, a curious species found some years since by Sir John Lubbock in the nests of the ant, *Lasius flavus*, and lately found by Mr. Michael in considerable numbers in Cornwall in similar nests. This anatomy varies a good deal from that of other Uropodinæ previously investigated. The alimentary canal is more of the type of other Gamasidæ than of the Uropodinæ, the ventriculus being small and its cœca long. The male genital organs also present special features, but the most remarkable novelties consist in a number of branched "racemose glands" of various sizes underlying the dorsal cuticle in fixed situations, and probably functioning as dermal glands. The coxal gland, which is attached to the second leg on each side, is also noticeable specially for the extremely large size and fleshy nature of its duct. It is probably the most striking coxal gland yet found in the Acarina.

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## Provincial Transactions.

### THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

The quarterly meeting of this Association was held at the Foresters' Hall, Plymouth, on Wednesday, April 4, Mr. J. G. Netting, President, in the chair. After the usual preliminary business, Mr. Freeman W. Hunt was called upon to introduce a discussion on the proposed scheme of territorial representation, and to make some remarks on the proposal for the federation of local associations. Mr. Hunt briefly described the scheme, and enlarged upon the benefits to be gained by it. He urged that it would at least arouse a great amount of interest and ultimately develop into general good. He especially regretted the want of energy and lack of enthusiasm indicated in the action of the majority of chemists towards the Pharmaceutical Society. He asked how many of those who abused the official organ ever tried to make that publication of more service either by their contributions as correspondents on trade matters or by original papers. The complaint that the Society was not deserving of support because it was not more of a trade society, he said, might be met by the question, Where was the old trade association of years ago, the subscription to which was only 5*s.*? It was a trade society pure and simple, and was allowed to disappear for want of support. Those who were discontented should join the Society, get elected as councillors, put the house in order if necessary, and hand their names down to posterity as reformers. Those who remained outside the Society were entirely to blame, since their abstention suffered the present state to exist. So little interest also was shown in the voting for the election of Council, that usually only about one half of the papers sent were returned duly filled up. Whether territorial representation was the best way of arousing enthusiasm or not might be a debatable point, but it could do no harm, and probably might do good.

Amongst the advantages to be gained were:—1. Increased interest in trade matters by individuals, which must produce ultimate benefit in the development of good feeling, as well as friendly and mutual desire to be abreast of one's neighbours both in knowledge and method of conducting business. 2. Power to bring about reforms, if needed, by Act of Parliament or otherwise. 3. Means of bringing before the trade generally anything of interest thereto. 4. Strengthening the Pharmaceutical Society, by stimulating the Council to further action, and thereby inducing those at present outside its membership to join. 5. Formation of a strong means of defence in case of unjust prosecution, and for the removal of grievances, if any, on the part of governmental departments, such as Excise, Inland Revenue, etc.

Mr. Roper, who was unavoidably absent, had written saying he thought the difficulty in territorial representation would be in finding suitable candidates locally, also that the provincial members would be at a disadvantage as regards attendance at committees, when it might possibly be left to a limited few. He also pointed out that a great number of the present Council were country bred, and that the extra expense of a larger number of country members would be a disadvantage.

Mr. Kendle strongly urged that proportional representation be adopted in forming the various districts.

Mr. Cocks supported the idea of territorial representation on condition that it was not necessary to choose the candidates locally.

Mr. Kelley thought there would be no difficulty in finding a local candidate.

Mr. Netting thought local associations ought to have more direct control over infringements of the Pharmacy Acts.

Mr. Park suggested that any infringements of the Pharmacy Acts should be discussed *in camera*, when the Secretary should write pointing out the same to the local secretary of the Society, who should at once take action.

Messrs. Bailey and Breeze also spoke in support of the proposals.

Mr. Hunt in reply said he thought the increased expense caused by the attendance of country members at committee meetings would be made up in subscriptions by new members and associates joining the Society. He took exception to proportional representation, as thinly populated counties would thus compare unfavourably with London. In conclusion, he considered it unfair that so many chemists remained outside the Society.

A unanimous vote of thanks was afterwards passed to Mr. Hunt.

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A meeting of the assistants' section was held at the Foresters' Hall, Octagon, Plymouth, on Thursday, April 12, Mr. C. Wood being elected Chairman. A letter was received from Mr. Green, tendering his resignation as Chairman, which was accepted, and it was decided to elect a temporary chairman at each meeting. It was resolved that all members of the Association should be eligible to attend ordinary meetings of the assistants' section. Mr. H. O. Westcott was elected Hon. Secretary in place of Mr. Hodge, resigned. Mr. N. H. Austin read an interesting paper on the "Destructive Distillation of Coal," at the close of which a hearty vote of thanks was proposed to the author by Mr. C. Wood, seconded by Mr. Fisher.

## LIVERPOOL CHEMISTS' ASSOCIATION.

A meeting was held at the Royal Institution on Thursday, April 5, Mr. J. J. Smith, President, in the chair.

A paper was read on "Pharmaceutical Organisation" by Dr. C. Symes, who briefly described the aims of those who advocate the federation of local pharmaceutical associations.

Mr. J. Smith, in proposing a vote of thanks to Dr. Symes, said he thought it should be the business of some organisation to wait upon each successful candidate at the qualifying examination and put before him the folly and danger of assisting, by taking service with stores, etc., to maintain a system which is seriously hampering the business they hope to make their living by later on, and all for the sake of a temporary advantage, of a little more leisure and possibly a little higher salary.

Mr. R. C. Cowley thought it was hopeless by any such means as suggested to induce assistants not to take engagements with stores. The only hope was in chemists themselves making their assistants more comfortable. In Liverpool he believed there was not much ground for complaint, but in many parts of the country a change in this respect was desirable. He concluded by seconding the vote of thanks to Dr. Symes.

Mr. R. Parkinson expressed his confidence in the Pharmaceutical Society, which was doing valuable work. Those chemists who had kept aloof from the Society made a very serious mistake.

Some "Dispensing Notes" were then contributed by Mr. T. S. Wokes, who also sent for exhibition a new patent suppository mould.

## SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

At a meeting held in the Society's Rooms, on Wednesday, April 11, Mr. G. T. W. Newsholme, President, in the chair, a paper was read by Mr. G. A. Grierson, entitled "Stray Thoughts on Advertising." In the discussion which followed several members took part.

## LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The last meeting of the session was held on Thursday, April 5, Mr. F. Walker, President, in the chair. The President recommended casein as a valuable emulsifying agent for castor oil for children, and Mr. H. Wyatt, jun., said he had found condensed milk useful for the same purpose.

Mr. H. Wyatt, jun., then read a paper on "Six Months in a Parisian Pharmacy," in which he described a typical suburban French pharmacy between Paris and St. Germain.

The paper was read with many touches of humour and pleasant anecdotes of the customs of the people, but Mr. Wyatt did not think that the French assistant was in better circumstances than his British cousin, and in many cases was in much worse.

A smoking concert was held on Thursday, the 12th inst., in the Falcon Restaurant. Mr. Frank Walker, President, was in the chair, and there were between fifty and sixty present. During an interval in the musical programme, the President made a few remarks on the good work accomplished by the Benevolent Fund, and said that on the initiation of Mr. R. C. Cowley it had been decided to give the gentlemen present an opportunity of contributing to the Fund. Mr. R. H. Mitchell supported the appeal, and a collection was taken, the amount realised being £1 6*s.* 9*d.* Songs, grave and gay, were rendered with much acceptance by Messrs. Oxford, Evans, Jones, Vaughan, Waring, Rycroft, Benson, Simcoe, Arthur, and Martin. A vote of thanks to the singers, proposed by Mr. Jackson and seconded by Mr. Burn, and the singing of "Auld Lang Syne" by the company, brought a very pleasant evening to a close.

### CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

On Thursday, April 5, Dr. B. Anningson, medical officer of health for Cambridge, delivered a lecture on "Epidemic Influences in the Urban and Rural Districts Contrasted," under the auspices of the Cambridge Pharmaceutical Association, at the old Anatomical School, Downing Street. Mr. J. Sturton presided, and he was supported by Messrs. A. Deck, A. S. Campkin, D. Greenwood, and others.

The lecture was illustrated with diagrams, and at its conclusion a hearty vote of thanks was accorded to Dr. Anningson, on the motion of the Chairman, seconded by Mr. Deck. A vote of thanks to the Chairman concluded the proceedings.

## Scottish Transactions.

### EDINBURGH CHEMISTS' ASSISTANTS AND APPRENTICES' ASSOCIATION.

The eighth meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, March 7, at 9.15 p.m. Mr. Alexander J. Dey, President, in the chair.

The minutes of last meeting having been read and approved, the following communications were read:—

### DISPENSING PERCENTAGE PRESCRIPTIONS

BY C. A. MACPHERSON.

Percentage prescriptions may be roughly divided into two classes: (1) those in which *n* parts are added to 100 parts, and (2) those in which *n* parts are contained in 100 parts. The following are examples of the first class:—

(1)

℞ Emp. plumbi
Paraffin. moll. āā ℥j ....................=960 grs.
Acid salicylic 2 per cent. ..... ......=19·2 grs.

(2)

℞ Magnes. carb. pond. ℥j..................=480 grs.
Cretæ præparat. ℥j. ....................=480 grs.
Thymol 1 per cent...................... ...=9·6 grs.
Acid. carbolic 1 per cent....... .........=9·6 grs.
Fiat. pulv.

In dispensing this, the thymol should be mixed with the carbonate of magnesia, and the carbolic acid with the chalk, and then all mixed together thoroughly.

(3)

℞ Camphor
Chloral āā ʒj...................................=120 grs.
Veratriæ 1 per cent. ......................= 1·2 grs.

In the foregoing examples the apothecaries' ounce and drachm are indicated, and the percentages are accordingly calculated upon their values, but in the following the basis of calculation is different, the imperial ounce being used:—

(4)

Cret. præcip. 1 oz. ................ = 437·5 grs.
Camphor 10 per cent. ......... = 43·75 grs.

So far no difficulty has occurred, but when a prescription like the next one is presented, a doubt arises as to how the percentage is to be calculated:—

(5)

℞ Mucilag. amyli ℥iv. = 1920 minims or 1750 gr. meas.
adde
Tinct. opii 2 per cent. = 38·4 minims.
Plumbi acet. 1 per cent. = 17·5 grains.

Where there is no special knowledge of the prescriber's intention, and in the absence of any generally understood rule, the better plan appears to be to follow pharmacopœial precedent, weigh solids, measure liquids, and calculate parts by weight in like parts by measure.

The first example of the second class is a logically true percentage preparation, and presents no difficulty.

(6)

℞ Acid. salicylic ......................... 2 per cent.
Resorcin ............................. 5 ,, ,,
Adipis ........ ........... ............ ad ℥j.

Here the proportions are 2, 5, and 93, equivalent to 9·6, 24, and 446·4 grains respectively in the ounce of 480 grains.

In the next set of examples, which contain solids and liquids combined, the same difficulty presents itself as in the last example of the first class, and for several reasons it is expedient to follow the procedure indicated.

(7)

℞ Sol. hydrarg. bichlor. 1 in 500... ℥vi.

(437·5 × 6) ÷ 500 = 5·25, the number of grains of hydrarg. bichlor. required.

(8)

℞ Menthol ............................. 2 per cent.
Ol. eucalypti ........................ ʒj.
Sp. vini rect. ........................ ad. ℥iss.

As 1½ fl. oz. equal 656·25 grain measures, the quantity of menthol is 13·125 grs.

(9)

℞ Glycerin acid boric. 12 per cent.......... ℥ii.

$875 \times \frac{12}{100} = 105$ grs. boric acid.

(10)

Make ℥j. application tannic acid and glycerin 10 per cent.

$437{\cdot}5 \times \frac{10}{100} = 43{\cdot}75$ grs. tannic acid.

(11)

℞ Ammon. chlor.................................. q.s.
Aq............................................... ℥ii.

Sig.—A teaspoonful added to half a pint of water = 1 in 800.

Here we have first to ascertain the quantity of ammon. chlor. in a teaspoonful of the solution, and from that the amount required for the two ounces. (437·5 × 10) ÷ 800 = 5·46875, the number of grains of ammon. chlor. in the teaspoonful, which multiplied by 16, gives 87·5 grs. as the total amount required.

In making carbolic acid preparations, the difficulty arises in using crystallised acid as to whether it should be weighed or melted and measured. The better way seems to be to weigh it and make up to the required measure with the required solvent. The resulting product will be practically identical in strength with one made from the official liquefied acid by measure.

(12)

Make two ounces of a 10 per cent. sol. carbolic acid in equal parts of water and glycerin. This can be made by using 87·5 grains of crystallised or 96 minims of liquefied acid, and making up to two fluid ounces with a mixture of equal volumes of water and glycerin. In like manner the following may be dispensed :—

(13)

℞ Lot. carbolic 1 in 40 ...............mitte ℥vi.
(437·5 × 6) ÷ 40 = 65·625 grs. crystallised acid.
(480 × 6) ÷ 40 = 72 min. liquefied acid.

But crystallised acid alone should be used for the next one.

(14)

℞ Ol. carbolic ..................℥iii. 10 per cent.

For this 131·25 grs. of acid are required, together with sufficient oil to make up the measure of three fluid ounces.

Another way of ordering the class of preparations now being considered is to prescribe a definite weight of solid in a definite volume of liquid.

(15)

Make ʒj. sol. atrop. $\frac{1}{50}$ gr. in every 10 mins.

(16)

℞ Sol. atrop. sulph. et. morph. acet. ......ʒiv.
$\frac{1}{50}$ gr. $\frac{1}{10}$ gr. in 5 mins.

This is the preferable way, and one where there can be no doubt as to what is meant. As much cannot be said for the following, where, owing to the quantities ordered and the purposes for which they may be required, the doubt may arise whether the percentages should be calculated on grain measures or minims.

(17)

Hab. Sol. atropin. sulph. ½ per cent..........ʒii.

(18)

℞ Sol. morph. acet. 4 per cent................ʒiv.

(19)

Make ʒj sol. cocain hydrochlor. 7½ per cent.

The safer way would seem to be to make these according to the general rule already referred to, and calculate on grain measures, unless the prescription bears internal evidence that the prescriber intends a definite amount of active ingredient to be administered, as by hypodermic injection, then the percentage should be calculated on minims.

In the following it is difficult to make out what the prescriber's intention is :—

(20)

℞ Acid boric ........................ gr. 40.
Glycerin............................ ℥vi.
Acid. salicyl ...................... ½ per cent.

The simplest way seems to be to measure the glycerin, and, on the combined weight of it and the boric acid, calculate the required amount of salicylic acid.

In view of the importance of this subject to dispensers and students, as well as to the public, it would be well if some general rule for dispensing percentage prescriptions could be agreed upon so as to ensure uniformity, but better still it would be if practitioners in prescribing were to take care to leave nothing indefinite.

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In the discussion on this paper there was a general concensus of opinion that the difficulty in correctly dispensing such prescriptions arose chiefly in the case of solutions. There was a general agreement that in all probability the prescriber intended the solution to contain a given number of grains by weight in 100 minims. This was indicated by the fact that occasionally prescriptions directed, say, one-fiftieth of a grain of atropine sulphate in 10 minims of water, and also by the fact that hypodermic syringes are graduated in minims.

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The next communication was on—

### THE STORAGE OF DRUGS AND CHEMICALS.

BY CLAUDE F. HENRY.

In this note the author drew attention to the practice of adding new stock to old in hand bottles, stock pots, etc. He specially referred to waters, concentrated infusions, ointments, fixed and essential oils, pills, extracts, and vegetable and metallic powders, pointing out the liability of each class to decompose and in some cases to become inert, and in others to develop poisonous properties, if allowed to lie too long in stock. Having pointed out the inadvisability of mixing new and old stock, he concluded by emphasising the duty of pharmacists, who, possessing more knowledge of the nature, characteristics, and properties of the substances in which they dealt than any other trade, should be most careful to keep these in a state of strength and purity as near perfection as possible.

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The next communication was a—

### NOTE ON THE ALKALOIDAL DETERMINATION OF FLUID EXTRACT OF CINCHONA.

BY WILLIAM DUNCAN.

In the determination of this galenical preparation the solvent is apt to form an emulsion with the alkaline liquor, and the two liquids separate slowly and imperfectly. This may be avoided to some extent if a rapid rotatory motion rather than violent agitation is adopted. Even in experienced hands, however, and particularly with some samples of extract, emulsification frequently takes place and causes delay. This undesirable condition may be greatly minimised by modifying the official process as follows :—

Take 100 fluid grains of the extract and dilute with distilled water to 1 fluid ounce. Filter off half a fluid ounce (equal to 50 fluid grains) and transfer to a separator. Then proceed as the Pharmacopœia directs. Extract of cinchona being acid, there is no danger, so far as I have been able to find, of alkaloid being precipitated with the resins and colouring matter. To avoid any such danger, however, the extract may be further acidulated by the addition of a few drops of dilute hydrochloric acid. By means of two separators the author showed the relative rapidity and completeness with which the solvent separated in the case of the filtered extract.

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The next communication was on—

### THE VOLUMETRIC DETERMINATION OF FERRIC SALTS.

BY WILLIAM DUNCAN.

The author stated that in a discussion on the determination of ferric salts which took place in the Association several years ago, he had suggested that this might be done by determining the amount of iodine liberated from potassium iodide, when brought in contact with the salt, by means of sodium thiosulphate. This method had been adopted for all ferric salts in the new United States Pharmacopœia, and it was more expeditious and quite as accurate as the gravimetric method. The solution of the ferric salt is acidulated with hydrochloric acid, excess of potassium iodide added, and the mixture kept for half an hour at 40° C. It is then cooled and titrated with $\frac{N}{10}$ solution of sodium thiosulphate, starch mucilage being used as indicator. The author then gave a demonstration of the method, using solution of ferric chloride containing 20 per cent. of iron. The result calculated out gave 20·08 per cent.

The next communication consisted of—

### Dispensing Notes.

BY WILLIAM DUNCAN.

*Iron Salts and Pimenta.*—The following mixture invariably deepens in colour, finally becoming black:—

| | | |
|---|---|---|
| ℞ | Tinct. ferri. perchlor. | ʒii. |
| | Quin. sulph. | grs. xviii. |
| | Sp. chloroformi | ʒi. |
| | Aq. pimentæ | ad. ℥vi. |
| M. | | |

On adding the iron to the pimenta water the mixture assumes a greenish-blue tint, quickly deepening to yellowish-brown, and finally depositing a black insoluble precipitate. This result is a characteristic reaction of all phenols, and is due to the reaction betweet the ferric chloride and the eugenol of the oil of pimenta.

*Aqua pimentæ.*—It may here be pointed out that the Pharmacopœia is not explicit enough in its directions for the preparation of the aromatic waters. More oil distils over than the water can hold in solution, and especially is this the case with the water in question. Of course, it occurs to anyone to let the water stand till the oil separates, but it is advisable to give more explicit directions when we are expected to adhere closely to the Pharmacopœia.

*Nitrate of Silver and Cocaine.*—The following prescription has been handed to me for information as to how it should be dispensed.

| | | |
|---|---|---|
| ℞ | Argent. nitrat. | grs. x. |
| | Cocainæ | grs. xii. |
| | Aquam ad. | ℥i. |

Sig.: The lotion for the throat.

The prescriber is evidently alive to the incompatibility of the alkaloidal hydrochlorate with silver nitrate, and therefore orders the alkaloid. It is only sparingly soluble, but nevertheless sufficiently so to reduce the silver salt. If the alkaloid be carefully neutralised with nitric acid before adding the silver nitrate, a perfectly clear and stable solution results.

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The reading of the papers was followed by discussion, taken part in by Messrs. Coull, Cowie, Dey, Duncan, Henry, Hill, Lothian, Macpherson, and White, and on the motion of the chairman a cordial vote of thanks was awarded to the authors, and especially to Mr. Duncan, who had charge of the arrangements.

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The annual supper took place in the Imperial Hotel, Market Street, on Friday, April 6, when upwards of fifty were present. Mr. Alexander J. Dey, President, occupied the chair, and was supported by Messrs. J. Nesbit, chairman of the Board of Examiners for Scotland, and Mr. P. Boa, Vice-Chairman of the Edinburgh District Chemists' Trade Association.

The loyal toast having been duly honoured, Mr. J. Lothian proposed "The Pharmaceutical Society and the Board of Examiners," which was acknowledged by Mr. Nesbit. Mr. Rutherford Hill proposed "The Edinburgh District Chemists' Trade Association," which was acknowledged by Mr. Boa. Mr. W. Duncan proposed "The Edinburgh Chemists' Assistants' and Apprentices' Association," which was acknowledged by the Chairman. Mr. A. Russell Bennet, of Newcastle, proposed "The Edinburgh Pharmacy Athletic Club," which was acknowledged by the President, Mr. W. D. Jameson. Mr. G. Hogg proposed "The Ladies," which was acknowledged by Mr. G. Coull. The evening's proceedings were diversified by a pianoforte selection by Mr. T. Jardine, a banjo solo by Mr. J. M. Cameron, a violin solo by Mr. Dundas, a recitation by Mr. W. D. Jameson, and songs by Messrs. W. Duncan, G. Hogg, A. Murray, Forrest, Anderson, and J. C. Gibb. Mr. James Crichton acted as accompanist.

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### EDINBURGH PHARMACY ATHLETIC CLUB.

The annual general meeting was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, 11th inst., at 9.15 p.m. Mr. W. D. Jameson, President, in the chair.

The reports of the Secretary and Treasurer were read, from which it appeared that the club was in a satisfactory position, the membership being ninety-two. The expenditure was over £100, but there was still a substantial cash balance in hand. The office bearers for next session were elected as follows:—Honorary President, Mr. George D. Mackay; President, Mr. W. D. Jameson; Vice-President, Mr. W. B. Cowie; Secretary, Mr. J. P. Gibb, 8, Buccleuch Place; Assistant Secretary, Mr. J. Hogg; Treasurer, Mr. A. S. Birnie, 66, Brunswick Street; and as members of Committee, Messrs. G. F. Anderson, J. Brown, J. McBain, D. Mackenzie, D. S. Murray, A. Nicolson, and W. A. Purdie.

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# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Judgment in the Leeds Chlorodyne Case.

At the Leeds Town Hall, on Wednesday, Mr. Bruce, the stipendiary magistrate for the city, delivered his decision in the case of Smith *v.* Catterall, which was heard before him a week previously. The complainant was William Smith, of 23, Ashville Terrace, Headingley, who brought the action on behalf of the Grocery Vendors' Association. The defendant was Cuthbert George Catterall, chemist, Hyde Park Corner. The summons charged Mr. Catterall with having, on February 23, sold to the complainant, without asking any questions or making any entry in a book kept for the purpose, a preparation known as "Dr. Collis Browne's Chlorodyne," which, it was alleged, contained prussic acid. At the hearing on the previous Wednesday, the sale of the compound was admitted.

Mr. Dunn (solicitor), who appeared in support of the summons, said that the complainant went to the shop of Mr. Catterall and purchased a bottle of the chlorodyne. No questions whatever were asked of him. The contents of the bottle were submitted to the analysis of Mr. Rawson, analytical chemist, Bradford, who found that it contained prussic acid. Mr. Rawson would tell his worship that the compound, taken as a whole, was poisonous, but that the prussic acid was not present in sufficient quantity to cause death.

Mr. Arthur Willey (solicitor), who defended, took a preliminary objection, and contended that as his client was summoned only for having sold prussic acid, the prosecution was confined to that drug.

Mr. Dunn argued that the compound chlorodyne was poisonous.

The case was allowed to proceed, and Mr. Dunn called

Mr. Rawson, who said that he was a Fellow of the Institute of Chemistry. He had made a partial analysis of the chlorodyne, and had found in it ·005 per cent. of pure prussic acid, or 1·2 grain of commercial prussic acid. In cross-examination the witness said that pure prussic acid was not a commercial article. There was not sufficient prussic acid in the compound to kill a person if taken by itself, and there was not more than an allowable dose.

The Stipendiary: What I understand you to say is that the whole bottle, if taken together, would kill a person. Supposing the prussic acid were separated from the rest, was there sufficient to kill a person?

Witness: No.

The Stipendiary: Was there more than a medicinal dose?

Witness: No.

Mr. Willey thereupon contended that there was no case, inasmuch as his client was only charged with selling prussic acid contained in the chlorodyne.

The Stipendiary: Mr. Rawson says that there is prussic acid in the compound. Supposing a person went to a number of shops and purchased several bottles, he would get sufficient prussic acid to poison himself.

Mr. Willey: But the amount he would get in a single bottle would be insufficient. I submit that if there is not sufficient in this bottle we are not liable. I shall call gentlemen to prove that there is no trace of prussic acid in the compound.

Mr. Rawson (recalled) said that there were also morphine and chloroform in the mixture. He had no doubt that there was a distinct trace of prussic acid present in it.

Mr. Willey called for the defence Mr. Horace Davenport, chemist, London, who said that he and his father had been the sole makers of the chlorodyne. There was no such thing as prussic acid put into it. In cross-examination witness declined to say what the chlorodyne was composed of, as that was a trade secret. No articles were put in which contained prussic acid. Prussic acid was not present in the compound, because it had not been put in.

Mr. Arthur Edward Coverdale, assistant to the defendant, spoke to having supplied a bottle of the chlorodyne to Mr. William McDonald McKay, analytical chemist, Leeds.

Mr. McKay said that he had analysed the contents of the bottle, and had subjected it to tests to ascertain if it contained prussic acid.

Mr. Willey: Were you able to find any prussic acid in it?

Mr. Dunn objected to the question, as the witness had not analysed the particular bottle in dispute.

Mr. Willey: We have had no opportunity of analysing that bottle.

Mr. Dunn: It is hardly fair to say that. When this bottle was purchased, the person said that it would be analysed. They might have taken part of it for analysis if they had asked for it.

Mr. Willey having quoted several cases bearing on the subject, the Stipendiary said that as the case was one of considerable importance to the public, he would reserve his decision for a week.

### THE DECISION.

Mr. Bruce, in delivering judgment, said: This was a case in which, according to the summons taken out by William Smith, Cuthbert George Catterall was charged that he did on February 23, 1894, sell and deliver to the said William Smith a certain poison, to wit, prussic acid, in a preparation called "Browne's Chlorodyne," the same being named in the first part of schedule A of the Pharmacy Act, 1868, and unlawfully did not then, and before delivering the said poison to the said William Smith, make or cause to be made, as required by the said Act, an entry in a book to be kept for that purpose, stated in the form set forth in schedule F of the same Act, the date of the said sale, the name and address of the said William Smith, the name and quantity of the said poison aforesaid, and the purpose for which it was stated by the said William Smith to be required, nor cause to be affixed the signature of the said William Smith to the said entry required to be made as aforesaid, contrary to the form of the Statute made and provided." The sale of the chlorodyne was admitted, as was also the non-entry, and the only question was whether the article sold contained poison within the meaning of the first part of schedule A of the Pharmacy Act, under which the summons was brought. The article sold is a compound called "Dr. Collis Browne's Chlorodyne," and it is alleged that it contained prussic acid. An analytical chemist (Mr. Rawson) was called by the prosecution, and he stated that he had analysed the contents of the bottle sold, and had found that it contained prussic acid, but the amount was very small, being, I believe, only ·005 of a hundred parts. He also said that the contents of one bottle, if taken as a whole, would be fatal to the person taking it, but that the prussic acid contained in the bottle would not be sufficient to destroy life. He said that there were two other poisons in the compound—opium and chloroform—but neither of these comes under the first part of Schedule A. On the part of the defendant there was called the manufacturer of Dr. Browne's chlorodyne, who stated that no prussic acid was used in the preparation. It was stated that another bottle of the mixture, forming part of the same bulk, had been analysed for the defendant, but the result of that analysis was objected to, and was not admitted. Upon the whole of the evidence I entertain so much doubt as to whether there was any prussic acid in the compound that I do not think I can safely proceed to a conviction. The matter places a great doubt in my mind. I am of opinion that the prosecution should have had several bottles analysed instead of one, and should have called more than one witness to prove the presence of the poison. I see no reason why I should doubt the evidence of the manufacturer, and the prosecution did not call anyone to show that prussic acid had been put into the compound immediately before its sale. If I had held that there had been poison in the chlorodyne, some points of law might have been raised, and the cases that were quoted at the trial might have been useful. I have decided to dismiss the summons.

Mr. Willey: I have to ask, on behalf of the defendant, for costs in this case. The defendant has been put to considerable expense in the matter.

Mr. Bruce: I think it is only right that you should have your costs.

Mr. Willey: I ask for the costs of the witnesses I have called, except those of the gentleman whose evidence was objected to. I ask for the costs of Mr. Davenport.

Mr. Bruce: I consider Mr. Davenport was a necessary witness. I should be inclined to allow him his travelling expenses.

Mr. Willey: That is all I ask for. Mr. Catterall was really the defendant.

Mr. Bruce: Yes, that is so; but Mr. Catterall had to defend himself by calling Mr. Davenport.

Mr. Willey: Will your worship allow the advocate's fee?

Mr. Bruce: Yes.

## PROCEEDINGS IN THE COURT OF CHANCERY.

### IN RE KAY'S PATENT, NO. 16,496 OF 1892.

In the Court of Chancery, on Saturday, April 14, the petition of the Pharmaceutical Society of Great Britain for the revocation of Letters Patent, No. 16,496 of 1892, for a medicinal preparation called "Klorodine," was heard by Mr. Justice Stirling. Mr. R. Wallace appeared for the petitioner, and Mr. Lawson for the respondents.

Mr. R. Wallace: My lord, this is a petition for the revocation of Letters Patent granted to Thomas Kay, George Arthur Shaw, and Kay Brothers, Limited. My friend, Mr. Lawson, appears for one of the respondents.

Mr. Lawson: For two of them.

Mr. Wallace: I appear for the Pharmaceutical Society of Great Britain, and my friend, Mr. Lawson, takes a preliminary objection that one of the respondents has not been served. That respondent is in South Africa. Of course, as an opposed petition, it will have to go into the witness list in the ordinary course.

Mr. Justice Stirling: You have not served one of the respondents.

Mr. Wallace: I do not know, my lord, whether it is necessary in a case of this kind that all the patentees should be served.

Mr. Justice Stirling: Who is the respondent who is not served?

Mr. Wallace: If your lordship will look at the letters patent No. 16,496 of 1892, you will see that the specification is signed by Thomas Kay, George Arthur Shaw, and George A. Downes, secretary for Kay Brothers, Limited. Now, it appears, my lord, that there are plenty of gentlemen, and my friend represents two of the patentees, to defend the interests of this patent, and it appears from the correspondence that this other gentleman is expected back in England, and they have communicated with him by telegraph, and that he will most likely be here before the hearing. We are quite ready to let it stand on one side with liberty to apply if he should not be here when it comes into the witness list. I think that will meet all objections.

Mr. Lawson: My lord, I think that will meet the case. I submit to your lordship that there is a great technical difficulty in proceeding to the revocation of a patent when the petition is only served on two patentees out of three. What I should have asked your lordship to do if it had been ready to go on would be to allow the case to go into the witness list in the usual way, because a case of this kind cannot be tried on affidavits. The course my friend proposes is practically the same thing, to let it go into the witness list, and to let nothing be done with it until they have served Mr. Kay by making a fresh application to your lordship.

Mr. Wallace: No; I suggested it should go into the witness list, and if Mr. Kay was not here at the time it came on, that then there should be liberty to apply to postpone the hearing until he did come.

Mr. Justice Stirling: You are in communication with Mr. Kay, I understand?

Mr. Lawson: I have not seen the correspondence, but from what my friend says, it appears that we are.

Mr. Wallace: I have read the letter.

Mr. Lawson: I am told we have not heard definitely. No doubt there is some connection between Kay and Kay Brothers' business, but I am only instructed on behalf of George Arthur Shaw and Kay Brothers. I will take any course your lordship thinks right. I only ask that it should be tried in the end *vivâ voce*.

Mr. Justice Stirling: I am afraid there is no power at the present time to serve notice of a petition out of the jurisdiction.

Mr. Wallace: The new rules give power to serve a notice of motion under the Trademarks, Patents, and Designs Act.

Mr. Justice Stirling: That has been revoked.

Mr. Wallace: Yes. I beg you lordship's pardon.

Mr. Lawson: Your lordship remembers there is a case in the Court of Appeal, which follows a decision of your lordship—the case of Neil and Co. The Registrar of Trademarks directed notice to be given to the absent party.

Mr. Justice Stirling: That I could do. Seeing that there is no statutory provision for service out of the jurisdiction of a petition of this kind, and no rule, all I could do would be to follow the same course which was adopted in reference to the service of a trademark matter.

Mr. Wallace: Yes, my lord, there was the case of the *Société Anonyme de Verreries d'etoile*. But as he is coming back to England it would be useless expense to follow him to South Africa.

Mr. Justice Stirling: If he is coming back in a reasonable time.

Mr. Lawson: I am told he is coming back in a month.

Mr. Wallace: They expected him to be back in time for the hearing to-day.

Mr. Justice Stirling: I will put it in the witness list, Mr. Lawson, with liberty to apply, saying at the same time that unless he comes to this country and is formally served, or appears by Mr. Lawson, or unless you get an order giving him notice that the proceedings will be brought on on a certain day, and in the same way as notice is given with reference to proceedings under the Trademarks Act in accordance with the case Mr. Lawson has mentioned, the petition cannot be heard.

Mr. Wallace: I think that will meet the case.

### IN RE RENDELL'S PATENT, NO. 13,922 OF 1892.

On the same day a similar petition was heard by Mr. Justice Stirling, with reference to Letters Patent, No. 13,922 of 1892, for a medicinal preparation containing laudanum, Mr. R. Wallace appearing for the petitioner, and Mr. W. Taylor for the respondent.

Mr. Wallace: My lord, this is a similar case, in which the Pharmaceutical Society is also the petitioner. I do not know whether your lordship has had one of these cases before; if not, I will tell your lordship the circumstances under which these petitions are presented. The Pharmaceutical Society is a society incorporated by charter in 1843, and it regulates the affairs of chemists and druggists, but also under the Act of 1852, and various other Acts, the Pharmaceutical Society has been entrusted with the care of the public with regard to the sale of poisons. There was a case which was reported in the 'Law Reports,' Vol. I. of Queen's Bench Division, for 1892, page 686, in which it was decided that when patents they did not come within the provisions of that Act, and in consequence a very large number of patents for medicines were taken out. These patents were worthless patents, and they were taken out merely to evade that Act. This is one of them: the ingredients are 2 ozs. of sal volatile, 2 ozs. of peppermint, 2 ozs. of spirits of camphor, and 2 ozs. of laudanum, and the claim is for a combination of ingredients for the treatment and cure of the various and similar complaints as herein set out and described. Well, my lord, the Pharmaceutical Society have felt it their duty to revoke a large number of these patents, and they have had the leave of the Attorney-General to present this petition, and it is before your lordship on particulars of objection to the patent. My friend, Mr. Wright Taylor, is here before your lordship, and I believe he consents to the revocation of the patent.

Mr. W. Taylor: My lord, I appear for the patentee. She is advised that there is not sufficient novelty in her invention to form good subject matter, and she consents to revocation, not at all on the ground that is put to your lordship, that it is a compound containing poison, and so not patentable at all within the decision in Piper case, which, I understand, is my friend's point, but I consent to the revocation of my patent on the ground solely that I do not think I can support it as good subject matter. When your lordship deals with the costs there is one circumstance I think I ought to mention, and that is this—I believe the ordinary practice in these revocation cases is for the law officer to only issue his fiat on notice to the parties concerned, and if that course had been taken, then we should have appeared before the law officer, and we should have consented at once to the revocation of our patent. Now, in this case, the law officer has granted his fiat without notice to us, and for that reason I submit to your lordship I ought not to be saddled with these costs.

Mr. Wallace: The law officer has no power first of all to revoke a patent. According to section 26 of the Patent Act, the revocation of a patent "may be obtained by petition to the court." The law officer having no authority, all we have to do is to get his consent to it. You need not serve the other side unless the law officer wishes it. That is the usual practice. In many cases he requires the other side to appear and be heard, but in all cases he does not do so.

Mr. W. Taylor: My point is that the law officer not having given us the opportunity, as I think my friend will agree is the ordinary practice, of appearing before him when he issued his fiat, your lordship should take that into consideration when dealing with the costs.

Mr. Justice Stirling: I do not see how revocation could be obtained under the Act without presenting a petition.

Mr. W. Taylor: My submission is that we could consent before the law officer, and take our patent off the register.

Mr. Justice Stirling: That is not revocation.

Mr. W. Taylor: Considerable expense is incurred before the law officer. Certain certificates have to be given by the solicitor and counsel.

Mr. Justice Stirling: I do not deal with those. I simply give the costs of the application before me, viz., the costs of the petition.

Mr. Wallace: Of course, we are obliged by the section to apply to the law officer. We are not one of those persons who could present a petition without the leave either of the Attorney-General in England or Ireland, or of the Law Advocate in Scotland.

Mr. Justice Stirling: Quite right.

Mr. Wallace: So that if your lordship would say we should have all the costs necessarily incurred by us in the matter, and leave it to the Taxing Master——

Mr. Justice Stirling: I give you the costs of the petition.

Mr. W. Taylor: Your lordship does not certify the particulars of objections.

Mr. Wallace: My friend says that his patent is bad on the grounds set out in the particulars of objection, or at least on some of them, and there is no finding in the case. It is only the mere costs of the pleadings. You must deliver with your petition particulars of the objection to be attached to the petition—it is part of the petition.

Mr. W. Taylor: It has already been decided that in a revocation case the court cannot grant a certificate under the 26th section.

Mr. Wallace: I do not ask for the certificate, I only ask for the costs.

Mr. Justice Stirling: Very well, it will simply be an order for the revocation of the patent with the costs of the petition.

## RECENT POISONING CASES.

### Suicide by Carbolic Acid.

On April 13, Mr. F. Price, Salford Borough coroner, held an inquest touching the death of Elizabeth Heffron, aged 35, of 3, Beswick Street, Oldfield Road, Salford. Mrs. Heffron was of intemperate habits, and, during the absence of her husband from home, she gave a neighbour's child a penny, and asked her to fetch a pennyworth of carbolic acid from the shop of Mr. Bullock, a neighbouring chemist. She told the child to tell the chemist that the acid was required for poisoning rats. Mr. Bullock would not serve the girl, but she obtained the poison from another place in Regent Road, and gave it to Mrs. Heffron, who poured the liquid out of the bottle into a basin and drank it. The woman at once became insensible, and Dr. Forsyth was called in, but she died very shortly afterwards. The jury found that the deceased woman committed suicide whilst insane through excessive drinking.—*Manchester Courier.*

### Suicide by Prussic Acid.

On April 11, Mr. Carttar, coroner of south-east London, held an inquest at Greenwich on the body of John Thurgood, aged 45, dispenser at Greenwich Provident Dispensary, Nelson Street. The deceased was a pensioned staff sergeant from the army. Miss Christabel Airy, daughter of the late Astronomer Royal, and honorary secretary of the dispensary, said she left the deceased on Saturday night at the dispensary. He had access to poisons. Evidence was given that the deceased was away from the dispensary all night, and returned at 11.30 on Sunday morning, when he went into the surgery, and subsequently to his bedroom, where he was found lying on the bed, dead, about half an hour later. Dr. Jarvis stated that he found that death was due to prussic acid poisoning. The jury returned a verdict of "Suicide whilst labouring under temporary insanity."—*Morning Advertiser.*

### Suicide by Opium Poisoning.

The Bradford Borough coroner, Mr. J. G. Hutchinson, held an inquiry at the Town Hall, on April 13, as to the circumstances of the death of Joseph Dodgson, aged 50, a shoemaker, of 158, Westgate, who had, it was believed, taken poison on Thursday, and who died at the Bradford Infirmary yesterday morning. Dr. Wood, house surgeon at the Infirmary, stated that he thought Dodgson died from the effects of an overdose of opium. The jury returned a verdict that the deceased had committed suicide whilst temporarily insane.—*Bradford Observer.*

### Cases of Poisoning by Arsenic.

On April 13, at Glossop, Mr. Davies resumed the inquiry into the cause of the death of Tom Fox, of Wood Street, and Henry Battersby, of Duke Street, Glossop, who met their deaths from arsenic poisoning whilst following their employment in the chemical department of the Dover Paper Mills, Glossop, belonging to Captain Partington. It appeared the deceased had been engaged in boiling hydrochloric acid for the manufacture of tinfoil paper, and had died from inhaling arsenic fumes. Enoch Goldthorp and Wright Anelay, two other workmen who had been ill from the same cause, gave evidence as to assisting the boiling of the acid and tin. The jury found that the men died from the effects of arsenic poisoning, caused by inhaling the fumes of the acid, which contained an excessive quantity of arsenic, which ought not to have been sent out by the Alkali Company in that condition. They further recommended that in future each mug should be filled separately and covered before another was filled, and that the men engaged in boiling acid be provided with respirators.—*Sheffield Independent.*

### Deaths from Overdoses of Chlorodyne.

The circumstances attending the death of Alexander Thos. Kelsey, aged 44, a leading stoker of H.M.S. Marlborough, were investigated at the Portsmouth Town Hall, on April 13, by the coroner, Mr. S. A. Bramsdon, J.P., and a jury. Deceased was found insensible, and after Dr. Maybury had tried for two hours to restore consciousness the patient was removed to the hospital, where he died the same afternoon. An empty chlorodyne bottle was found under deceased's bed, and his relatives knew that he took the drug to alleviate pains in the region of the heart. Death was attributed to cardiac syncope, produced by an overdose of chlorodyne taken to induce sleep.—*Western Mercury.*

Mr. F. Price, the County coroner, held an inquest at Taunton, near Ashton-under-Lyne, on April 14, relative to the death of Emily Baron, aged 34, wife of a licensed victualler at Marple. On Wednesday last the deceased visited her mother at 98, Oldham Road, Taunton, and was pressed to stay all night instead of returning home. She produced a bottle containing chlorodyne, and said she would not sleep if she did not take a drop. The deceased afterwards went to her bedroom, and on the following morning she was found unconscious. Dr. Pearce was brought, and was handed a bottle which was found in the bedroom, and which contained chlorodyne. He was unable to restore the deceased to sensibility, and the woman, who exhibited symptoms of opium poisoning, died the same evening from an overdose of the chlorodyne, one ingredient of which is morphine. The jury returned a verdict of "Death from misadventure."—*Manchester Courier.*

### OXIDE OF TIN FOR WHITE PEPPER.

The funeral of Mr. Benjamin Davis, chemist, Warwick Street, Leamington, took place on April 13. Mr. Davis had been ill since Christmas, his ailment originating from his having by mistake taken with his food oxide of tin (putty powder). This powder was kept in the shop near to the canister of white pepper, and unhappily the pepper castor got filled with oxide of tin instead of pepper. The district coroner (Mr. D. R. Wynter) considered it unnecessary to hold an inquest. —*Birmingham Gazette.*

### SUICIDE BY LAUDANUM POISONING.

Mr. J. E. Bush, the Borough coroner, held an inquest on April 17, at 17, Sudeley Street, Brighton, on the body of a lady named Harriett Eliza Chamberlin, lately staying at that address.

Mr. Thomas Chamberlin B. Chamberlin said the deceased was his sister, whom he had not seen previous to her death for several months. She was at times rather eccentric. He knew also that since the marriage of a niece she had been very depressed. But he had never seen anything to make him think she would make an attempt on her life.

Elizabeth North, 17, Sudeley Street, said she heard the deceased moving about till after twelve o'clock on Sunday night. On Monday morning, when she went to call her, she found her on the bed, unusually pale. She asked if she were ill, but received at first no answer, but afterwards deceased said she was not well, and witness called up the last witness, and a doctor was sent for.

Mr. Bruce E. Goff, M.B., said death was due to laudanum poisoning. The deceased had always been eccentric while he knew her.

The jury returned a verdict of "Death from laudanum poisoning, self-administered while temporarily of unsound mind."—*Sussex Daily News.*

### SUICIDE BY PRUSSIC ACID POISONING.

On April 17, Henry Moss, assistant to Mr. J. Taylor, chemist and druggist, of Lucius Street, Torquay, committed suicide by taking poison. Rising at an early hour, he proceeded with his customary duties, assisted the children in lighting the kitchen fire, as Mr. Taylor was temporarily without a servant, and afterwards joined them in a little frolic. Later, one of the children found him lying upon the bed with a strange look upon his face. She called her father, who discovered that his assistant had poisoned himself with prussic acid, and that life was already extinct.—*Torquay Directory.*

### POISONING BY OPIUM.

An inquiry was held on April 18, at the Manchester Coroner's Court, by Mr. Sidney Smelt, deputy coroner, into the circumstances attending the death of Mr. Robert Edie, 29 years of age, a surgeon, who, at the time of his death, was attached to the staff of the Royal Eye Hospital, Oxford Street, Chorlton-on-Medlock. Dr. William Boyle Coghlan deposed that when he saw the deceased he was suffering from the effects of opium poisoning. He was conscious to a certain extent, but when asked if he had taken anything, he declined to answer. The stomach pump was applied, and every effort made to rouse the deceased, but without success, and death resulted about noon. Witness had no doubt that death was due to opium poisoning. Subsequently he found that a morphine bottle had been removed from its proper place in the dispensary and not put back. About half an ounce of the drug had been taken from the bottle. He had known Mr. Edie for some time, and he should say he had not been in the habit of taking opium. He also knew of nothing that might have troubled the deceased. The jury returned a verdict that the deceased died from poisoning by opium, self-administered, there being no evidence to show for what purpose he took it.—*Manchester Evening News*

### POISONING BY PENNYROYAL.

At an inquest held to inquire into the death of Annie Blake, of 30, Woodgate Street, Battersea, who died in St. Thomas's Hospital, it was shown that abortion had been procured, apparently by means of an infusion of pennyroyal. The jury found that death was accelerated by the administration of the herbal infusion, which, in their opinion, was not given with criminal intent. The coroner said the case should act as a warning to herbalists.—*Sun.*

### DEATHS FROM CARBOLIC ACID.

In the House of Commons on Tuesday, Mr. Macdona gave notice that on Friday, April 20, he would ask the Vice-President of the Committee of Council, if he is aware that there have been about fifty deaths arising from carbolic acid since the commencement of the year; and whether he will take steps to lessen the temptation to commit suicide by the use of carbolic acid.

## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

### RAPESEED OIL OR OLIVE OIL.

Edward Baynes,* druggist, of Parliament Street, York, was summoned for selling to a purchaser a drug not of the nature and quality demanded. On March 8 Mr. J. Atkinson, inspector under the Food and Drugs Act, went to the shop of Baynes, Limited, Parliament Street, and there asked defendant for a pound of olive oil, and asked the price. Defendant gave him a price, and witness then asked if he had any cheaper. Defendant said he had some olive oil at 10*d.* a pint, and witness asked for a pint, for which he handed a pitcher to defendant. On receiving the oil, the inspector told Mr. Baynes that he was an inspector under the Food and Drugs Act. He then divided the oil into three parts, giving one to Mr. Baynes, keeping one for himself, and sending the other to the public analyst. The certificate of the analyst showed that the oil sold as olive oil was rapeseed oil. Defendant was fined 20*s*. and costs.—*York City Press*.

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* This name does not appear on the Register of Chemists and Druggists for 1894.

## Obituary.

Notice has been received of the death of the following:—

On March 11, at Bendigo, Australia, James Bunyan L. Mackay, Chemist and Druggist, formerly of Ventnor, I. W. (Aged 38). Deceased was a former student in the School of Pharmacy, and his name appears on the list of prizemen for 1879.

On March 25, Thomas M. Freestone, Pharmaceutical Chemist, of Bristol. (Aged 74). Mr. Freestone joined the Society in 1844.

On March 30, James John Owles, Pharmaceutical Chemist, of Great Yarmouth. (Aged 58).

On April 1, William Graves Blythe, Chemist and Druggist, of Goole. (Aged 39).

On April 7, John Marmaduke Vipond, Chemist and Druggist, of Sunderland. (Aged 55).

On April 8, Francis Albert Lugar, Chemist and Druggist, of Derby. (Aged 54).

On April 9, Benjamin Davis, Chemist and Druggist, of Leamington. (Aged 45). Deceased was an Associate in Business of the Society.

On April 9, William M. Jackson, Chemist and Druggist, of Ayr. Deceased was an Associate in Business of the Society.

On April 10, James Coley, Chemist and Druggist, of Liverpool. (Aged 56). Mr. Coley had been a member of the Society since 1884.

On April 12, John Thomas, Pharmaceutical Chemist, of Cowbridge, Glamorgan. (Aged 72). Mr. Thomas' membership with the Society dates back to 1853.

## Correspondence.

### BRITISH PHARMACEUTICAL CONFERENCE.

Sir,—In the report of the meeting of the Executive of the above, on page 867, there is a slight error, which has been copied in the editorial note on page 860. This I shall be glad if you will allow me to correct. The report mentions "Christ Church College," but this is not a correct description, as Christ Church is not a "college," but a foundation, partly academical and partly cathedral, known as a "House." The sentence referring to this should read: "It is proposed that the reception by the President be held in Christ Church Hall on the evening of Monday, July 30." The magnificence of Christ Church Hall and the historical associations of Christ Church will, I feel sure, be an incentive to all who intend to visit the Conference to reach Oxford in time for this reception. As I am writing, perhaps you will allow me to mention that our friends at Oxford intend to have a committee to take charge of the ladies who accompany the members of the Conference, and to act as their guides to the many delightful and interesting places and things to be seen at Oxford.

N. H. MARTIN,
*President of the British Pharmaceutical Conference.*

*Newcastle-on-Tyne.*

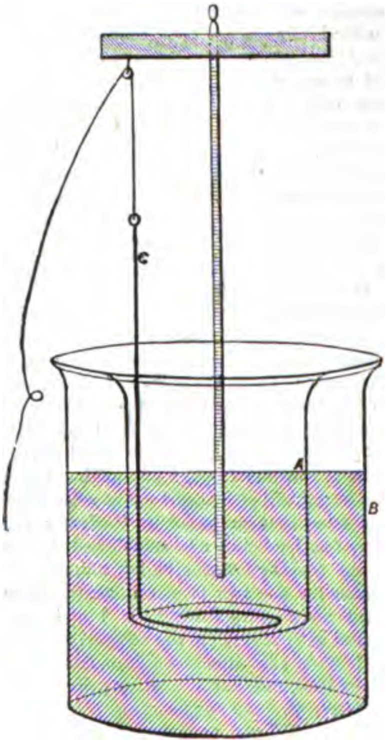
### PURE ACONITINE.

Sir,—In the report of Professor Dunstan's lecture on the alkaloids of *Aconitum napellus*, delivered in March, 1893 (*Pharm. Journ.*, xxiii., 766), the following statement occurs: "It is quite certain that this alkaloid is far purer than any specimen of aconitine which has hitherto been used therapeutically, and Professor Cash tells me that it is certainly the most powerfully toxic specimen he has ever met with." This was somewhat surprising, since the melting point obtained by Professor Dunstan in 1891 (*Pharm. Journ.*, xxii., 75) from his specially prepared sample accorded closely with that previously determined by myself, when, during 1889, several samples of commercial crystalline aconitine were examined by me, for description in the 'Companion,' subsequently issued in March, 1890. It appeared to me at that time that the melting point gave the most ready and reliable test of purity, and three of the samples examined melted at a temperature higher than 350° F. (177° C.), and one sample in large crystals melted at 366° F. (185°·5 C). The whole of the thermometer was not immersed in the paraffin bath, nor was any allowance made for the unheated portion of the mercury column. If the allowance be made, the figure for the large crystals would be 186°·5 C. Feeling tolerably certain that Professor Dunstan's product would be indistinguishable therapeutically from at least one make of aconitine, which had been in commerce for some years before the commencement of Professor Dunstan's investigations, I wrote to Professor Cash on the subject, in June, 1893, and he kindly offered to examine the best sample described in 'Companion,' 1890, a quantity of which I happened to have left over from my experiments. He reported thus:—"As regards toxicity towards frogs, I am unable to separate the solution of aconitine hydrobromide with which you furnish me from that prepared by Professor Dunstan. The identity of action being also established, I have little doubt that the toxicity towards higher animals would be about the same for the two preparations, therefore have not extended the inquiry further." I next opened a correspondence with Merck on the subject, and he stated that he had made crystalline aconitine from *Aconitum napellus* since 1883, and that its melting point was between 190° and 192° C. In explanation of the higher figures obtained, I have received from him a letter, an extract from which is appended, and will no doubt be of interest to your readers. It would also appear that Professor Dunstan has since found reason to raise his melting point; for whereas in 1891 he obtained the figure 188°·5 (corr.), he now (*Pharm. Journ.*, xxiv., 581) gives it as 188°-190° C. It would be interesting to know whether this alteration is due to a different method of taking the melting point, or to a further purification of his product.

418, *Oxford Street, W.* P. W. SQUIRE.

[*Extract from Letter.*]

"A short time ago I determined the melting point of aconitine pure cryst. from *Aconitum napellus*, and found it to be 190°·5-191°·8 C. This experiment was conducted in a small apparatus, as represented by the enclosed sketch and description, and the heat was conveyed in such a manner that the melting point was reached in fifteen to twenty minutes. Four preparations manufactured by me at different times gave by this process melting points varying between 190°·5 and 191°·8 C. The statements regarding the melting point of aconitine to be found in the literature vary from 184° to 194° C. The latter temperature (193°-194° C.) is given by Ehrenberg and Purfürst in a somewhat extensive treatise published in the 'Journal für prakt. Chemie,' vol. xlv., p. 604. Your letter occasioned me to undertake the task of explaining these discrepancies. In the first place, probably the purity of the preparation is of influence on its melting point, but then also the manner in which the determination of the melting point is conducted. If the experiment be carried out in the apparatus described in such a manner that the temperature be raised but very slowly, one obtains a somewhat lower melting point. The same preparations which I had before found to melt at 190°·5 to 191°·8, showed a melting point of 185°-186° C., as soon as a good half hour was spent on the performance of the operation. In Roth's apparatus, which is latterly frequently employed, the melting point went down still further, for under the same conditions the preparations in question melted at 179°-181° C. In the case of a large number of other bodies I have noticed a similar behaviour, according to the duration of the experiment and the apparatus employed, and I beg to call your attention to a communication of O. Hesse's, recently published in Liebig's 'Annalen der Chemie und Pharmacie,' vol. 276, part iii., p. 342, from which it will be seen that he has made similar observations. *Description of the sketch.*—The glass A, in which the melting point is to be determined, hangs by means of a broad rim quite freely in the glass B. Both glasses are filled as far as is shown in the sketch with liquid paraffin. C is a stirring contrivance, by means of which the paraffin is kept in constant motion. Since the surrounding oil-bath B, and not A itself, is heated directly by the flame, a very uniform and gradual rise of the temperature is attained.



"*Darmstadt.* E. MERCK."

## Answers to Correspondents.

*W. S.*—We regret we are unable to supply the information you require.

## Diary of the Week.

TUESDAY, APRIL 24.

*Royal Institution of Great Britain*, at 3 p.m.
"Electric Illumination" (fourth lecture), by Professor J. A. Fleming.

*Sheffield Microscopical Society*, at 8 p.m.
Practical Night.
Demonstration by the President (Subject, "Diatoms").

THURSDAY, APRIL 26.

*Royal Institution of Great Britain*, at 3 p.m.
"Mozart as a Teacher," by Professor J. F. Bridge.

FRIDAY, APRIL 27.

*Royal Institution of Great Britain*, at 9 p.m.
"Action of Light on Bacteria and Fungi," by Professor H. Marshall Ward.

SATURDAY, APRIL 28.

*Royal Institution of Great Britain*, at 3 p.m.
"Literature and Journalism," by H. D. Traill.

## Books, etc., received.

FORMULAIRE DES MÉDICAMENTS NOUVEAUX ET DES MÉDICATIONS NOUVELLES, POUR 1894. By H. BOCQUILLON-LIMOUSIN. Fifth Edition. Pp. i.-viii., 1 to 314. 3 francs. Paris: J. B. Baillière et fils. From the Publishers.

NATURE'S HYGIENE. By C. T. KINGZETT, F.I.C., F.C.S. Fourth Edition. Pp. i.-xiv., 1 to 502. 10s. London: Baillière, Tindall and Cox. From the Author.

THIRTY-SEVENTH ANNUAL REPORT OF THE COUNCIL OF THE PHARMACEUTICAL SOCIETY OF AUSTRALASIA. 1893. Pp. 1 to 18. Melbourne: College of Pharmacy. From the Secretary.

*Erratum.*—We are desired by Mr. Braithwaite to point out that the heading to the fifth column in the table printed on page 853 should read "Equivalent percentage of Lactate (Mg. or Ca.) in Ash." This omission of the word "equivalent" was inadvertently overlooked in revising the proof. The lactates, however, obviously cannot exist as such in the ash.

*Corrections.*—We are asked by the Secretary to note the following corrections:—P. 861, col. 1, line 36, omit word "Infirmary." P. 866, col. 2, line 36, read "Hinchliffe, Frederic, Lower Weston."

## Notices to Contributors.

**** Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.*

*All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names only commenced with capital letters.*

*When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines, must be supplied not later than a week before the proposed date of publication.*

*Communications should reach the Editorial Department before noon on Wednesday, if publication be desired in the next issue of the Journal; though this cannot always be guaranteed.*

COMMUNICATIONS, LETTERS, etc., received from Messrs. Boa, Brewis, Gare, Hill, Robertson.

## "THE MONTH."

**Calcium Di-phosphate.** A. Joly and E. Sorel, in describing the action of water on this compound, state that if crystals of the hydrated salt be thrown into boiling water, they are rapidly disintegrated, and the liquid, which is acid to litmus, though neutral to methyl-orange, is found to contain a mono-phosphate. On examining the deposit formed, by means of a microscope, no trace of crystallisation is visible, and analysis shows it to consist of an almost pure calcium tri-phosphate. After drying at the ordinary temperature over sulphuric acid, the composition of this compound was found to be $2Ca_3(PO_4)_2.H_2O$. If ebullition be maintained and the volume of water kept constant, a second reaction takes place, between the liquid and the deposit. Small crystals appear, very slowly if the proportion of the calcium di-phosphate were less than one per cent., more rapidly if between that and fifty per cent., but in any case the reaction is complete in about three hours. The final product is a partly amorphous mixture, $CaO{\cdot}P_2O_5$, when not more than ten grammes per litre of calcium di-phosphate is used. Crystallisation is total, however, with larger proportions, an intermediate phosphate apparently being formed, thus—$Ca_3(PO_4)_2 + 4Ca_2H_2(PO_4)_2 + 2H_2O$; whilst with very large proportions, the crystals of the latter are found mixed with those of an anhydrous bi-calcium salt. The transformation of the crystalline hydrated calcium di-phosphate into the crystalline anhydrous salt, by the action of boiling water, appears therefore to be effected in two different stages, the amorphous calcium tri-phosphate being the intermediate product (*Comp. rend.*, cxviii., 738).

**Sodium Borosalicylate.** P. Adam prepares this compound by heating together boric acid and sodium salicylate in the presence of water. A syrupy liquid is produced which yields, on evaporation, a transparent horny substance. This when carefully desiccated becomes a white opaque mass. It dissolves in four times its weight of cold water, and in its own weight of water at 40°. It is also soluble in methylic, ethylic, and amylic alcohols, acetic ether, and glycerin, slightly soluble in acetone, but insoluble in ether. Solutions made by the aid of heat remain supersaturated (*Bull. de la Soc. Chim.*, [3], xi., 204).

**Calcium Phospho-glycerate.** L. Portes and G. Prunier describe a process for preparing this compound. Phospho-glyceric acid is first prepared by maintaining a mixture of liquid phosphoric acid and glycerin at a temperature of 100° to 110° for six days. After cooling, calcium carbonate is added until the acid is neutralised. The precipitate formed is dissolved in cold water, and the solution filtered and evaporated at a low temperature. The product is a white, slightly crystalline, powder, which is soluble in fifteen parts of cold water, almost insoluble in boiling water, insoluble in alcohol, and gives but a faint reaction with ammonium molybdate (*Journ. de Pharm. et de Chim.*, [5], xxix., 393).

**Argentamine.** This is a liquid produced by dissolving ten parts of phosphate or nitrate of silver in one hundred parts of water containing in solution ten parts of diethylamine. In combining with the latter the silver salt loses the power of coagulating proteic substances and of forming a precipitate of silver chloride in the presence of sodium chloride, whilst preserving its antiseptic and astringent action, which is said to be considerably augmented. Argentamine may be diluted with water at will, and has been employed, with successful results, in place of silver nitrate, by Drs. Schäffer and Neisser (*Apot. Zeit.*, ix., 211).

**Solnine.** J. U. Lloyd gives this name to an alkaloid isolated by him from the root of *Solanum carolinense*. It forms brilliant white crystals, and is practically insoluble in water and dilute ammonia, but dissolves freely in dilute acids, forming very soluble salts, which have not yet been crystallised. The salts are acrid and bitter, and leave a persistent tingling sensation on the tongue. The alkaloid is also very soluble in cold chloroform and in boiling alcohol, separating from the latter on cooling in large needle-like crystals resembling hydrastine. By evaporation from an ether solution a glassy residue remains. Water precipitates minute crystals from the alcoholic solution. Professor Pettee describes solnine as crystallising in the orthorhombic system, the crystals being tabular as a rule. Lloyd points out that G. A. Krauss proved the presence of an alkaloidal substance in *S. carolinense* in 1890, and shows that it is doubtful if the product obtained by either of them is identical with solanine. A considerable amount of the alkaloid, however, has been forwarded to Professor Trimble for further examination (*Am. Journ. Pharm.*, lxvi., 161).

**Canadine.** E. Schmidt describes the production of pure canadine from hydrastis rhizome. The alkaloid was obtained in white needles melting at $132^\circ{\cdot}5$, and proved to be tetrahydroberberine, isomeric with hydroberberine, and yielding berberine when a solution was exposed to light and air. Numerous salts and other compounds of canadine are described, for details of which reference must be made to the original account (*Archiv.*, ccxxxii., 136).

**Artificial Production of Citric Acid.** In studying the conversion of sugar into oxalic acid under the influence of certain fungi, Dr. C. Wehmer discovered another analogous kind of fermentation by which citric acid is produced from sugar (*Ph. J.*, *ante*, p. 182). The change is probably the result of a process of oxidation represented by the following equation :—

$$C_6H_{12}O_6 + 3O = C_6H_8O_7 + 2H_2O.$$

A full description of the conditions under which it takes place was given in a paper communicated to the Berlin Academy of Sciences last June. This mode of producing citric acid is now being worked at Thann and Mulhausen, and there is a prospect that, in addition to its scientific interest, it will be of industrial importance. In connection with this subject the *Kew Bulletin* calls attention to the interesting coincidence that citric acid has been found in sugar-cane juice, and that it sometimes makes its appearance during the process of sugar manufacture.

**Paraform.** M. Aronsohn thus designates polymerised formic aldehyde, a substance recommended for use in the intestinal tube as an antiseptic. It is a white crystalline substance, insoluble in water, and Aronsohn claims that of the antiseptics compared with it—β-naphthol, iodoform, dermatol, salol, and benzo-naphthol—the first-named is the only other substance that at all completely checks the development of bacteria. Paraform, however, is superior to β-naphthol, a $\frac{1}{50000}$ solution acting upon typhoid bacilli as effectually as a $\frac{1}{5000}$ solution of the latter. Again, 0·05 Gm. of paraform sterilised 200 Gm. of urine, whilst 0·15 Gm. of β-naphthol was required for the same purpose. A dose of five grammes of paraform did not produce any ill-effects when taken, and its physiological action resembles that of calomel (*Sem. med.*, through *L'Union pharm.*, xxxv., 165).

**Applications of Formic Aldehyde.** At the April meeting of the Berlin Pharmaceutical Society, J. Holfert drew attention to the use of this substance in the preservation of vegetable products. A solution containing only one in two hundred is sufficient for this purpose, and even weaker solutions are efficacious. As a substitute for alcohol in hardening objects for microscopic purposes a four per cent. solution of formic aldehyde is very useful, and it has the advantage of first causing the objects to shrink, as alcohol does. Chlorophyll and other vegetable pigments are not affected by the solution. As an instance of the great disinfecting power of formic aldehyde, it was mentioned that the faint smell of butchers' shops in summer time is completely removed by washing with a solution of it. When used for preserving meat it has the disadvantage of destroying the colour of the blood pigment. Putrefaction is entirely prevented by it, but not the growth of mould. The circumstance that bacteria are killed by formic aldehyde while fungi are not affected, promises to be of use in producing pure cultures of yeast, since the difficulties experienced in conducting processes of fermentation generally arise from the development of bacteria (*Pharm. Centrh.*, xxxv., 225).

**Formaldehyde as an Antiseptic.** Drs. Slater and Rideal conclude, as the result of numerous experiments, that formaldehyde in solution and as a vapour possesses decided antiseptic and disinfectant (?) properties, and suggest that its non-poisonous character, easy vaporisation, and freedom from corrosive or other damaging action on fabrics, will render it useful for many purposes of practical disinfection. The results of their experiments fully confirm the conclusions of Trillat (*Pharm. Journ.*, [3], xxiii., 2 and 181) and others, as to the efficiency of formaldehyde as an antiseptic and sterilising agent, the power of inhibiting the growth of micro-organisms being possessed by it in a high degree. The microbicide power of the vapour of the compound also appears to be very marked, but it is not correct to assume on this account alone that "formaldehyde vapour is obviously a powerful disinfectant." Indeed, no proof of real disinfecting power is given in the published report of the experiments (*Lancet*, 3686, 1006).

**Toxicity of Antiseptics.** Désesquelle and Charrin have compared the toxicity and bactericidal power of a number of recently introduced bodies derived from corrosive sublimate, by the replacement of an equivalent of chlorine by equivalents of various phenols and naphthols. The results are represented in the following table, the antiseptic and bactericidal power of sublimate itself being taken as one hundred :—

| | Antisepticity. | | Toxicity. |
|---|---|---|---|
| Phenol sublimate.............. ... | 104 | ...... | 12·5 |
| Mercury hydroxy-phenolate... | 46 | ...... | 16 |
| Phenol acetate mixed with Hg | 41 | ...... | 16 |
| Naphthol sublimate ............ | 33 | ...... | 27 |
| Mercury β-naphtholate......... | 61 | ...... | 25 |
| Mercury acetate .................. | 50 | .. ... | 45 |

Though the differences in antiseptic power are very marked, the variation in toxicity is evidently much greater (*Nouv. rem.*, x., 159).

**Iodine and Starch.** E. G. Rouvier, in a further communication on the fixation of iodine by starch (*Ph. J.*, *ante*, p. 343), states that when the proportion of iodine is between 13 and 17·5 per cent., the quantity fixed is almost proportional to the cube root of the quantity added. When below 13 per cent., the quantity of iodine fixed increases more rapidly, but with more than 17·5 per cent. present the increase proceeds much more slowly. Potato starch appears, in the presence of a large excess of iodine, to fix a lower quantity than wheat starch, but rice starch behaves exactly the same as the latter (*Comp. rend.*, cxviii., 743).

**Essential Oil in Asparagus.** Crouzel has ascertained that the peculiar odour of the urine after eating asparagus is not due to the presence of asparagin, but to a volatile oil which he has extracted from asparagus, and from urine passed after eating asparagus (*Deutsch. Med. Ztg.*, through *Pharm. Centrh.*, xxxv., 217).

**Balsam of Peru.** H. Trog has examined balsam of Peru, and found that the fluid portion of the balsam consists almost entirely of benzyl benzoate, only a very small proportion of benzyl cinnamate being present. Neither phenylpropyl cinnamate, styracin, free benzyl, alcohol, or benzoic acid could be detected; on the other hand, free cinnamic acid and vanillin were present. The resin proved to be an ester. By saponification it yielded cinnamic with a little benzoic acid and a resin alcohol, peru-resino-tannol, probably derived from a tannin. The bark of the tree contained minute quantities of phloroglucin, tannin, phlobaphene, wax, and non-saponifiable resin. In very young twigs resin ducts were found, but these were soon thrown off in the growth of the plant, and no others formed. Balsam of Peru is, therefore, like benzoin, a pathological product (*Archiv.*, ccxxxii., 71).

**Pycnanthemum linifolium.** An analysis of this plant has been made by H. C. Barker, who failed to detect the presence of alkaloids or glucosides, but found starch, glucose, and a small quantity of ethereal oil. The detection of starch led to a re-examination of *P. lanceolatum* (*ante*, p. 735), but chemical tests failed to indicate the presence of the carbohydrate in the latter, though on microscopical examination bodies were observed which were almost certainly starch granules, but they were quite small and few in number (*Am. Journ. Pharm.*, lxvi., 169).

**Galbanum.** A. Conrady finds that, in addition to ·25 per cent. of free umbelliferone, the resin of galbanum contains no less than 20 per cent. of that principle combined with a resin alcohol, galba-resino-tannol, so as to form an ether. This compound was decomposed by heating in a mixture of three parts of sulphuric acid with five of water, complete decomposition being very tedious. Caustic potash saponifies the ether, but the umbelliferone is converted simultaneously into umbellic acid. The latter body produces a characteristic green coloration when galbanum resin is boiled with caustic potash and chloroform, whereas the violet reaction with hot alcohol and hydrochloric acid is due to the volatile oil (*Archiv.*, ccxxxii., 98).

**Sanguinaria Seeds.** J. Culley has examined the seeds of *Sanguinaria canadensis*, and finds they contain fixed oil, resin, alkaloid, glucose, pectin, calcium oxalate, pararabin, etc. The petroleum ether extract, consisting mainly of fixed oil, amounted to 28·196 per cent., and the alkaloidal reactions accorded well with those of sanguinarine (*Am. Journ. Pharm.*, lxvi., 189).

**Castor Oil as an Adulterant.** L. Maupy describes a method of detecting castor oil in croton oil or copaiba, which is based on the reaction that occurs when castor oil is subjected to dry distillation in the presence of potash or soda, sebacic acid and caprylic alcohol then resulting from the decomposition of ricinoleic acid, thus—

$$C_{18}H_{34}O_3 + 2KOH = C_{10}H_{16}K_2O_4 + C_8H_{18}O + H_2.$$

The sebacic acid, obtained by treating the alkaline sebacate with a mineral acid, is insoluble in cold, but soluble in boiling water. Oleic acid submitted to distillation also yields sebacic acid, but the latter is not produced from olive or poppy oil in presence of excess of alkali, and it is probable that in this respect castor oil may be peculiar. In testing suspected copaiba ten grammes of it is warmed gently in a silver capsule with as much dry caustic soda. When the effervescence subsides the odour of caprylic alcohol will indicate the presence of any castor oil. Subsequently, the product of the reaction is treated with about fifty grammes of distilled water and warmed to assist solution. When cold the insoluble resin is filtered out, and the liquid treated in a porcelain capsule with excess of nitric acid. It is then boiled and filtered whilst hot. On cooling, if castor oil has been present, a white precipitate of sebacic acid forms, which is soluble in boiling water, and precipitated from the solution by subacetate of lead as sebacate of lead. This process is said to detect as little as a few drops of castor oil in ten grammes of copaiba. In the case of croton oil the procedure is the same, except that only five grammes of oil should be treated and the other substances reduced in quantity by half (*Journ. de pharm. et de chim.*, [5], xxix., 362).

**African Cinchona Bark.** In the *Kew Bulletin* for April, reference is made to the fact that early in the present year a quantity of red cinchona bark, from *C. succirubra*, was sold at the London sales as "West Coast African bark." It is shown that the bark may be regarded as being derived solely from cultivated trees, grown from seeds or plants originally obtained from South America. The whole of it, moreover, appears to come from the Portuguese island of St. Thomas, and there is no evidence that cinchona is cultivated anywhere on the mainland of the West Coast of Africa. A sample of bark grown at St. Thomas, and presented to the Royal Gardens in 1884, was certified as yielding crystallised quinine, 2·64 per cent. ; crystallised quinidine, 0·11 ; crystallised cinchonidine, 0·48 ; cinchonine, 4·06 ; amorphous alkaloid, 1·00.

**Irritability of Plants.** Professor Pfeffer, in an address on this subject, points out that irritability is a fundamental quality existing in all plants, those organisms having the same power of reaction to stimulation as animals. An increase of stimulus in plants, too, produces a dulling of sensitiveness. At the same time a plant or plant-organ is never sensitive to a single stimulus only, and different stimuli do not produce one and the same effect in a given cell. Whilst plants exhibit a variety of sensibilities equal to that of animals, in delicacy of perception the vegetable kingdom has the advantage, bacteria being attracted by a billionth or trillionth of a milligramme of meat extract or of oxygen (*Nature*, xlix., 586).

**Anatomical Modifications in Plants.** W. Russell finds that plants growing in the Mediterranean district differ from the same species found in the neighbourhood of Paris in the following respects :—the cells of the epidermis are larger, more regular in outline, and have thicker walls ; the assimilative tissue of the bark predominates over the chlorophyll-free parenchyma, and the latter is transformed into protective tissue ; there is an increase in the diameter of the vessels, and the leaves become augmented in thickness by the great development of palisade tissue (*Comp. rend.*, cxviii., 884).

**Physiology of Cuscuta.** G. J. Peirce records the results of a number of experiments with species of *Cuscuta*, or dodder. These are parasitic climbing plants, which at certain stages twine as the result of the combined effects of circumnutation and geotropism, and at others by contact-irritation, which modifies the manner of coiling and accelerates its speed. Haustoria are usually formed upon the concave surfaces only of the close coils, and are the result of irritation, their development depending upon contact and nourishment. Chlorophyll is frequently absent from these plants, but is formed whenever they are insufficiently nourished, and the intensity of the green colour may then serve as an index of the amount of organic food they are receiving. The only plants open to attack by the parasites are those of which the size, peripheral tissues, internal structure, cell-contents, and secretions allow them to be closely embraced and readily penetrated by the haustoria, and whose conducting tissues speedily unite with those of the parasites, whilst they produce no poisonous effects by their cell-contents or secretions. Such changes as take place in the host plants are rarely anatomical, the effects being mainly physiological. The penetration of the haustoria is effected by means of mechanical pressure, and the chemical activity of the pre-haustoria and cells at the tips of the haustoria proper, aided by the action of the cushion-cells. The "pre-haustorium" consists of the long papillate cells in the centre of the "cushion" of older authors, and the "cushion-cells" are the other modified epidermal cells. The tips of the latter partially dissolve and fuse with the walls of the opposite epidermal cells of the leaf attacked, and thus securely hold it, whilst the papillate cells of the pre-haustorium perforate the walls by more complete solution, and, growing through the holes thus made, enter the mesophyll of the leaf. The stem of the parasite can then brace, and so assist the forward growth of the haustorium, which grows through the centre of the area of attachment, and advances by the way partly excavated by the papillate cells (*Annals of Botany*, viii., 53).

**Bacteria of Whooping Cough.** In the current number of the *International Journal of Microscopy and Natural Science* appears a translation of the first instalment of an important memoir by Dr. Filandro Vicentini, on the bacteria found in the sputa of whooping cough. A summary is given of previous researches on the subject, and this is followed by notes on clinical cases in which the sputa have been examined. The text is illustrated by an elaborate coloured plate, in which the various bacterial forms are depicted at different stages of their development. The remaining sections of the memoir will deal, in detail, with myelin, bacteria, and fungi in the sputum. Particulars will also be given of the methods of preparing and staining specimens, and the whole should form a valuable addition to the literature of the subject.

**Tubercle Bacilli in Sputum.** Ilkewitsch detects tubercle bacilli in sputum by mixing, in a porcelain capsule, suspected sputum, 0·5 C.c.; distilled water, 20 C.c.; and caustic potash solution (30 per cent.), 8 to 12 drops. The mixture is well stirred with a glass rod and heated until vapour is given off. When the sputum is quite dissolved a little casein is added, which also dissolves, under the combined influence of heat, stirring, and one or two drops more of the caustic potash solution. The milky fluid resulting is placed in a test tube, and acetic acid added, drop by drop, until clotting of the albumin commences. The mixture is then submitted to centrifugal action for five to ten minutes, all the bacilli present being thus carried down with the casein. The deposit is collected and rubbed between two slides, the two preparations are dried, fixed in the flame as usual, stained by Ziehl's method, and examined under an oil immersion lens without a cover slip. Compared with other methods, this of Ilkewitsch is said to have the advantage of allowing a larger amount of material to be examined in a short time (*Central. f. Bakt.*, through *B. M. J. Epit.*, 1738, 64).

**Colourless Dammar.** It is stated that dammar resin may be decolorised by dissolving it in benzol, and clarifying the solution by filtration through paper in a closed vessel, or by agitation with zinc oxide, which, on subsiding, carries all foreign matters to the bottom. The resin is afterwards precipitated from the clear solution by adding alcohol. After washing the precipitate two or three times with absolute alcohol, it is dried, and the resulting white powder is redissolved in pure benzol, when a practically colourless solution results. A tendency to brittleness in the layer of resin left on evaporation of this solution is counteracted by the addition of a little poppy oil. The residual alcoholic mixture leaves, on evaporation, a tenacious and slowly-drying residue, which is said to make an excellent cement basis (*Inter. Journ. Micros.*, [3], iv., 200).

**Saccharolyser** G. Dethan applies this name to an apparatus devised by him for manufacturing syrups in the cold. It consists of an upright copper cylinder fitted inside, rather more than half-way from the top, with two diaphragms, between which the filtering medium is placed. A second cylinder fitting into the upper chamber thus formed is perforated all round and at the bottom; a glass tube connected at top and bottom with the outer cylinder serves as a gauge of the amount of liquid present and, by means of a contained float, of its density; whilst the tap for drawing off the contents is connected with a syphon. The sugar is introduced into the perforated cylinder and water poured over it. Syrup commences to form at once and, passing through the diaphragms with an intervening layer of paper pulp, is effectively filtered. It collects in the lower chamber and, when of the proper degree of concentration, as indicated by the float in the glass gauge, may be drawn off for use. Fresh sugar and water may be added to the apparatus from time to time, without special care as to the proportions, and the process may be rendered a continuous one, syrup being drawn off whenever the required density is indicated by the float. The advantages claimed for the apparatus, which is patented, are that it produces colourless syrup, free from glucose, and of definite strength, automatically and without risk of evaporation (*Journ. der Pharm. von Elsass-Loth.*, xxi., 118).

**Mucilage in Yew.** Mangin observes that the palisade cells of the yew leaf contain mucilage, the presence of which can be demonstrated by macerating small fragments in alcohol strongly acidulated with hydrochloric acid, washing, and transferring to dilute ammonium oxalate. This treatment dissolves the pectate of calcium, of which the author considers the middle lamella to consist, and liberates the cells. The epidermis and fibrovascular bundles can be removed by straining through a fine platinum wire gauze; the parenchymatous cells which pass through can be stained with naphthalene blue and acid green, the mucilage acquiring a violet colour. The part it plays on the palisade cells is not known (*Bull. de la Soc. Bot. de France*, [2], xv., 315).

**Toxic Effects of Tobacco.** Dr. G. P. Hall considers that, of the various methods of using tobacco, smoking is beyond question the most noxious, and the use of cigarettes is specially objectionable, since the smoke is often inhaled, and the quality of the tobacco inferior. The local effect upon the throat and nose is largely over-rated, the chief effect being produced on the medullary nerve-centres, Huchard referring on this point to the "irritable heart" of smokers. The latter also points out that this action of tobacco in producing functional cardiac disturbances is not merely due to its effect on the nervous system in general and the pneumogastric in particular, but in great measure to its action on the muscular system in general, and particularly upon the vascular walls. Tobacco, therefore, is not simply a cardiac poison; it is also an arterial poison. It produces disturbances in the nerve-centres, the respiratory apparatus, the kidneys, and the heart, and its effects, when past the physiological limit, are very wide and far-reaching, often falling in some degree on any one or more of the nerves or nerve-centres of special sensation, affections of the visual apparatus being most frequent (*Inter. Med. Mag.*, iii., 178).

## MECCA BALSAM AND MYRRH.*

The south-western districts of Arabia and the north-eastern corner of Africa are characterised by the production of trees yielding aromatic exudations. G. Schweinfurth observes that, although the shrub yielding mecca balsam, *Commiphora opobalsamum*, Engl., is widely distributed over the coast territory of Arabia, the adjacent islands, and southern Nubia, the balsam is collected only in the valleys near Mecca; the plants producing olibanum and myrrh prefer low mountains, 3000 to 5000 feet high, and rocky soil. *C. opobalsamum* averages about fifteen feet in height, possesses a yellow papery exfoliating bark, and produces long, thin, greyish black twigs, from the ends of which a small quantity of balsam exudes. Although not an eye-witness of its collection, Schweinfurth thinks the balsam must be obtained by crushing and boiling the ends of the twigs, or by pouring boiling water over them. Collection by exudation is out of the question, as only a few centimetres towards the ends of the twigs contain much sap, appear varnishy, and yield when incised minute drops of bright green fluid possessing the characteristic odour of mecca balsam. This is the substance referred to in the bible under the name of myrrh, an error attributable probably to the similarity of the old Hebrew word "mōr" with the late Arabic designation "morr" for the gum resin myrrh. It appears never to have been collected in large quantity; according to information from the principal spice merchant in Cairo, at the present time only a few kilogrammes are annually brought to the market.

Myrrh, according to Schweinfurth, can be yielded only by *C. abyssinica* or *C. schimperi*, and is probably obtained principally from the former, which is widely distributed, and in certain districts abundant. A. Deflers actually collected myrrh from this plant, which was pointed out to him in the Fadhli district east of Aden as the source of the myrrh brought thence in large quantities into commerce, and a specimen of this myrrh was presented by Schweinfurth to the Pharmaceutical Society of Berlin. The tree is a small one, seldom exceeding 30 feet in height, with a yellow or brown shining papery exfoliating bark. When incised the bark yields abundance of yellowish milky fluid, which solidifies to myrrh. The plant also occurs in northern Abyssinia, but not in such abundance as to offer sufficient inducement to collect the gum-resin; the drug comes probably from the northern districts of Yemen and the mountains of Assir. *Balsamodendron myrrha (Hemprichia myrrha*, Nees, Schwf.) yields no myrrh; the plant is completely odourless, and yields no trace of resin when branch or stem is incised. Hemprich noted on his specimen that possibly this species yielded myrrh, but the evidence to that effect was insufficient. Nees v. Esenbeck described the plant, however, as the source of Arabian myrrh, hence the error. *C. schimperi* grows in Yemen, and produces abundance of gum-resin closely resembling myrrh. It is also found in Abyssinia, where, however, little or no myrrh is collected from it.

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* From a report of the Pharm. Soc. of Berlin.

The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, APRIL 28, 1894.*

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## IMPORTANT DECISION UNDER THE PHARMACY ACT.

THE appeal against the judgment given by his Honour Judge KENELM DIGBY in the Derby County Court (see *ante*, pp. 675 and 768) came on for hearing last Thursday, before Mr. Justice CHARLES and Mr. Justice BRUCE, in the Court of Queen's Bench, and the judgment in favour of the Pharmaceutical Society has been upheld. A report of the proceedings will be found at page 902 of the present number of the Journal.

Mr. BONSEY, the counsel for the appellant, after stating the provisions of the Pharmacy Act in regard to the sale of poisons, went on to say that he disputed the proposition that any compound containing, as an ingredient, one of the poisons in the schedule, in any quantity, is an article within the meaning of the Act, and can be sold only by a registered chemist. His contention, on the contrary, was that the Act does not apply to a compound, in which one of the ingredients is a poison, and that it only applies to the sale of poisons in their simple state. As this point has already been decided against him, it was not argued, but only referred to in view of the possibility that the case might go further. It may, however, be mentioned here that the argument as to the Act applying only to poisons pure and simple does not amount to much as regards the question raised by the appellant, since preparations of morphine are included in the schedule, and consequently, for the purposes of the Act, they are as much poisons pure and simple as morphine or opium themselves. There is, in fact, no distinction made between the articles in the schedule beyond the precautions applying to those in the first or second part. Moreover, preparations of morphine are poisons, within the meaning of the Act, not because they contain morphine as one of their ingredients, but because they are in the schedule. That is what determines whether an article is a poison or not. The wider question as to What is a poison? which perplexes Mr. Bonsey, has been avoided by the Act, and the difficulties which would attend its solution have been obviated by a precise specification of the several articles which "shall be deemed to be poisons." Preparations of morphine and of opium are among those articles, and hence it would appear that there is really no occasion to seek for a definition of poison. It is, indeed, remarkable that this view of the matter has hitherto received little or no attention.

Mr. Bonsey's chief argument, that the question which was decided by his Honour Judge Digby was not a pure question of fact, was chiefly based upon the assumption that there is a necessity for a definition of what a poison is, so that the facts of a case could be applied to that definition. He contended that in determining the questions of fact there were questions of law to be taken into consideration, and that his Honour Judge Digby had not applied those considerations to the facts of the case, so that it was really a question of law and not one of fact which had to be decided in the Derby case. In answer to the objection of Mr. Justice Charles, that this was attempting to argue Piper's case over again, it was maintained that the judgment in Piper's case only decided that a thing was within the meaning of the Act if it was in its entirety a poisonous thing, and that the decision was open to the objection that such a construction of the Act would altogether prohibit the sale of proprietary medicines even by chemists. From the fact of their being secret preparations it was argued that no chemist knows the ingredients they contain, and that even chemists could not apply to their sale the regulations of the seventeenth section of the Act. The answer to that argument was given in very unmistakable terms by Mr. Justice Collins in his judgment on the Piper appeal, where he says that if a proprietary medicine is really worth the while of the public to buy, and therefore worth the while of the chemist to sell, surely it is quite worth his while to ascertain by analysis what is the amount of deleterious ingredient in any given compound, and when that has been once ascertained and circulated among chemists there will be no difficulty whatever in the chemist conforming to the provisions in section 17, by putting down the amount of the poisonous ingredient, and thereby securing all the ends intended by the Legislature. That he held to be a less inconvenience than leaving the sale of poison in the hands of thoroughly incompetent persons, which he regarded as a greater inconvenience, broadly opposed to the main scheme of the Pharmacy Act. The remarks with which Mr. Justice Bruce supplemented his expression of concurrence in the judgment delivered by Mr. Justice Charles were thoroughly in accord with the above view. As compared with the importance of restraining incompetent persons from dealing in poisons, he regarded any alleged inconvenience resulting from such restriction as not being worth considering. In reference also to the claim that dangerous medicines are likely to be rendered innocuous by the instructions for use placed upon them, he pointed out that experience points in the opposite direction, and that the public should therefore have the protection which was intended by the Act. That view of the matter has especial cogency in relation to preparations containing potent ingredients, which should only be administered under medical direction.

### IRREGULAR SALE OF POISONS.

The *British Medical Journal*, commenting upon the recent prosecutions for irregular sales of poisons at Leeds, remarks that trade associations such as the Patent Medicine Vendors' Association will probably apply their energies to keeping chemists up to the mark in fulfilling the requirements of the Pharmacy Act, and adds that though such a stimulus ought not to have been needed, it cannot fail to be of service, from the point of view of public interest and safety, that the provisions of a Statute so useful as the Pharmacy Act should be enforced in one way or another, whatever may be the motive of the action taken for that purpose.

### GERMAN NATURALISTS AND PHYSICIANS.

The meeting of this Association this year will take place at Vienna, from September 24 to 30, and one of the sections (No. 21) will be devoted to pharmacy. The arrangements connected with this section are being carried out by Herr A. von Waldheim (I Neuer Markt 7) and two secretaries, Herr A. I. Sicha (IX/2 Spitalgasse 31) and Dr. A. Schlosser (IV Wiedener Hauptstrasse 40a). A general invitation to take part in the proceedings of the meeting is being given by them in the German pharmaceutical journals, with the request that they may be notified of papers to be read, as it is intended that a preliminary programme shall be sent with the individual invitations to be issued early in July. During the meeting there will be an exhibition, and those who may desire to contribute to it are requested to communicate with the Exhibition Committee of the "Versammlung Deutscher Naturforscher und Aerzte I. Franzensring, Universiätt," Vienna. For the purposes of demonstration and experimental illustration of papers, the apparatus and appliances of the Austrian Pharmaceutical Society will be placed at the disposal of the readers of papers, etc. The arrangements for the section (No. 20) on pharmacology and pharmacognosy will be in charge of Prof. A. Vogl (IX Ferstelgasse 1) and two secretaries, Dr. A. Hinterberger (IX Pelikangasse 18) and Dr. Hans Arzberger (I Habsburgergasse 11), and the resources of the Pharmacological Institute will be at the service of contributors to the section, for demonstration purposes.

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### THE VAGARIES OF MODERN PHARMACY.

At the conclusion of an interesting and instructive address, delivered at the recent meeting of the International Medical Congress, Professor B. J. Stokvis, of Amsterdam University, spoke of what he termed "the vagaries of modern pharmacy." Physicians, he said, were tempted to cry out for mercy as new chemical products continued to be forced upon the therapeutic market under attractive names, and were proclaimed aloud with the noise of the most perfect advertising machinery, to such an extent as to be detrimental to the interests of therapeutics. He did not refer to quack remedies, the secret specifics which medical men viewed with wholesome horror, but to products of known composition, to which fancy names—such as antinervine, anti-phthisine, anti-rheumatic, antidysenterine, and migrainine—were applied. It was not sufficient nowadays to have a good remedy, but a euphonious, sonorous name must be sought for it, pompously proclaiming the therapeutic use and effect of the drug, and suggesting its amateur use by the public, a course he could not blame too severely. He could not, however, suggest how to check the fury of this flood of remedies with undesirably descriptive names, and doubted whether it would ever come to an end.

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### AMERICAN JOURNAL OF PHARMACY.

It is announced that Professor Henry Trimble has been appointed editor of the official organ of the Philadelphia College of Pharmacy. First issued in December, 1825, there were frequent changes in the staff of the journal until 1850, when Professor Procter assumed sole editorial charge, being succeeded by the late Professor J. M. Maisch in 1871. During twenty-two years the latter filled the position, which he occupied until his death last autumn. The newly-appointed editor is Professor of Analytical Chemistry in the Philadelphia College of Pharmacy, and has published the results of numerous important and useful investigations, and it is hoped that under his supervision the *American Journal of Pharmacy* will enter upon a new period of usefulness.

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### CEYLON BOTANIC GARDENS.

In Mr. H. Trimen's report for 1893, as director of these gardens, he points out that Ceylon cinchona bark will soon be a thing of the past, the export for the year being little above half that of 1892. A large distribution of the seed of *Hevea brasiliensis*, a source of indiarubber, was made to planters, and rubber obtained from *Castilloa elastica* has been favourably reported on. Ceara rubber, from *Manihot glaziovii*, is not yet produced to any extent. As regards gambir, none of the seed produced germinated, and the climate is probably unsuitable for it. Two coca plants are cultivated, *Erythroxylon coca* and the smaller-leaved form named var. *novo-granatense*. The latter appears to be less valuable than the older kind. Authentic specimens of *Piper cubeba* are growing luxuriantly in the Gardens, but are unfortunately all male plants. About 2,000 seedlings of the camphor laurel, *Cinnamomum camphora*, are now at Hakgala, but the tree never flowers at the Botanic Gardens. It is stated that more than 118,000 seeds from nutmeg trees have been distributed during the last ten years. The second part of the "Handbook to the Flora of Ceylon," which is expected to be published shortly, will deal with about 600 species (to end of Rubiaceæ), and be illustrated by twenty-five coloured plates.

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### ROYAL GARDENS, KEW.

In the current number of the *Kew Bulletin* it is stated that a recent survey of the Royal Gardens shows that the area in which cultivation is carried on under glass is 2·064 acres, and the linear extent of footpaths about 14 miles, 48 chains. The collection of hardy ligneous Leguminosæ near the Pagoda has now been entirely rearranged, and it is expected that it will shortly prove of considerable interest to botanists and others. Recent donations to the establishment include a series of some thirty finely executed photographic views taken in the Buitenzorg Botanic Gardens, Java, received from the Director, Dr. Treub; about two hundred finely executed coloured drawings of conspicuous Indian and Malayan plants; eighty-five coloured drawings of native Mauritian plants; and a large series of duplicates of plants collected in Kini Balu and the tropical region of North Borneo, brought to England by Dr. Haviland. A number of valuable works on fungi have also been presented to the library by the Bentham Trustees, who have purchased them from the library of Dr. M. C. Cooke.

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### THE MARTINDALE HERBARIUM.

We are informed that at a meeting of the Board of Trustees of the Philadelphia College of Pharmacy, held April 3, Mr. Howard B. French presented this herbarium to the College. It is described as the largest systematic herbarium in America, containing more than 200,000 plants and ferns, gathered throughout the whole world, and was the life work of the late Isaac C. Martindale, Treasurer of the Philadelphia Academy of Natural Sciences, who made it the finest private collection in the United States. The specimens are all systematically named and classified, and enclosed in handsome walnut cases. This collection was largely used by Professor Britton, of Columbia College, while compiling the 'Flora of New Jersey' for the Geological Survey, and will be kept entirely distinct from that already owned by the College, being known as the "Martindale Herbarium," presented by Howard B. French and the Smith, Kline, and French Co. The *Alumni Report*, of Philadelphia, remarks that this gift will afford facilities for teaching botany in the college such as are possessed by no other school in America.

# Transactions of the Pharmaceutical Society of Great Britain.

## MEETING OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

MR. J. LAIDLAW EWING IN THE CHAIR.

A meeting of the Executive of the North British Branch was held in the Society's House, 36, York Place, Edinburgh, on Thursday, April 19, at 12 noon.

Present:—Messrs. Ewing and Lunan, Edinburgh; Currie and McAdam, Glasgow; Davidson, Montrose; Fisher, Dunfermline; Kermath, St. Andrews; Kerr, Dundee; Johnston and Strachan, Aberdeen; and Nesbit, Portobello.

Apologies for absence were received from Messrs. Gibson, Noble, and Stephenson, Edinburgh; Hardie, Dundee; Kinninmont, Glasgow; Paterson, Aberdeen; Storrar, Kirkcaldy; and Sutherland, Dumfries.

The minutes of last meeting were read and approved.

The report of the General Purposes Committee was read, from which it appeared that tenders for the new hall and laboratories, amounting to £1605, and a further estimate amounting to £370 for internal fittings and plumber work, had been accepted, and the work was in an advanced state. The Committee reported that local secretaries had been appointed for all the centres recommended by the Executive, Coldstream being substituted for Kelso. The Committee also reported that the evening meetings had been successfully carried out.

On the motion of Mr. Kermath, seconded by Mr Johnston, the report was adopted.

The Chairman stated that the work in connection with the new buildings was proceeding in a satisfactory manner. During the excavations they came upon a stratum of clay, from which there was an unexpected flow of water, but by suitable drainage they had, the architect assured them, made ample provision against any damage from that quarter. This had caused a little delay and some extra expense, but the work was well forward, and it was anticipated that the hall and laboratories would be ready for occupation about October. At the present moment there had been about one week's delay in completing the roof, owing to the rain.

It was again remitted to the General Purposes Committee with powers to take what further steps might be necessary for carrying out the work in a satisfactory manner, and the Chairman and Mr. Nesbit were appointed to superintend the carrying out of details.

The Executive went into Committee to consider the annual report to the Council, and on resuming, the report was adopted on the motion of the Chairman, seconded by the Vice-Chairman, and ordered to be forwarded to the Council.

On the motion of Mr. Kermath, seconded by Mr. Fisher, it was agreed:—

> "That the next election of Executive take place on Thursday, June 21, 1894, and that the Chairman and Vice-Chairman be appointed scrutineers of the voting papers, with power to add to their number."

The Executive then went into Committee to consider private business.

# Provincial Transactions.

## LIVERPOOL CHEMISTS' ASSOCIATION.

The third general meeting of the forty-fifth session was held at the Royal Institution on Thursday, April 19, the President, Mr. J. J. Smith, in the chair.

Dr. Symes called attention to the proposed imposition of an extra duty of 6*d.* per gallon on proof spirit. Chemists had not only the taxes that other people had to pay, but, along with hospitals and other charitable institutions, were mulct in a penalty, and had to bear an additional heavy tax which they could not recover from the public. When Mr. Goschen made a similar proposal, some effort was made to exempt chemists from the duty, and the reply to representatives was that the difficulties and cost of such exemption would be too great. This was an excellent illustration of the possible usefulness of an organisation such as the proposed federation of local associations. If this body were now established and in full working order—representing so many societies, each having a large membership in the provinces—its influence might have been strong enough, together with that of the Pharmaceutical Society, to obtain the exemption.

Mr. Conroy supported Dr. Symes' protest, and hoped the report of his remarks would be widely circulated. It was undoubtedly a hardship on chemists in the retail. In the wholesale they could recover; but he pointed out that Sir William Harcourt, in stating that the additional tax on beer would amount to $\frac{1}{6}$*d.* per gallon, implied that it must come out of the pockets of the retailers.

The following paper was then read:—

### LINIMENTUM SAPONIS.

BY J. T. HORNBLOWER.

The preparation which forms the subject of this note is a very familiar one to all of us. The chief ingredient, of course, is the soap—sapo durus, hard soap, or white castile soap, an oleo-palmitate of soda, the corresponding salt of potash constituting the softer preparation known as sapo mollis. The B.P. gives certain characters and tests for this hard soap, as regards colour, consistence, ash, behaviour to litmus, and solubility in rectified spirit. I take this to mean cold spirit, as no mention is made of using heat, but I have never had a sample of hard soap soluble in cold spirit. In the U.S. Pharmacopœia it is given as "soluble in water and alcohol, but more readily with the aid of heat." An ordinary olive oil soap with a soda base is not so completely soluble as one would wish. The partial or incomplete solubility is probably due to the fact of hard soap not being entirely an oleate, but containing a certain amount of palmitate, etc., and this will necessarily vary as the oil does from which it is made. To remedy this Mr. C. H. Wood, in 1870, proposed making a soap from almond oil instead of olive. This makes a very good and soluble soap. Then, in 1874, Professor Tichbourne, in a paper to the Pharmaceutical Conference, advocated the use of oleic acid for making the soap. The advantages he claimed were that all the soap was in solution, and that in a perfectly neutral state, for if excess of soda had been used the spirit would have precipitated it. It is certainly better, however, for an ordinary and every-day preparation like lin. saponis to have a definite soap to start with, rather than extemporise the preparation. The last reference to a soap for this liniment was in 1882, when an American, Mr. George, suggested making one from oleic acid and caustic soda, the oleic acid being previously made by decomposing castile soap and then purifying with oxide of lead, etc. This process would be undoubtedly a practical impossibility with the average chemist. I have once or twice made soap for this liniment from oleic acid and caustic soda, and it works well. In an experiment made with as good a specimen of hard soap as I could get, 2 ozs. of the soap was macerated in the menstruum of 16 ozs. of spirit and 4 ozs. of water for a week, and then filtered off, the result being that after weighing what remained on the filter and making the proper allowance for moisture there was 124 grains left, equal to 14 per cent. A small quantity of soda soap made from a very fine sample of olive oil, although more soluble than the ordinary soap used, was not all soluble. I have always favoured the idea of making this liniment from a good soft soap, this being relatively more soluble than a hard soap, and, so far as I can see, there is no real reason why it should not be done, because it must be equally as efficacious as a liniment, and it is much easier made, a potash soap dissolving more freely than a soda one. Although it may be possible to make a soda soap which is far more soluble than a good trade one, and though the corresponding potash soap may not by some be regarded as much more soluble than the soda one, yet we have to do with trade samples, an average chemist not being in a position as a rule to make his own soap, so that a good trade sample of potash olive oil soap is more preferable. I think that upon enquiry it would be found that many chemists already use soft soap. According to the late Professor Redwood, the samples of potash soap which he examined, when he was making experiments with lin. terebinth., were singularly free from caustic alkali, though they all contained carbonate. This is important, because by testing such a soap with the spirit necessary to form the liniment, the carbonate would be left undissolved, being insoluble in the spirit, and the solution could then be added to the water, camphor, etc. There is yet another reason, though some may take exception to it, and that is, the extra loss in filtering a liniment containing a considerable amount (in bulk) of undissolved matter. Of course if that were of a heavy granular nature, the loss would not be so great, but in this case, where you only have to make half a gallon or so, it may not be considered of any moment, though the loss will of course be in proportion, and still remains. What I have to suggest, then, as the outcome of my note, is the change from hard to soft soap for making the liniment. As to the formula to be adopted, I leave that to the proper persons to deal with it, as some other points would have to be considered, most notably the tests for soft soap, as at present existing in the B.P. The present colour is undoubtedy wrong, and Professor Redwood acknowledged the error, as the 1864 Pharmacopœia gives the colour as "yellowish white," though the actual colour will, I think, possibly depend to a certain extent on the amount of water contained. Then a test would have to be introduced controlling the alkalinity, as in the U.S.P.

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The reading of the paper was followed by a discussion, in which Dr. Symes, Messrs. Conroy, Hanson, Wokes, and Buck joined, and a vote of thanks was accorded to Mr. Hornblower, after which the meeting terminated.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

A meeting of the above Association was held at the Mason College on Thursday, April 19, Mr. C. Thompson, President, presiding.

The following paper was read:—

### NOTE ON EXTRACT OF ACONITE.

BY F. CASSON.

Six samples of extract of aconite were obtained from various wholesale houses. These are referred to below as Nos. 1 to 6.

*Colour.*—Nos. 1, 2, 3, 5, 6 had the ordinary appearance and colour of a green extract. No. 4 was of a dark brown colour, somewhat resembling that of extract of opium.

*Consistence.*—Nos. 1, 3, 6 may be described as fairly soft, Nos. 2 and 5 very soft, and No. 4 hard.

*Moisture and Ash* were determined in the usual way, and the latter was examined for copper with negative results.

*Ether-soluble Alkaloids* were next determined by the following process:—

10 Gm. of the extract was dissolved in water, 5 C.c. acetic acid, and 25 C.c. of lead acetate solution, 1 in 4, added. The filtrate was measured, the lead precipitated by means of sodium phosphate, and the liquor again filtered. A quantity of the filtrate equal to 5 Gm. of the extract was shaken once or twice with ether while acid, the ether separated, the liquid rendered alkaline, and the alkaloid shaken out by ether in the usual way. The ether was evaporated off and the alkaloid weighed. The results obtained were as follows:—

| No | Colour. | Consistence. | Moisture. | Ash. | Ether-sol. Alkaloids. |
|---|---|---|---|---|---|
| 1 | Greenish-brown. | Fairly soft. | 24 6 | 15·0 | ·27 |
| 2 | do. | Very soft. | 28·8 | 16·0 | ·20 |
| 3 | Brownish-green. | Fairly soft. | 19 8 | 19·4 | ·16 |
| 4 | Brown. | Hard. | 21·6 | 18 09 | ·28 |
| 5 | Greenish-brown. | Very soft. | 28·7 | 14·6 | ·20 |
| 6 | do. | Fairly soft. | 27·18 | 15·5 | ·17 |

Now the yield of extract from the fresh herb is about 7 per cent., and taking Squire's figures of ·3 per cent. of alkaloids in the dry leaf as being ·056 on the fresh, we should expect a well-prepared green extract to contain ·8 per cent. of alkaloid; whereas the average of the above table is ·213 per cent. There is, then, obviously a considerable loss of alkaloid during the manufacturing process. A considerable variation is also to be noticed in the alkaloidal content of the different samples—a variation having a most important effect on the value of the extract as a therapeutic agent.

Thus, the maximum dose of the extract is one grain, containing, according to an average of the above figures, ·0021 grain of ether-soluble alkaloids. But the dose of the tincture, which may be regarded as containing ·05 per cent. of alkaloids, is 15 minims, or ·007 grain alkaloid. Hence a maximum dose of the tincture is more than three times more active than a maximum dose of the extract.

It being impossible to subject a green extract to any accurate process of standardisation, it would seem expedient for the use of this extract to be discontinued, and for it to be substituted by some more reliable preparation.

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A short discussion afterwards took place, and a vote of thanks was passed to Mr. Casson for his paper.

A discussion on the carbolic acid and sulphocyanide of ammonium question then took place, and a general opinion was expressed that sulphocyanide of ammonium should be scheduled as a poison.

Mr. Thompson expressed the opinion that carbolic acid would soon be so scheduled.

The Draft Pharmacy Act Amendment Bill was then read, and a discussion took place thereon, after which the meeting ended.

# Scottish Transactions.

## EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The annual business meeting of the sixteenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, April 18, at 9.15 p.m., Mr. Alex. J. Dey, President, in the chair.

The minutes of last meeting were read and approved.

The Secretary read the report of the Prize Committee on the "Ewing" Pharmacy Prize competition, and Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch, presented the prizes as follows:—Ewing Pharmacy Prize to William F. Martin, 21, Duke Street (Attfield's 'Chemistry,' Prantl and Vines' 'Botany,' and Bentley's 'Systematic Botany'); Mr. Aitken's prize to John Harris Burns, 73, Princes Street (Prantl and Vines' 'Botany,' and Bentley's 'Materia Medica'); Mr. Crowden's prize to James Lennox, 48, Haymarket Terrace (Squire's 'Companion').

Mr. Laidlaw Ewing, in presenting the prizes, said personally he would have liked to have seen the name of his esteemed and lamented friend, the late Mr. Ainslie, retained in connection with this prize, for he was worthy of all honour, and it would have tended to keep his memory always green among them. He had great pleasure in being present to hand these prizes to the successful competitors, and he very cordially wished this Association success in its work.

On the motion of the Chairman a very hearty vote of thanks was awarded to Mr. Ewing for his kindness in offering this prize, for the many occasions on which he had shown his great interest in their work, and for his presence at the closing meeting of the session to present the prizes.

The Secretary was also instructed to convey the thanks of the Association to Messrs. Aitken and Crowden.

The Secretary and the Treasurer then read the annual report and financial statement. The former showed a slight decrease in membership, but was otherwise satisfactory, and the latter showed a balance of £5 11*s*. 5*d*. As usual, the Association voted a sum of £1 1*s*. to the Benevolent Fund of the Pharmaceutical Society.

The following office-bearers were elected for the ensuing year:—President, Alexander Sutherland; Vice-President, J. Macintosh Cameron; Secretary, James McBain, 20, West Maitland Street; Assistant-Secretary, David Whyte; Treasurer, Alexander Murray, 139, Princes Street; and as members of Committee, Messrs. Burns, Center, Cowie, Dey, Hay, Lyon, Martin, and D. S. Murray. Messrs. Cowie, Dey, and MacEwan were elected members of the Prize Committee.

The meeting closed with a hearty vote of thanks to the retiring office-bearers.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### POWELL'S BALSAM APPEAL CASE.

*Pharmaceutical Society of Great Britain* v. *Armson.*

In the Queen's Bench Divisional Court, on Thursday, April 26, before Justices Charles and Bruce.

This was an appeal from a decision of the judge of the County Court at Derby. Mr. Bonsey appeared for the appellant; Mr. Crump, Q.C., and Mr. Grey for the respondent.

### COUNSEL FOR THE APPELLANT.

Mr. Bonsey: If your Lordships please, this is an appeal by the defendant in a case which was tried in the County Court at Derby. It was an action brought by the Pharmaceutical Society against the defendant, Mr. Armson, to recover a penalty under the Pharmacy Act of 1868 for keeping open a shop for the retailing and dispensing and compounding of poisons, to wit, morphine, morphine being a preparation of opium, a poison within the meaning of the Pharmacy Act, and contained in and forming part of the ingredients in a compound called Powell's balsam of aniseed. The judge found for the plaintiffs for a penalty of £5, and this is an appeal against that decision by the defendant. The short point really is this: whether a proprietary medicine which contains, in a very small quantity, one of the poisons which is in the schedule to the Pharmacy Act, 1868, is a poison within the meaning of that Act, and whether the sale of such a medicine subjects a person who is not a chemist to a penalty.

Mr. Justice Charles: Will you refer me to the Statute, please?

Mr. Bonsey: It is the Pharmacy Act of 1868, 31 and 32 Vic., cap. 121, and section 15 is the one under which the plaint is issued: "From and after December 31, 1868, any person who shall sell or keep an open shop for the retailing, dispensing, or compounding of poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist, not being a duly registered pharmaceutical chemist, or chemist and druggist, etc., shall be liable to pay a penalty of £5." It is necessary just to refer to the previous sections. In the first place, section 1 says, "It shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title chemist and druggist, or chemist or druggist, etc., unless such person shall be a pharmaceutical chemist, or a chemist and druggist within the meaning of this Act." Then, in section 2, "The several articles named or described in the schedule (A) shall be deemed to be poisons within the meaning of this Act, and the Council of the Pharmaceutical Society may from time to time" add to that schedule.

Mr. Justice Charles: Which is the article which is alleged to be a poison?

Mr. Bonsey: The article is morphine. This schedule in the Act has been added to subsequently by the Pharmaceutical Society. The schedule to the Act is divided into two parts, and morphine is in the second part—morphine and preparations of morphine. I refer to that for this reason, that it was necessary to know that in order to understand section 17.

Mr. Justice Charles: What was it you said?

Mr. Bonsey: That there are two parts; the schedule is divided into part 1 and part 2, because the restrictions upon the sale of the poisons in part 1 are different to those applying to poisons in part 2. If a poison is in part 1 a chemist can only sell it to a person he knows, or to someone who is introduced by a person he knows, and he must enter in a book the name and quantity of the article sold, the name and address of the person to whom it is sold, and the purpose for which it is required. That is part 1. A poison in part 2 he can sell to anyone. There is rather more restriction placed upon the poisons in part 1 than there is in part 2. Section 17 deals with that which I have just been stating. It says, "It shall be unlawful to sell any poison either by wholesale or retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word poison, and with the name and address of the seller of the poison; and it shall be unlawful to sell any of those which are in the first part of schedule A," except as before stated. Several of these cases have been tried before, and the contention between the Pharmaceutical Society and the persons whom they summon is simply this. My learned friend will say that any compound which contains as an ingredient one of the poisons in the schedule, in any quantity, is an article within the meaning of the Act, and can only be sold by a chemist. On the other hand, the contention is, in the first place, that the Act does not apply to a compound in which only one of the ingredients is a poison, but it only applies to the sale of poisons in their simple state. That has been decided against me in a case I shall refer to. But even if the Act does apply to a compound in which one of the ingredients is a poison, then it can only apply when that compound is itself a poison, that is to say, when so great a quantity of poison enters into that compound that the compound itself may be said reasonably and fairly to be a poison. The point is of importance in this way—

Mr. Justice Charles: Did the judge give a written judgment?

Mr. Bonsey: Yes. Shall I read the written judgment?

Mr. Justice Charles: If you please.

The learned counsel then read the judgment (see *Pharm. Journ.*, *ante*, page 768). The point where the learned County Court judge says that in his opinion it is a question of fact (see p. 769)—

Mr. Justice Charles, interposing, said: Is not that true?

Mr. Bonsey: No, my Lord, I submit you cannot say it is a pure question of fact, unless you have a definition of what a poison is within the meaning of the Act. A great difficulty has been felt, I think, in giving a definition in these cases, to come to a definition within the meaning of the Act. Of course if there is a legal definition of a poison it is simply applying particular facts to that; but I do not think it can fairly be said to be a question of fact. I think you will see in a moment that a difficulty has arisen on this point, when you look at the Act. I mean that in determining the question of fact there are questions of law to be taken into consideration, and I submit that the learned judge has not applied those considerations to the facts in this case, so that it really does make it a question of law, and it is impossible to say that this is solely a question of fact. [The learned counsel then concluded reading the judgment]. Now, my lords, in Piper's case, which is in 1 Queen's Bench Division, 1893, page 687 (*Pharm. Journ.*, lii., 679), there was no question that if anybody had taken the whole bottle of chlorodyne it would have had a fatal effect.

Mr. Justice Charles: You must allow me to interrupt you for a few minutes on business connected with the Division.

Mr. Bonsey (resuming): My Lords, I was just going to refer shortly to Piper's case, in the first place for this reason. I should desire, of course, to argue in this case that as a matter of fact the Act does not apply to the sale of a poison, except in its simple state —that it does not apply when it is merely one of the ingredients of a compound; but I know there is a decision of the Divisional Court against me, and therefore I merely take the point, in the event of its going any further.

Mr. Justice Charles: Can it go further?

Mr. Bonsey: Only by leave.

Mr. Justice Charles: Even by leave?

Mr. Bonsey: It is not a criminal case, my Lord; it is from the County Court.

Mr. Justice Charles: It is a penalty.

Mr. Bonsey: They gave leave in Piper's case.

Mr. Justice Charles: I daresay that may be.

Mr. Bonsey: In Piper's case they gave leave to appeal, though in that case the defendant did not pursue it.

Mr. Justice Charles: However, sitting here, of course we are bound by the decision of my brothers Lawrance and Collins.

Mr. Bonsey: Yes, my Lord. I merely mention it. I would not take up the time of the Court by arguing it. I would only just say with regard to this point that a difficulty really does arise in giving an interpretation to the Statute, since the decision that it does apply to an ingredient is only arrived at by an inference from section 17. There is no express provision in the Act that it shall apply to a compound containing an ingredient which is a poison.

Mr. Justice Bruce: Is it not perfectly obvious that section 17 would be quite useless unless it applied to compounds?

Mr. Bonsey: No, my Lord; because, as a matter of fact, if it does apply to a compound, the effect is to almost entirely stop the sale of these proprietary medicines, even by chemists.

Mr. Justice Bruce: Unless they are patent medicines.

Mr. Bonsey: As a matter of fact, my Lord, patent medicines scarcely exist now at all. In Piper's case we tried to argue that a proprietary medicine came within the term "patent medicine," and that patent medicine meant the same thing; but the Court decided otherwise. Proprietary medicines have really taken the place of patent medicines.

Mr. Justice Bruce: That would be a very good reason for extending the exemption to patent medicines. Of course, where a patent was granted, before the granting of the patent some authority would consider the composition of the medicine.

Mr. Bonsey: That would be one view; but, on the other hand, it was suggested that there was great opposition when the Bill was before the House, by the proprietors of patent medicines, and they got it put in for their protection. That point was decided in the other case, and is not raised in this case. But what I mean is this. If it applies to a compound of which one ingredient is a poison, that really stops the sale of proprietary medicines, for this reason, my lord.

Mr. Justice Charles: Where is the protection for patent medicines?

Mr. Bonsey: I think in section 16, my Lord: "Nothing hereinbefore contained shall extend to, or interfere with, the making or dealing in patent medicines." In Piper's case there was really very strong evidence to show that "patent medicine" probably included proprietary medicine, and meant the same thing. Mr. Justice Collins took that view for some time, and almost reluctantly gave it up, because he seemed to think at first that it was so, but that is not raised now. The point is this, and I wish to make it clear at once, especially after what Mr. Justice Bruce said a moment ago. If the construction put upon the Act by the County Court judge be correct, and the Act applies to a compound of which one of the ingredients is a poison, it prohibits the sale of proprietary medicines for this reason, that by section 17 a poison can only be sold under certain restrictions, and it can only be sold by the chemist entering the ingredients in a book. Now no chemist, or scarcely any chemist, knows the contents of these proprietary medicines. The very fact of their being proprietary medicines shows they are secret preparations, or as they are called in the Act, upon which the stamp duty is levied, "secret nostrums," and the chemist himself does not know what the ingredients are. They are sold every day in London and all throughout the kingdom by chemists, and no objection is taken by the Pharmaceutical Society whatever. But the chemist himself, if this construction of the Act is right, is himself committing an offence.

Mr. Justice Charles: Which construction?

Mr. Bonsey: That it applies to a compound of which one of the ingredients is a poison.

Mr. Justice Charles: But now you are attempting to argue Piper's case over again.

Mr. Bonsey: What I mean, my Lord, is this: that argument has equal force with regard to the contention that it applies to a compound of which one of the ingredients is a poison, even in an appreciable quantity; because that is my friend's contention. If there is an appreciable quantity, no matter what the effect of the compound is—whether it will kill an adult by taking it all at once or not—if you once establish that there is an appreciable quantity of poison in that compound, then it is a poison, and can only be sold by a chemist, and if it is a poison contained in part 1 can only be sold to a person whom he knows.

Mr. Justice Charles: That is what Piper's case decided.

Mr. Bonsey: No, my Lord. Piper's case decided only that if the thing itself in its entirety was a poisonous thing, then it was within the meaning of the Act. I submit that the decision in Piper's case is open to the objection that I take now, which was one of the reasons I urged against it; but I do not think Mr. Justice Collins quite appreciated that difficulty, because in his judgment he said it is the easiest thing in the world for a chemist to enter the ingredients in a book. But then it was said, as matter of fact, the chemist does not know the ingredients.

Mr. Justice Bruce: But you will observe that the seventeenth section of the Act, with reference to stating the contents or nature of the article, only applies to poisons enumerated in the schedule.

Mr. Bonsey: Yes.

Mr. Justice Bruce: Mr. Justice Collins in his judgment thinks the Act is wider than the schedule, and that the Act prohibits the sale of a poison, although it may not be within the schedule.

Mr. Bonsey: I did not read Mr. Justice Collins' judgment in that sense.

Mr. Justice Bruce: He certainly says so.

Mr. Bonsey: I do not think he says the Act applies to a poison which is not mentioned in the schedule.

Mr. Justice Bruce: Yes, the particular substance in that case was chlorodyne. Mr. Justice Collins hesitates to say that chlorodyne was a preparation of opium or chloroform.

Mr. Bonsey: Exactly; he hesitates in saying that.

Mr. Justice Bruce: He says even if it was not, it was still a poison. He arrives at the conclusion that although not a preparation of opium, and although not a preparation of chloroform, yet still it is a poison within the Act.

Mr. Bonsey: With very great respect, I submit not.

Mr. Justice Bruce: That is what he decides.

Mr. Bonsey: What I argued was that what they sold in that case was not a preparation of opium, but it was chlorodyne. That may be so, says Mr. Justice Collins, but nevertheless it contains, and the principal ingredient really is, a preparation of opium, therefore I call it a poison within the Act. That is all, I submit, that Mr. Justice Collins meant.

Mr. Crump: He says something different at page 696. What you lordship has just been saying, he says very clearly.

Mr. Bonsey: I was going to read that in a moment. What I submit with regard to Piper's case is this, that it was confined, and carefully confined, by Mr. Justice Collins, to the facts of that particular case, and avoided laying down any principle by which a general construction of the Act might be obtained; because, at page 696, he says this:—"The view of that learned judge, therefore, seems to have been that the Act applied to the sale of a compound which was made up in part of a scheduled poison, and it seems to have been necessary to his decision that he should entertain that view;" it is a distinct authority for the proposition which I am now laying down. "When that proposition is once established, the question of whether there is more or less of a scheduled poison in the compound is not one that has any logical bearing on the question until we arrive at the principle *de minimis non curat lex.* But it is not necessary for us to lay down any principle of universal application, or any principle beyond that which applies to this particular case, for there cannot be the faintest doubt that in the present case a scheduled poison constituted a very considerable factor in the composition of the article sold."

Mr. Justice Charles: That is what the decision is, that if you sell a compound in which a considerable and appreciable factor is one of the scheduled poisons, then the Act applies.

Mr. Bonsey: Then the answer to that is, what is a poison? There is extreme difficulty in defining what a poison is, for this reason, that there are numerous things which may or may not be poisonous according to circumstances. There is a difficulty in this way, that the effect of any substance administered depends really on three things: the quantity taken at one time, the frequency with which it is taken at intervals, and the state of the person who takes it. There are numbers of things which are taken every day, and which are most beneficial, and are taken for food in the ordinary way, which if taken in excessive quantities, or if taken when a person is suffering from illness, would have a fatal effect. Therefore it is impossible to say that a thing is in itself a poison because a certain quantity administered to a person in a certain condition would have a fatal effect. My Lord, that is the difficulty which is felt in dealing with all these cases. If it is merely enough to show that there is an appreciable quantity, then I say Delve's case decides against that proposition. I may say that the facts in Delve's case really were raised for the express purpose of having that point decided, and the quantity was carefully kept out of the case before the County Court judge in order to have it decided whether the contention of my learned friend, that merely an appreciable quantity was sufficient to make the compound a poison within the Act, was correct. There the facts were the analyst found morphine, but did not estimate the actual quantity. "It was not a trace, it was more; he was not instructed to take the quantity; it might be that the quantity was one-fiftieth of a grain per ounce, three-fiftieths in the bottle. I am not prepared to say whether taking the whole of the contents of the bottle would do an adult any harm." Now how can you draw a distinction between one-fiftieth of a grain and one-tenth, or between one-fiftieth and one-fortieth? I mean if my friend's contention is right they would have only to show an appreciable quantity of poison in the compound, and then, with every respect, the decision in Delve's case would not be correct, or at any rate one would have expected Delve's case to be decided the other way.

Mr. Justice Charles: No. The head-note to Delve's case, I think, correctly represents the legal effect of the decision. The County Court judge did not find himself able to find that there was an appreciable quantity of poison in the compound, and that being so we felt it impossible to say that he was wrong in deciding for the defendant. It only decides the proposition that merely proving that some of the scheduled poison is in the compound is not enough

You must go further, and it must be an appreciable quantity.

Mr. Bonsey: Then, my Lord, the difficulty arises: What is an appreciable quantity?

Mr. Justice Charles: That, as the County Court judge says, is a question of fact.

Mr. Bonsey: I submit he has to find, if it is a question of law, that the whole thing in its entirety, as said by Mr. Justice Collins in Piper's case, is a poison.

Mr. Justice Charles: This is a liquid, I suppose; but it does not matter whether it be a liquid or a solid. The compound is made probably altogether, and then it is divided into pills or put into bottles.

Mr. Bonsey: The thing purchased is an ounce bottle, containing, according to analysis, six or seven ingredients. One of those ingredients is one-tenth of a grain of morphine.

Mr. Justice Charles: And that, according to the notes of the evidence, can, and sometimes does, prove fatal to a child.

Mr. Bonsey: It might, but so might a teaspoonful of brandy. You might reduce the thing to an absurdity. As a matter of fact, according to the British Pharmacopœia, which was produced, and evidence given about it, the medicinal dose prescribed is over one-eighth of a grain—half a grain for an adult—and of course morphine is a thing which is administered medicinally with very beneficial effects, according to the quantity and the state of the person. But if you were to say simply because it contains one-tenth of a grain that it might under certain circumstances be fatal, then I say numerous things might under certain circumstances be fatal to an infant of very tender years, or suffering from any disease. But it is not suggested in this particular case that even if an adult took the whole bottle at once that it would have done him the least harm.

Mr. Justice Bruce: Suppose the bottle had contained two ounces of the same liquid; do you draw any distinction?

Mr. Bonsey: No, my Lord, I should not, because what I say is this—that you ought to have regard really to the doses in which it is administered. These things are sold with directions. But of course here it is a penalty, and we are dealing with the particular thing sold, and they say that thing which is sold is a poison within the meaning of the Act.

Mr. Justice Bruce: Take such a poison as oxalic acid, which I suppose is not poisonous in very small quantities. You may have more than a trace, possibly a grain of oxalic acid in a quantity of liquid. I suppose that probably in that weak solution it would not operate as a poison; but if you have a teaspoonful of oxalic acid in the liquid, it probably would be poisonous. How is the judge to decide that, unless it is a question of fact in each case?

Mr. Bonsey: Is it to be said that the definition of a poison depends on the quantity sold? If it does I submit that that is not a correct definition of a poison at all. I can find no definition of that kind in any book of authority, or in any medical book of authority. They all point out the difficulty of finding any definition, but they all point out also the error of assuming that a measure of quantity is to be taken as the definition. If you apply that, you can apply it to alcohol, and to various things that are taken for food, and you will have the same result. If a person desires to poison himself by taking wine or spirits he can do so, especially children.

Mr. Justice Bruce: It is an element in the definition of a poison. No doubt it is difficult to define it, but surely the ordinary word poison means a thing which is fatal to life when taken in small quantities.

Mr. Bonsey: It is the popular definition.

Mr. Justice Bruce: The ordinary use of the word in the English language.

Mr. Bonsey: The popular definition, although it is convenient, is never, I think, admitted by medical men.

Mr. Justice Bruce: It is the meaning the word commonly has in the language. Salt, I suppose, is a poison if you take enough of it, but no one calls salt a poison.

Mr. Justice Charles: You see the learned County Court judge appears to have accurately appreciated what Piper's decision is. The decision in Piper's case did not decide that the presence of a mere trace made the compound poison if that compound itself was harmless.

Mr. Bonsey: The thing which in its entirety was a poison.

Mr. Justice Charles: The learned judge so says. He correctly appreciates what Piper's case decides namely, that the Pharmacy Act applies to compounds where one of the ingredients of the compound is a poison, and where the character of the compound is itself poisonous. In Piper's case he says the Court was of opinion that the compound was injurious if taken all at once. In this case he says: I do not think that the evidence has established that the contents of the bottle if taken at once would ordinarily be fatal, or even injurious, to adult life, but in the case of children, if taken all at once, it would, or might be fatal.

Mr. Bonsey: Is that the proper interpretation to be given to the word "poison" in the Act?

Mr. Justice Charles: It seems to me he had no alternative but to give that interpretation. The question is whether the fact that it is poisonous if taken all at once, by any one of the class of persons for whom it was intended, constitutes it a poisonous thing.

Mr. Bonsey: If that is to be the accepted interpretation of the word "poison" in the Act, it does seem to me to lead to absurdities, because you can apply it to so many things where poison, or some of the poisons mentioned in the schedule, enter into it, but are never regarded in the least degree as poisons, but as articles of food. Your lordships will see that the Pharmaceutical Society has power to add to this schedule, and has added to it from time to time.

Mr. Justice Bruce: That is with the consent of the Privy Council.

Mr. Bonsey: The list has been very much supplemented, since they can sweep into the schedule of the Act almost everything which can by interpretation be possibly said to be of a poisonous character, and therefore they can prohibit the sale of them. The chemist cannot comply with the provisions of the Act in the case of the sale of poisons.

Mr. Justice Bruce: That depends upon whether the poison may not altogether be outside the schedule of the Act. You say that a chemist cannot comply with the Act in the case of all poisons.

Mr. Bonsey: Certainly not. It is a very strong argument in my favour that the only way the decision in Piper's case could be arrived at was by giving to the word "article" in section 17 one meaning, and then giving two meanings to the same word in the same section. It is a startling thing to give a word a different meaning in the same section, and unless you do so, you cannot support the decision in Piper's case.

Mr. Justice Bruce: How are the penalties enforced—is it in the ordinary way under Jervis's Act?

Mr. Bonsey: No, my lord, they are sued for in the County Court.

Mr. Justice Bruce: When a penalty is ordered to be paid and is not paid, what happens?

Mr. Bonsey: It is recovered by execution under section 15. Under section 17 the penalty is recovered in a court of summary jurisdiction.

Mr. Justice Bruce: How are the penalties now in question recoverable?

Mr. Bonsey: By proceedings in the County Court.

Mr. Justice Charles: You say the penalties now in question are recoverable in the County Court?

Mr. Bonsey: Yes, my Lord. If the learned County Court judge's interpretation be correct, and it is merely sufficient to show some appreciable quantity——

Mr. Justice Charles: That is not his judgment at all. His judgment is that it is not sufficient merely to show an appreciable quantity, but you must go on to show that the compound itself is poisonous.

Mr. Bonsey: That it might poison an infant. He finds it would not poison an adult if taken all at once, but it might an infant, and I say when you get down to what might poison an infant, it seems there is scarcely anything which would not poison an infant, if given in excessive quantities. If such a definition of poisons is to be given and is to be the governing definition to this Statute, then the effect will be to stop the sale of all these proprietary medicines, which are admittedly useful in the case of poor people, who may live miles away from a chemist's shop. Even if they lived near a chemist's shop they could not procure them, because the chemist would have to commit an offence under the Act before he could sell them. If I went into a shop where I was not known, and asked for a cough lozenge, if it contained a fiftieth part of a grain of morphine, which, under certain circumstances, might kill an infant a day old, then the chemist cannot sell me that. I must first get someone who knows the chemist and knows me; I must tell him what I want it for, and he must take out his book and enter the ingredients of the cough lozenge, which he cannot do if it is not made by himself, but is a proprietary medicine. I submit that to put that interpretation upon the Act does reduce it to an absurdity, and cannot have been the intention of the Legislature. The Legislature cannot have intended to have restricted the sale of proprietary medicines—which it has encouraged, and from which it has derived a revenue by levying a stamp duty upon them. I think when the Act was passed the difficulty was never thought of.

Mr. Justice Charles: Probably that is so. It is a matter with reference to which the Legislature should probably interfere.

Mr. Bonsey: I think the more one looks at it and considers it, the more it seems to be clear that the persons who were responsible for this Act and the Legislature must only have contemplated the sale of poisons in their simple state, that is, the sale of poisons in the schedule, and if they had intended it to apply to a compound of this kind, they would have expressly said so. It cannot have been present to their minds that this construction should be put upon it, and consequently the sale of all the proprietary medicines be prohibited, which must be the case if the definition of the word "poison" is to be anything which, if taken in excessive quantities, might possibly kill an infant.

[Their Lordships conferred].

Mr. Bonsey: The difficulty appears to be this, how can you define the difference between the appreciable quantity and the poison.

Mr. Justice Charles: You cannot. It is a question of fact in each case whether the compound is poisonous or not. That is the true answer.

Mr. Bonsey: If that be so, the thing in its entirety in this case is not a poison.

Mr. Justice Charles: No. The County Court judge has found that the thing in its entirety is a poison. He says if taken by a child in ordinary health it would certainly be injurious, and might be fatal, and to an infant very probably fatal.

Mr. Bonsey: He says one-twelfth of a grain is the smallest quantity recorded as having proved fatal. That depends on whether the child was suffering from disease.

[Their Lordships conferred].

Mr. Bonsey: If it is a question whether the thing in its entirety is a poison, there is no evidence of that whatever beyond the fact that one of the ingredients happens to be one-tenth of a grain of morphine.

Mr. Justice Charles: Yes, I have read the evidence through, and it is clear it was injurious to a child.

Mr. Bonsey: No; that is with regard to morphine. There was not a particle of evidence that the balsam of aniseed was injurious at all. There was no evidence to show that it ever had been administered to a child with injurious effects. The whole of the evidence was confined to morphine itself.

Mr. Justice Charles: It is not so, I assure you.

Mr. Bonsey: With great respect, my Lord, I cannot recollect any medical man saying so.

Mr. Justice Charles, reading from the evidence of Dr. Luff: "If the whole contents of the bottle were taken at once by a child in ordinary health it would certainly be injurious, and might be fatal."

Mr. Bonsey: That is as to morphine. They did not say they had experimented on animals with Powell's balsam of aniseed. It was merely on the assumption that it contained a tenth of a grain of morphine. That is what he really meant. As a matter of fact it may, and probably would be, that the effect of taking a tenth of a grain of morphine in a fluid ounce with other ingredients would be to act as an emetic, and would not kill the child. They should have given evidence that the thing itself which was sold was a poisonous thing. I need only add this, that some further attention ought to be given, and that weight ought to be given to the directions for use on the bottle as to the object and purpose with which the thing is sold. According to the directions on the bottle it is not sold for infants. There is no dose for a child under four years of age, and it cannot be suggested that, if taken according to the directions on the bottle, it could be in the least degree injurious to a child, or to any other person. I say this stuff has been sold for a great many years, and they did not bring forward any fatality or injury arising through the sale of this particular mixture. It was merely confined to evidence of the effects of morphine in its simple state. I say that the definition of "poison" given by the learned judge is a great deal too limited, and that upon that ground the decision is wrong.

### JUDGMENT.

Mr. Justice Charles: In the view which I take of this case, it really is decided by the two cases which have already been adjudicated upon in the Divisional Court, namely, Piper's case and Delve's case. In Delve's case—taking the last case first—it was decided that it is not enough to warrant a conviction under the 15th section of the Pharmacy Act, 1868, simply to prove that a compound medicine contains an infinitesimal quantity of one of the poisons mentioned in the Pharmacy Act. That alone is not enough. In Piper's case it was decided that a compound, an article containing many ingredients, may be within the provisions of the Pharmacy Acts if it contains poisonous ingredients within the meaning of those Acts, and, further, if the compound itself may properly be found to be a poisonous thing. That is the effect of those two decisions, and the learned County Court judge, in my opinion, most accurately appreciated their effect. He says this: "This case does not decide"—(that is, Piper's case)—"in the plaintiffs' favour the proposition for which they contend, that it is sufficient to show that the compound contained, as an ingredient, a scheduled poison irrespective of the character of the composition as a whole. On the other hand, it precludes the defendant from successfully contending, at any rate in this court, that a compound which, as a whole, does not fall within any of the descriptions in the schedule, is therefore not within the Act if, on the other hand, it is shown to contain a scheduled poison and to be in its entirety a poisonous thing." The question, therefore, is whether there was any evidence to warrant the county court judge in holding that this balsam of aniseed is in its entirety a poisonous thing. Now it contains a small quantity — one-tenth of a grain—of morphine. Evidence was given before the learned county court judge that for an adult person to take the whole of this dose it might be injurious, but so far as its effect upon adults is concerned, he found that point in favour of the defendant. He says, "I do not think that the evidence established that the contents of the bottle if taken at once would ordinarily be fatal, or even injurious, to adult life." But then he goes on to another finding, which there is ample evidence to support, that in the case of children, however, it was stated, "If the whole contents of the bottle were taken at once by a child in ordinary health it would certainly be injurious, and might be fatal, and to an infant very probably fatal." He adds that the directions for use upon the bottle show it is intended for use among other persons. His finding is this, that if the whole were taken at once by one of the classes for whom the preparation is intended it is, in its entirety, a poison. Mr. Bonsey invites us to say that there is no evidence to support that finding. He must say there is no evidence; for if there was evidence to warrant the learned county court judge in coming to that conclusion we cannot upset his finding. He says there was no evidence to support it, and he points to the directions for use which prescribe the dose, and says if the directions were followed it would not be injurious even to children. I cannot, with respect to him, follow that argument. The question is: Is this thing which has been handed to us, in its entirety a poisonous thing? The answer is: Yes, if the whole of it is taken by one of the classes for whom it is intended. It is impossible to rely on the fact that, if taken in accordance with the directions printed on the outside of the bottle, it would not be necessarily injurious. I am unable, therefore, to agree that there was no evidence to warrant the learned county court judge's finding, and as he has found, first of all, that there is one of the ingredients mentioned in the Pharmacy Act, and, secondly, that in its entirety the preparation is an injurious thing, there is no alternative, having regard to the state of the authorities, but to confirm his judgment.

Mr. Justice Bruce: I am of the same opinion. The question was a question of fact for the learned county court judge. There was abundance of evidence before him to justify him in coming to his conclusion, and I think we ought not to disturb it. With regard to the argument which has been addressed to us, that great inconvenience may arise to the public from restricting the sale of proprietary medicines, I must own that I am not much impressed with it. It is much more important to the public that incompetent persons should be restrained from dealing in poisons. It is quite contrary to all one's experience to suppose that a dangerous drug is likely to be rendered innocuous if administered according to the instructions put upon the bottle. One's experience is that these instructions are constantly neglected. I think it is very necessary that the public should have the protection which the Act intended they should have.

Mr. Bonsey: Would your Lordships give me leave to appeal? The point was not taken to appeal in Piper's case.

Mr. Justice Charles: Do you want the opportunity of arguing this case without being fettered by the decisions?

Mr. Bonsey: Yes, my Lord. The judges in the court below gave leave in Piper's case, but the defendent did not not take it further. I was not able to argue that point in the court below.

Mr. Justice Charles: We will give you leave to appeal. I do not feel at all certain that you can appeal, but so far as our leave goes you can have it.

Mr. Crump: This appeal will be dismissed with costs?

Mr. Justice Charles: Yes. Mr. Bonsey, it might be worth your while to look at Black *v.* Beech, 2 Exchequer Division.

Mr. Bonsey: I am much obliged to your Lordship.

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## RECENT POISONING CASES.

### Deaths from Carbolic Acid Poisoning.

In the House of Commons on Friday, April 20, Mr. Macdona asked the Vice-President of the Committee of Council if he was aware that there had been about fifty deaths arising from carbolic acid since the commencement of the year; and whether he would take steps to lessen the temptation to commit suicide by the use of carbolic acid.

Mr. Acland, in reply, said the Registrar-General could not give the number of deaths from carbolic acid, but forty-two deaths had been reported in the *Pharmaceutical Journal* since the beginning of the year. It was not expedient to place an article like carbolic acid, that was so largely used for disinfecting and other purposes, under the restrictions of the Pharmacy Act, which would confine the sale exclusively to chemists and druggists, but the Government was considering whether some amendment could not be made in the law by which some precautionary regulations might be applied to the sale of carbolic acid and other poisons. He was afraid that no law would restrain persons from committing suicide, but deaths from the accidental use of such compounds might probably be lessened by means of legislation.

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Mr. R. B. Johns, coroner of Plymouth, on April 19, investigated the circumstances attending the death of Mary Coath, aged 43, at 27, Wolsden Street. Dr. Cormack said when he was called to deceased she was unconscious. By her side was a bottle of carbolic acid. He could not use the stomach pump, as her throat was so bad. Had he been called in the afternoon he believed he could have saved her life. He attributed death to apoplexy, the result of taking poison. The jury returned a verdict of "Death from natural causes."—*Western Morning News.*

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At the Liverpool Coroner's Court, on April 20, before Mr. Sampson, an inquiry was held into the circumstances attending the death of Edith Maud Wood, a domestic servant, aged 28, who was recently out of a situation, and living at the house of Francis Wright, a plasterer, residing at 42, Chester Road, Tuebrook. Francis Wright deposed to the deceased living at his house for the last fortnight. She did not appear low spirited, but would sometimes read cases of poisoning out of the newspapers to witness's wife, and remark that there was nothing in dying by poison. About a quarter to five on the Wednesday morning witness perceived a strong smell of carbolic acid, and found the deceased lying in an unconscious condition.

There was a tumbler by her side containing a small quantity of carbolic acid, and in the same room was found a bottle containing carbolic acid, and labelled as such. The Coroner remarked that the sale of the poison had been quite regular, and he regretted that the regulations were not more stringent, because lately cases of carbolic acid poisoning had been frequent. The jury found that death was due to carbolic acid poisoning, and that the poison was taken whilst deceased was temporarily insane.—*Liverpool Mercury.*

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On April 20, Job John Upton Scarlett, carpenter, Stourbridge Street, Bromsgrove, was found in an unconscious state in an outhouse at the rear of a small shop occupied by him. It was ascertained that the man had been poisoned by carbolic acid, a quart stone bottle of which was found in his workshop. By means of the stomach pump a considerable quantity of carbolic acid was extracted, and other remedies were also tried, but Scarlett continued unconscious, and died about six o'clock. Evidence having been given as to deceased's state of mind, the jury returned a verdict of "Suicide while temporarily insane."—*Birmingham Daily Post.*

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On April 20, Mr. E. Brassey, coroner, held an inquest at the Bouverie Arms, Garden Lane, Chester, regarding the death of Mrs. Hindley, a widow, residing at 73, Garden Lane. Evidence was adduced to the effect that a son of the deceased on returning home on Thursday morning discovered his mother in an outhouse, and she appeared to be very ill. Dr. Parry was immediately summoned, and, applying the stomach pump, was able to remove a quantity of carbolic acid. She lingered until about 10 o'clock on Thursday night, when she died. In a bedroom was found a bottle which had contained the acid, and also a cup in which there was some of the acid diluted with water. Deceased had been complaining of illness during the past three weeks. The jury returned a verdict that she died from the effects of taking carbolic acid whilst in an unsound state of mind.—*Liverpool Post.*

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### SUICIDES BY OXALIC ACID POISONING.

Mr. Coroner Morrison held an inquiry on Thursday, April 19, at the Railway Mission Hall, Garlands Road, Redhill, into the circumstances attending the death of Stephen James Brown. Dr. Spencer Palmer said that he attended deceased in February and March in his illness from pneumonia and pleurisy. He recovered, and was in good health, though he had latterly looked very grave, whereas he was usually very jocular. Witness was called to him on Wednesday morning about seven o'clock, and found him dead in bed. Witness had since made a post-mortem and found the stomach black, and also the passage leading from the throat to the stomach. In the stomach was a small quantity of dark brown fluid, which pointed to oxalic acid poisoning. In his opinion death was due to that. The deceased's silence and actions would indicate some trouble of the mind. The jury returned a verdict of "Suicide during temporary insanity."—*Surrey Standard.*

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An inquest was held at the Bermondsey Town Hall, on April 21, by Coroner Carttar, to inquire into the death of Eliza Webb, a young girl of 18, of 36, Dockley Road, Bermondsey, who had poisoned herself by taking a quantity of oxalic acid, which she procured from a local chemist by the excuse that she wanted the poison for the purpose of cleaning brass. A verdict of "Suicide whilst temporarily insane" was returned.—*Morning Leader.*

An inquest was held by Mr. Coroner Barham at the George Inn, North Town, Taunton, on Friday, April 20, respecting the death of Alfred Boite, aged 50, a cabinet maker, of Elm Parade, Taunton. His wife found him in great agony. He had strength to point to a tumbler, which still contained liquid, but expired in a few minutes. Deceased had not been very well, and had attended to his business in a somewhat irregular manner in consequence. Mr. W. A. Wrenn, chemist, was called to speak as to the contents of the tumbler referred to. The powder was partly dissolved in water, and he proved it to be oxalic acid. The quantity remaining was about seven drachms. He understood that threepennyworth had been bought, which would be about two ounces, and he estimated that the deceased took about an ounce. There was no restriction on the sale of the acid, it being only required that the package sold should be labelled "poison." Witness's assistant told him in the presence of Sergt. Luke that the deceased made an application at his shop in East Street on Tuesday morning for some prussic acid, but he was told that it could not be supplied. A verdict of "Suicide whilst temporarily insane" was returned by the jury.—*Somerset Express.*

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### SUICIDE BY PRUSSIC ACID.

At the inquiry, by Mr. Sidney Hacker, into the death of John Henry Moss, aged 22, employed by Councillor John Taylor, J.P., at the Belgrave Pharmacy, 15, Lucius Street, Torquay, it was shown that on the Monday night he was in good health and the best of spirits, and retired to bed, after having a chat with his employer respecting a meeting which had been held the same evening. Rising soon after six o'clock on Tuesday morning he lit the kitchen fire—Mrs. Taylor being temporarily without a servant—and afterwards joined in a frolic with one of his employer's little daughters, seemingly being in the best of humours. Subsequently, he went to his room, and just before eight one of the children went upstairs to make the necessary arrangements for airing his bed, and found him lying across the bed, dead.

Dr. Richardson said, on April 17, at about 8.30 a.m., he arrived at 15, Lucius Street, and was shown into the bedroom. He first noticed a strong smell of prussic acid. Deceased was lying on his back on the bed, with his head near the wall, and his right leg projecting over the edge of the bed. The mouth was open, the eyes were glassy, and the surface of the body was cold. He had an apron on, but no collar or tie. The bottle was on the wash-stand, together with a glass containing a small quantity of fluid, which smelt of the acid. Deceased had evidently taken the draught, taken one step back, and fallen across the bed. A dose of prussic acid on an empty stomach would cause almost instantaneous death, but with a full stomach it might have taken minutes to kill. Forty-three drops of the liquid had been known to kill, although larger doses had been taken. The acid paralysed the action of the heart. At 6 o'clock he made a post-mortem examination. The body was then livid. On opening the stomach there was a strong smell of acid. The heart was sound, but contained a quantity of dark-coloured blood. The kidneys and spleen were congested, as the result of the poison. The stomach contained very little, but the contents smelt very strongly of acid. There was no doubt that deceased died from a large dose of prussic acid, which he (witness) was satisfied was self-administered. He had known deceased for a long time. On the previous night he made up several prescriptions for him. He was a very reliable young man, and was a good chemist.

The coroner, in summing up, said in the number of cases of suicide which came before him it was very rarely that he found one as obscure as that under consideration. There appeared to be a total absence of motive. There was no doubt that deceased died from the effects of poison, and they were almost forced to arrive at the conclusion that he took the bottle containing the poison from the shop to his bedroom, and there committed the rash act. They could hardly imagine that when he was playing with the children he contemplated taking the poison. Probably it was one of those cases of something suddenly going wrong with the brain, although, as a rule, there were some premonitory symptoms in such cases. The matter was involved in mystery as regarded the motive.

The jury, after some consideration, returned a verdict of "Suicide whilst temporarily insane."—*Torquay Times.*

### Suicide by Morphine and Chloral.

At the Seaford Town Hall, on Tuesday, April 24, an inquest was held on the body of Christian Wynne Hughes-Games, aged 24, of Southdown Villa, Seaford, a surgeon, who committed suicide on April 21. The Rev. Stephen Hughes-Games said the deceased, who was his brother, was in the habit of injecting morphine for sleeplessness, and had also been confined in an asylum. The medical evidence showed that death was due to morphine and chloral poisoning, and the jury returned a verdict to the effect that deceased committed suicide whilst of unsound mind.—*Standard.*

### Death from Overdose of Strychnine.

An inquest was held on April 20, at Holmfirth, respecting the death of Charles Haigh,[*] druggist, Victoria Square, who died on Thursday morning as the result of taking strychnine. The Coroner said the action of deceased was not the action of a suicide. The jury returned an open verdict, expressing the opinion that the poison was probably an overdose taken as a tonic.—*Yorkshire Daily Post.*

### Death after Injection of Morphine.

An inquest was held on April 18, before Mr. Jennings, coroner, respecting the death of Mr. Henry Thornton Williamson Munroe, brass-founder, of Hull and Beverley, who died early on Tuesday morning.

Mr. H. S. Clark, manager for the deceased, stated that Mr. Munroe had been unwell since Friday, and witness was with him more or less until he died on Tuesday morning. No doctor was called in, as it was thought he would come round, as he had done before when similarly affected. Dr. Park gave witness a prescription on Sunday, the medicine being supplied by Mr. Fields, chemist. The latter, on Monday night, was sent for by Mrs. Munroe, and he injected morphine into the deceased to cause him to sleep.

Mr. T. W. Fields stated that he had for some time past made up prescriptions for the deceased. On Monday night Mrs. Munroe asked witness to give her husband a sleeping draught, as he was very restless. He suggested that instead of a draught he should have an hypodermic injection of morphine, and, at her request, he administered one by means of a subcutaneous syringe. The injection was equal to a quarter of a grain of morphine. He remained till the deceased went to sleep.—In cross-examination he stated that he was not in the habit of doing this kind of thing, and it was only under the peculiar circumstances of the case that he did so in this instance. As a chemist, he knew that under certain conditions of the body morphine injected would act as a poison.

Dr. Walker said he was called to see the deceased, and on his arrival he found him dead. He was of opinion that the immediate cause of death was the injection of morphine. Had the deceased not been under the influence of drink the dose would not have had fatal results. He should have hesitated to give morphine to a person who was under the influence of drink.

The coroner said it would be necessary to have a post-mortem examination to ascertain the real cause of death, and the inquiry was adjourned till the 27th inst.—*Hull Daily News.*

### Suicide by Arsenic Poisoning.

On April 17, Mr. Barstow, coroner, held an inquest at Huddersfield on Joseph Ladley Crowther, aged 26, sub-editor and chief reporter on the *Weekly News*, published at Huddersfield, who had committed suicide on the previous day by taking poison. Emily Crowther, the widow of the deceased, said she saw him last alive about half-past eight on Monday morning, when he left home to go to the office, and he seemed as usual, and said he had to go up to see Mr. Brown, the proprietor, and he would be back at half-past nine. He had been very restless on Sunday, and his conduct was unusual. He said his head was very bad, and behaved very strangely. Police-constable Cooker produced a small mug which he said he had shown to several chemists, who said the contents were arsenic. A similar substance was in the vomit in the waste-paper basket. A bottle containing a few drops of laudanum was also found in the stove. Christopher Williamson said that on Monday morning he sold the deceased an ounce of arsenic, the deceased saying he wanted it to poison rats in his house. The jury returned a verdict that the "Deceased committed suicide whilst temporarily insane."—*Daily News.*

## Reviews and Notices of Books.

### Measurement of Light and Colour Sensations. By Joseph W. Lovibond, F.R.M.S.[*]

This work gives an account of a new method of investigating the amount of light absorbed by more or less coloured substances, whether solutions or solids, varying in colour from black to white—that is to say, solutions as dark as ink, or as colourless as distilled water, and solids such as white lead or lamp-black, are examined by measuring and matching the amount of light they transmit or reflect. This is carried out by means of a series of delicately coloured glasses graded into scales of equivalent colour value, which can be arranged in an apparatus giving direct monocular vision to two fields of view, without the aid of lens, prisms, or reflectors, and which is free from the confusing effects caused by side-lights. Such an instrument is called a tintometer; it measures visual rays which are mixed, but no attempt is made to determine the intensity of rays of given wave-length which enter into a mixture. In this respect the method differs essentially from the method of colour photometry employed by Abney and Festing (*Phil. Trans.* 1892); the author, in fact, shows good reason for rejecting the use of the spectroscope. The standard white light of normal purity is such as proceeds from a white mist, as, for instance, a sea-fog, when there is no variation in the colour readings, whether taken from the north, south, east, or west. A standard of whiteness from which departures of light and colour may be measured is pure precipitated calcium sulphate. Both zinc white and white lead exhibit slight colour. This is an indication of the delicacy of this method of measuring tints. It is, however, a curious fact that in measuring liquids of very light colour no notice need be taken of variations of colour in the light used, so long as it is not direct sunlight. The registered measure of a given water is stated to be the same, no matter whether the light is taken from the sky, a light haze, a dense bank of clouds, or reflected from snow. Though the colour sensation changes with each variation in the colour of the light, no change in the measured colour will be observed. This has been tested by passing the light through coloured glasses; in these circumstances the water appears of the same colour as the intercepting glass. The attention of analysts is particularly directed to the record of experiments on pp. 107-110, which were made on waters under different conditions, examined in two-feet strata. The difference in tint of well and river waters, the latter both before and after pollution, the effect of solid particles in suspension, the change in colour effected by distilling or by filtering, and the restoration of the original colour by aërating the filtered samples with carbon dioxide were all accurately measured. In appendices are given some account of the use of the tintometer—for determining carbon in steel by Mr. H. le Neve Foster, for determining ammonia by the Nessler test by Dr. Munro, also on colour as a means of valuing flour.

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[*] This name does not appear on the Register of Chemists and Druggists for 1894.

[*] London: George Gill and Son. Pp. 132. 7*s*. 6*d*.

### FORMULAIRE DES MÉDICAMENTS NOUVEAUX ET DES MÉDICATIONS NOUVELLES POUR 1894. Par H. BOCQUILLON-LIMOUSIN, pharmacien de 1re classe, lauréat de l'Ecole de pharmacie de Paris. Introduction par le Dr. HUCHARD, médecin des hôpitaux. Fifth Edition.*

The fifth edition of this useful little work contains some five hundred articles dealing with the newer materia medica, including abrin, agathin, alumnol, benzonaphthol, betol, dulcin, formanilide, gallobromol, organic extracts (capsular, cardin, cerebral, pancreatic, testicular, thyroid), pental, piperazine, scopolamine, serum (artificial), tolypyrine, uropherin, etc., etc. The book will be found of considerable value by pharmacists who may have occasion to seek for information concerning the numerous recently introduced medicaments, many of which enjoy a fleeting reputation and find no other convenient permanent record.

### THE HEALTH RESORTS OF EUROPE. By THOMAS LINN, M.D. Second Edition.†

In noticing the first edition of this book, a detailed description of its prominent features was given (*Pharm. Journ.*, [3], xxiii., 1022), which holds good generally for the present one. The guide appears to have been well received, and has now been thoroughly revised and brought up to date, anything of importance suggested by competent authorities having been added. An exceptionally useful addition, inserted in a pocket in the cover for handy reference, is a map of Europe on which the names of the various seaside places mentioned are underlined in blue, and other health resorts in black. It is announced that corrections will be made yearly, and the book may be cordially recommended to travellers in search of health.

## Correspondence.

### THE PROPERTIES OF PURE ACONITINE.

Sir,—Mr. P. W. Squire would probably think me discourteous if I did not reply to his letter, although it contains little that calls for any notice from me. He quotes from a lecture given by me a year ago the statement that my colleague, Professor Cash, had found the pure aconitine produced in the Research Laboratory of the Pharmaceutical Society "the most powerful toxic specimen he had ever met with." Mr. Squire wishes to prove that he had previously described in the 'Companion to the Pharmacopœia' for 1890 a commercial specimen which was as toxic as this, and in order to do so he asks Professor Cash in 1893 to compare the toxic power of the specimen of 1889 with that of our pure aconitine. I am not surprised to find that Professor Cash could not detect any appreciable difference between the two specimens. I have nowhere suggested the determination of the toxic or therapeutic action as a test for the purity of aconitine; nor do I believe that our present physiological methods, with which I am well acquainted, are competent to distinguish between different degrees of purity of such an excessively active substance as aconitine, except when the impurities are present in relatively large quantity. It is obvious that the amount of impurity in the specimen described in the 'Companion to the Pharmacopœia' for 1890 was small, and it probably differed but little from the nearly pure alkaloid prepared by the late Mr. John Williams, with which we commenced our work, and which we succeeded in further purifying. Mr. Williams informed me that he had compared his product with other commercial specimens of aconitine, English and foreign, and had concluded that his was the nearest approach to pure aconitine that had been made. Our own experience, recorded last year in a paper entitled "An Examination of some Commercial Specimens of Aconitine," confirmed this conclusion. The only sure test of the purity of aconitine is to be found in an examination of its physical and chemical properties. Before the appearance of the paper by Dr. Ince and myself in 1891, I know of no record in chemical literature of a specimen of aconitine having been produced not only with the high melting point (188°·5 corr.), but with certain other chemical and physical properties which we ascribed to it, notably the dextro-rotation of polarised light. All scientific chemists are well aware that melting point is a trustworthy criterion of purity only when the determination in different cases is made under constant conditions. It is unnecessary for me to say more on this subject, since the method adopted in the Research Laboratory of the Pharmaceutical Society in determining the melting points of aconitine and its derivatives has been fully described in this Journal and in the *Journal of the Chemical Society*. Lastly, I must allude to the ludicrous statement with which Mr. Squire closes his letter. He supposes he has made the discovery that whereas in 1891 I recorded the melting point of aconitine as 188°·5 (corr.), more recently I "have found reason to raise" it to 188°-190°. Well, if I had, the circumstance would have no significance, except perhaps for the uninitiated. As a matter of fact, however, the melting point has not been raised, and only unfamiliarity with chemical methods can excuse Mr. Squire's misunderstanding of the sentence on p. 581 of this Journal. This, of course, is not intended to record the exact melting point of aconitine, but merely to indicate the temperature to which a relatively large quantity of aconitine must be heated in order to separate acetic acid and produce the new alkaloid we have named pyraconitine.

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* Paris: J. B. Baillière et fils. Pp. i.-viii., 1 to 314. 3 francs.

† London: Henry Kimpton. Pp. 332. 2s. 6d.

WYNDHAM R. DUNSTAN.

### THE PHARMACY ACT AMENDMENT BILL.

Sir,—However much the Society may pride itself upon the thoroughness of the instruction given in its School, and however well it fulfils its obligations as an examining board, no one will, I think, give it credit for being much in the way of a legislative bill incubator. The Society has been in labour for so long a period, and has brought forth such a very small mouse, that it does not seem to matter much whether it lives or dies. If so much has been achieved after so many years of deliberation we may expect another decade to pass with a *minus* instead of a *plus* result. For my own part I think it will be a mistake to allow Minor men to become members—not that I do not wish them to have every privilege of membership and representation on the Council—but for the reason that the public will not be able to discriminate between a pharmaceutical chemist and a member of the Pharmaceutical Society, but will, as they have done heretofore, take them to be synonymous. If associates were given similar rights and privileges to members they would be quite satisfied. Should, however, it remain optional after passing the examinations to become connected with the Society, very little good can result from the passing of the present Bill, for the trade wants protection, and the first step towards that can only be the result of true association and combined action, and such combined action can only result when all who are on the Register are associated with the Society, for no other body exists that has any *locus standi*. If, then, it were possible to compel all who are on the Register to pay a registration fee, or in other words to subscribe to the Society, the thing would be done. At present, the few who voluntarily subscribe to the Society have to bear the expense of the registration of all the outsiders. For my part I think this a great injustice that should exist no longer. Further, I feel certain that as Parliament compels the Society to register those who pass its examinations, it would see the justice of the Society's action in seeking to compel those requiring to be on the Register to pay an annual registration fee. I do not know if it would require an Act of Parliament to alter the mode in which the Register is compiled, but as its present form is far from satisfactory or as correct as it should be, it is a matter that should not be lost sight of by the Society.

*Reading.* CHARLES BRADLEY,
*Local Secretary.*

### CONFERENCE MEETING AT OXFORD.

Sir,—In correcting the expression "Christ Church College," the President of the B.P.C. would have been more accurate if he had said that Christ Church is known at Oxford as "The House," rather than "a House." Several *testamurs* lie before me with the expression "Ex Æde Christi." What connection there is between "The House" and the double meaning of "Ædes" I will not venture to say. As an old visitor to Oxford (although the city is not the same to me in term and in vacation) I envy the pleasure of the members of the Conference who will see it for the first time next summer. Among the visitors there may be some who would prefer to be taken by surprise at every turn, but the majority of chemists, being intelligent men, might desire to know something beforehand of the place they intend to visit. Literary instinct will lead a portion to such books as that of Mr. Boase, in the series of "Historic Towns," and to Mr. Andrew Lang's beautifully illustrated "Oxford." I would venture to make the very humble and economic suggestion that any person who is a stranger to the city and university would double his pleasure by making himself acquainted beforehand with "Shrimpton's Sixpenny Illustrated Gossiping Guide to Oxford"—this as the Alpha, and not the Omega of the subject. OUTIS.

### MEDICAL MEN AND PHARMACISTS.

Sir,—Doctors and chemists, from their natural relationship, ought to be, for the interest of the public and themselves, the best of friends. In the matter of health, on which all true happiness and enjoyment of life depends, are the people passive? I say on no subject are they so active, or so keen. The common salute, the first inquiries on the meeting of friends, are on health; and if the weather comes up, it is in relation to ourselves, or the prospective health of our food-stuffs. Close attention and well-noted experience are the common stock; out of this is evolved or differentiated persons who are specially adapted to carry the subject as far as concentrated attention and human wit can. Ontology is not yet an exact science, and the boundary is, alas! soon reached. Now the very first qualification for the physician, chemist, or nurse—I feel inclined to put the last first—is a kind and sympathetic nature; with this you can get a trinity in unity; three functions, and yet one function. For use separately, yet part and parcel of the same fabric; a tower of strength to all "when the sound of the grinding is low." The second qualification is self-denial; if any person enters any of the branches of medicine for selfish purposes, or self-aggrandisement, disappointment will meet the individual, and sorrow stain a noble profession. The health of the people is in its keeping. Each separate branch must ever keep that fact in view. As facts range themselves under the reign of law, and mystery, the imaginative child of ignorance which now demands an erratic providence to explain her whims, fades before order, a state of society may exist in which the three functions of medicine may be sharply defined, at present certainly the people cannot spare the accessible and ready aid of the stationary pharmacist in their little health troubles: the burn, scald, or cut; the tiny grit, coal dust, or insect in the sensitive eye, demand an instant and ready aid; and how often is it given without fee or reward. Is not the pharmacist again and again thanked by the successful and busy practitioner for temporary assistance in minor cases? and if at times this singular aptitude and vast knowledge of remedies fails to diagnose the precise line of danger, is it not often forced by an imperious patient conscious that the presence of the doctor may mean hours of waiting *Nemo mortalum omnibus horis sapit*; but is this to cause friction and unfriendly feeling? No, that is to be found in an overcrowded profession, where the struggle for existence gives an unwholesome narrowness to the mind, and petulance to the temper. It is my deliberate opinion that were the use of drugs and chemicals at the present time confined to the physiologists, anatomists, pathologists, and bacteria and bacillus hunters, medicine as a beneficial agent would gradually die out.

*Enfield.* GEORGE MEE.

Sir,—In the present day at least, the chemist has an undoubted right to a monopoly of the sale of all pharmacopœial medicines, of course reserving the right of medical men, and also providing a schedule of such dietetic articles contained in it as ought to be allowed to be sold by grocers and others. No one ought to be allowed to make or sell any simple or compound medicines except medical men and druggists, and the whole of the patent medicines (so-called) made by unregistered persons ought to be abolished, and the chemist ought to make such simple articles for common ailments as are likely to be required, and to label them, e.g. "Cold and Cough Mixture" (not more than two names are allowed), to simply put on it the dose, without recommending it as for the "Cure or Relief of any Disease," and to take care that any handbill does not do so, and then he need use no "Medicine Stamps" which brings them into the category of quack medicines. In conformity with present ideas on the subject, it would be only proper if they contain any scheduled poison to state their strength on the label, and a caution that they are to be taken according to the directions, and not given to children, when it will be perfectly safe, and as far as possible to confine their sale to his own customers, and not to say "of all respectable chemists." Now to the point. The chemist has passed an examination in which he has been obliged to identify all chemicals, drugs, and preparations, their purity and strength, and, to a great extent, their uses, and he certainly soon finds them out after a few years of dispensing. Of course, he must not pretend or lay himself out to treat diseases, but is he to efface himself on being applied to for a simple remedy for a common ordinary ailment, to refuse to supply it, and tell the person to go to a doctor (which would be a chemist not far off)? The chief question is, does he understand what is the matter and what to give? "There is the rub"; of course any one doctor, or druggist, who does not would be very wrong to attempt it. I do not advocate "counter prescribing," few respectable chemists would, but "they all do it," and if they understood the symptoms of diseases, their recommendation to consult a doctor would be heeded. The custom to consult chemists was on account of doctors keeping open shop, which some do now, and the custom of their supplying the medicine as well as advice; the cure is associated with the medicine, and not the man.

*Reading.* HENRY LONG.

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### A LONDON CLUB FOR PHARMACISTS.

Sir,—May I be allowed a small space in your valuable columns to put forward a suggestion, which methinks may prove of interest to many of the readers thereof. It has often occurred to me, and whenever I have mentioned my views to others connected with the trade, they have been reciprocated, that a substantial good class club for chemists, situated somewhere central in London, would be most highly appreciated by a large proportion of the fraternity. I am not aware that anything of the kind has been previously considered, but if so, should be glad to learn from any who may do me the honour to reply: under what conditions? and with what success? I do not propose to go into detail with regard to the establishment and management of such a club, for I think, as yet, this would be somewhat premature, and even presumptuous on my part; but in justice to my proposition, I feel compelled to very briefly summarise the main objects in view, viz., "to decide upon the headquarters, in London, of those connected with pharmacy, and to offer such accommodation as would induce country members to stay there during their visits to the metropolis; thereby promoting friendly intercourse among members of the trade, and a general good feeling toward the Pharmaceutical Society." I feel sure that with the hearty co-operation and support of some of the well-known members in pharmaceutical circles, a really first-class club might be carried on, with great benefit to us individually and collectively.

G. H. G.

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### ON DISPENSING PERCENTAGE PRESCRIPTIONS.

Sir,—Referring to the paper on this subject by Mr. C. A. Macpherson, in the Journal of last week, I beg to point out that when the term per cent. is used in the B.P. (unless otherwise stated) it means "parts by weight" of one substance in "parts by weight" of another; parts by measure having nothing to do with the case. As an instance, I may quote liquor acidi chromici, which is a 25 per cent. solution of acid chromic B.P. in water, and would be supplied as such by any chemist having a prescription for sol. acid chromic 25 per cent. It is made by dissolving 1 oz. (437·5 grains) in 3 fluid ounces or parts by weight of water; this solution is not directed to be made up to 4 fluid ounces, as would be the case if following the directions given in example 12. In pointing out what I consider to be an error, I may add that when water is the solvent, the difference between the two methods for weak solutions of most salts is small, but when a large percentage is ordered, as a 20 per cent. solution, the difference becomes appreciable. When, however, glycerin or spirit, for example, is the solvent, the difference becomes great; in any case, both substances should be weighed. For instance, to make a 5 per cent. solution of salicylic acid in spirit, take five parts by weight of the acid and add 95 parts by weight of spirit. If an exact quantity of such a solution, such as ℥ii., is required another easy calculation is required. The habit of prescribing percentage solutions is a growing one, and, unless perhaps in the case of hypodermic solutions, it is to be recommended, as it is, or ought to be, easily understood in all countries. Much has already been written on percentage solutions, and although the rule seems to be clear, still it would be interesting to hear the opinions of other chemists upon the subject.

*Harrogate.* E. J. GREEN.

## Answers to Correspondents.

*A. Ball.*—The specimens you send are—1. Guaiacum. 2. Seedlac. 3. Copal.

## Diary of the Week.

MONDAY, APRIL 30.

*Society of Arts*, at 8 p.m.
"Typewriting Machines," by H. C. Jenkins.

TUESDAY, MAY 1.

*Pharmaceutical Society of Great Britain.*
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.
*Royal Institution of Great Britain*, at 3 p.m.
"Rubies," by Professor J. W. Judd.
Annual Meeting at 5 p.m.

WEDNESDAY, MAY 2.

*Pharmaceutical Society of Great Britain*, at 11 a.m.
Council Meeting.
*Society of Arts*, at 8 p.m.
"Nickel," by A. G. Charleton.

THURSDAY, MAY 3.

*Royal Institution of Great Britain*, at 3 p.m.
"The Solid and Liquid States of Matter," by Professor Dewar.
*Chemical Society*, at 8 p.m.
Ballot for the Election of Fellows.
"The Structure and Chemistry of the Cyanogen Flame," by Professor Smithells.
"The Condition in which Carbon Exists in Steel," by J. O. Arnold.
"α-Hydrindone and its Derivatives," by Dr. Kipping.
"Volatile Compounds of Lead Sulphide," by J. B. Hannay.
*Chemists' Assistants' Association*, at 8.30 p.m.
Annual General Meeting.
*Linnean Society of London*, at 8 p.m.
"Notes on the Habits of Certain Species of Lemna," by H. B. Guppy.
"On the Fertilisation of Certain Malayan Orchids," by H. N. Ridley.
*School of Pharmacy Students' Association.*
"Aquatic Plants," by C. E. Ashby.
"Report on Materia Medica," by Miss B. Shove.

FRIDAY, MAY 4.

*Royal Institution of Great Britain*, at 9 p.m.
"Spread of Tuberculosis by Food," by Dr. G. Sims Woodhead.
*Quekett Microscopical Club*, at 7 p.m.
Conversation, and for the Exhibition of Objects.

SATURDAY, MAY 5.

*Royal Institution of Great Britain*, at 3 p.m.
"Colour Vision," by Captain Abney.
*Quekett Microscopical Club.*
Excursion to Enfield from Liverpool Street.
*School of Pharmacy Students' Association.*
Botanical Excursion to Box Hill. Leave London Bridge 2 p.m.

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COMMUNICATIONS, LETTERS, etc., received from Messrs. Coull, Hill, Kemp, Sage, Smith, Umney.

## ANNUAL REPORT OF THE COUNCIL.

The fifty-third financial report of the Society compares favourably with previous years, and indicates the steady progress of the Society.

The record of examination work during the year shows that 126 more candidates entered for the First examination than during 1892. The total number of candidates examined was 1489. Of this total, 50·37 per cent. failed to come up to the requisite standard. Some satisfaction may be derived from the fact that the percentage of rejections is nearly 3 per cent. lower than in the previous year.

There has been a marked increase in the number of candidates presenting themselves for the Major and Minor examinations. For the Minor there were 1189 candidates, as against 871 in 1892, and for the Major 152 entries in 1893 against 140 in the preceding year. The number of rejections in the Minor examination shows no diminution. The percentage of unsuccessful Minor candidates, which in 1891 was 55·08, and rose in 1892 to 58·89, further increased in 1893 to 60·55. It would thus appear that there is still a great deficiency in the systematic training of candidates generally.

Nine candidates presented themselves for the Modified examination during the year, three of whom passed and six failed.

Dr. Stevenson, the government visitor to the examinations, in reporting to the Privy Council on the examinations held in London under the Pharmacy Act during the year ending March, 1894, refers to the public advantage arising from the steady progress in the technical examinations of the Society towards securing for the service of the community chemists and druggists of scientific and practical knowledge.

To the libraries in London and Edinburgh many valuable additions, both of new and old works, have been made during the year. The 14,000 volumes comprising the Society's collections offer facilities to the student of pharmacy and the allied sciences which cannot be equalled in the United Kingdom. The practical utility of the libraries has been further enhanced by the issue of a new catalogue, which includes the books formerly belonging to the late Daniel Hanbury, and presented to the Society by Mr. Thomas Hanbury, as mentioned in the annual report for last year. In the library in London the day attendance was somewhat less than in the previous year, but the evening attendance greater. A large number of volumes were lent during the year to the subscribers to the Society, both in town and country.

The museums of the Society have received large and important donations. A large series of essential oils—many of them very rare—and several of the chemical substances recently introduced into perfumery, have been presented to the museum in London by Messrs. Schimmel and Co., of Leipzig. The herbarium of medicinal plants has been nearly doubled during the past year, owing to the large number of Indian specimens presented by Dr. Geo. Watt, C.I.E., a corresponding member of the Society, supplemented by collections purchased by the Society, and by donations from Dr. Rusby, Mr. J. H. Hart, F.L.S., Dr. Hugo Finck, and Mr. Ridley, M.A., who also are corresponding members. The herbarium of British plants is now nearly complete, having lately had incorporated with it the private collection of the Curator, a fine collection from Mr. F. J. Hanbury, and one from Mr. J. W. White. In the museum used for reference several new cases have been added for the numerous specimens that have been received.

An important change was made in August in the arrangements for teaching materia medica in the School of Pharmacy. In order to place this subject of the pharmaceutical curriculum on a more satisfactory basis, the Council endowed a chair of Materia Medica, and appointed as professor Mr. Henry G. Greenish—who has been for some time successfully engaged in teaching the subject.

The fifty-second session of the School of Pharmacy was inaugurated on October 2, when Dr. Lauder Brunton, F.R.S., Assistant Physician and Lecturer on Materia Medica at St. Bartholomew's Hospital, and honorary member of the Society, delivered an able address to the students upon the advantages of thoroughness in education.

The evening meetings in London and Edinburgh during the past year have fully justified the efforts made to render them successful. The subjects provided have been more than usually interesting and instructive. The Council is greatly indebted to those gentlemen in London and in Edinburgh who have so generously placed their time and ability at the disposal of the Society, and who have, often at personal inconvenience, attended the evening meetings to read papers or deliver lectures.

The Society was represented at the Chicago Meeting of the International Pharmaceutical Congress and American Pharmaceutical Association by the President of the Society (Mr. Michael Carteighe), Mr. N. H. Martin, and Mr. W. Martindale. The warmth of the greeting received by them from the American pharmacists testified to the pleasure experienced at having delegates from the Pharmaceutical Society of the old country.

The Hanbury Medal, which had been awarded to Professor Maisch, was presented at the meeting of the International Pharmaceutical Congress to the president of that Congress, Professor Remington, in the absence, through illness, of the medallist an illness which, to the general regret of all pharmacists, terminated fatally.

The report of the North British Branch, shows the ability and earnestness of the officers charged with the conduct of the business of the Society, north of the Tweed. The additions to the Society's premises in Edinburgh, to which reference was made in the last annual report, are proceeding in a satisfactory manner, and it is hoped that before the end of the year adequate accommodation will be available for all purposes incident to the due fulfilment of the duties of the Society in that part of Great Britain.

The local representatives of the Society in Scotland have been considerably increased, the Council having unanimously adopted the report of the Executive on the subject of the increase of local centres in Scotland. It is confidently hoped that the additional local secretaries will do much to bring the chemists and druggists resident in Scotland into closer union with the Society, and

# GENERAL

## FINANCIAL

### Receipts.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Balance January 1st, 1898:—London and Westminster Bank | 2280 | 2 | 7 | | | |
| In hands of Chairman of Executive (Scotland) | 53 | 11 | 1 | | | |
| | 2333 | 13 | 8 | | | |
| Less—Due to Treasurer | 14 | 8 | 4 | | | |
| | | | | 2319 | 5 | 4 |
| Interest on Investments:—Dividends and Ground Rents | 175 | 9 | 6 | | | |
| Rent of 15, Bloomsbury Square, and of Stable in Edinburgh | 197 | 11 | 0 | | | |
| | | | | 373 | 0 | 6 |
| Subscriptions:—1406 Members, Pharmaceutical Chemists | 1476 | 6 | 0 | | | |
| 606 ,, Chemists and Druggists | 636 | 6 | 0 | | | |
| 1544 Associates in Business | 1621 | 4 | 0 | | | |
| 978 Associates not in Business | 513 | 9 | 0 | | | |
| 801 Students | 420 | 10 | 6 | | | |
| | 4667 | 15 | 6 | | | |
| 25 Life Subscriptions | 262 | 10 | 0 | | | |
| Fees paid upon restoration to the Society | 6 | 14 | 0 | | | |
| | | | | 4936 | 19 | 6 |
| Examination Fees:—1601 First Examination | 2881 | 9 | 0 | | | |
| 8 Modified ,, | 8 | 8 | 0 | | | |
| 1274 Minor ,, | 5380 | 6 | 0 | | | |
| 155 Major ,, | 433 | 15 | 0 | | | |
| | 8703 | 18 | 0 | | | |
| 22 Fees for Restoration to the Register | 23 | 2 | 0 | | | |
| Registration Fees as Chemists and Druggists | 22 | 1 | 0 | | | |
| | | | | 8749 | 1 | 0 |
| Journal:—Advertisements | 3317 | 19 | 0 | | | |
| Sales | 195 | 4 | 8 | | | |
| | | | | 3513 | 3 | 8 |
| Law Costs:—Balance of Account | | | | 28 | 4 | 5 |
| Register:—Sales to the Government | 147 | 10 | 0 | | | |
| Sundry Sales | 18 | 15 | 0 | | | |
| | | | | 166 | 5 | 0 |
| Calendar—Sundry Sales | | | | 27 | 18 | 6 |
| | | | | £20,113 | 9 | 2 |

# FUND.

**STATEMENT FOR 1893.**

## Expenditure.

| | England and Wales. | Scotland. | £ s. d. | £ s. d. |
|---|---|---|---|---|
| Annuity :—Mr. Elias Bremridge | | | | 400 0 0 |
| Carriage of Books and Parcels | | | | 15 10 5 |
| Certificates of Death | | | | 20 3 0 |
| Evening and other Meetings | | | | 56 10 11 |
| Examiners, Boards of— | | | | |
| Fees to Examiners | 1379 17 0 | 680 8 0 | | |
| Fees to Superintendents—First Examination | 211 1 0 | 34 13 0 | | |
| Hire of rooms for conducting First Examination | 72 18 0 | 7 8 0 | | |
| Travelling Expenses | 150 9 10 | 50 0 6 | | |
| Refreshments for Examiners | 44 19 3 | 49 4 7 | | |
| Apparatus, Drugs, and Chemicals for Examinations and sundry charges in connection therewith | 266 3 0 | 72 3 4 | | |
| | 2125 8 1 | 893 17 5 | | |
| (*England and Wales*) | | 2125 8 1 | | |
| | | | 3019 5 6 | |
| Fees to the College of Preceptors | | | 198 12 0 | |
| | | | | 3217 17 6 |
| Fixtures and Fittings | | | | 161 15 9 |
| Furniture | | | | 3 12 0 |
| Gas, Water, Coal, Cleaning Materials, etc. | | | | 362 3 6 |
| House Servants—Wages | | | | 275 7 9 |
| Journal :—Editor and Sub-Editor's Salaries | | | 700 0 0 | |
| Paper | | | 594 16 10 | |
| Printing | | | 2271 7 8 | |
| Publishers' Commission | | | 279 14 0 | |
| Contributions and Engraving | | | 384 11 9 | |
| Reporting | | | 131 4 2 | |
| Attending Conference Meeting | | | 20 0 0 | |
| Parliamentary Papers, and Sundry Charges | | | 88 17 5 | |
| | | | | 4470 11 10 |
| School of Pharmacy :—Emeritus Professor | | | | 100 0 0 |
| Endowment of the Chairs of Practical Chemistry, Chemistry, and Botany | | | 450 0 0 | |
| Lecturer on Practical Pharmacy | | | 50 0 0 | |
| Subscription to Royal Botanic Gardens | | | 21 0 0 | |
| Lecturers' Assistants | | | 103 6 0 | |
| Apparatus, Chemicals, and Specimens for Lecture Classes, Prize Medals, Certificates, etc. | | | 60 18 1 | |
| Printing and posting prospectuses | | | 50 8 3 | |
| | | | | 735 12 4 |
| Library :—Librarian's Salary | | | 250 0 0 | |
| Purchase and Binding of Books | | | 110 14 1 | |
| Librarian attending Meeting of the Library Association | | | 10 10 0 | |
| | | | | 371 4 1 |
| Museum :—Curator's Salary | | | 383 6 8 | |
| Assistant's Wages | | | 51 1 0 | |
| Herbarium Catalogue | | | 66 5 9 | |
| Specimens, Bottles and Sundries | | | 70 14 2 | |
| | | | | 571 7 7 |
| Expenses in Scotland :—Assistant Secretary—Salary | | | 191 13 4 | |
| Taxes | | | 34 16 4 | |
| Travelling Expenses—Members of Executive | | | 25 3 0 | |
| Fuel, Light, Water, Cleaning, Service and Miscellaneous Expenses | | | 202 2 0 | |
| | | | | 453 14 8 |
| Postage :—General | | | 216 17 2 | |
| Journal (Cost of transmission to Members, Associates and Apprentices) | | | 706 16 10 | |
| | | | | 923 14 0 |
| Register—Printing and Publication | | | | 180 5 8 |
| Rent, Taxes and Insurance of Plate Glass | | | | 742 14 1 |
| Repairs and Alterations | | | | 571 0 6 |
| Stationery, Engraving, Printing, and Office Expenses | | | 310 2 7 | |
| Calendar—Printing and Publication | | | 114 16 4 | |
| | | | | 424 18 11 |
| Salaries :—Secretary and Registrar | | | 600 0 0 | |
| Clerks | | | 892 0 0 | |
| | | | | 1492 0 0 |
| Research Laboratory | | | | 429 10 6 |
| Cost of Materials supplied to the Jacob Bell Scholars | | | | 10 0 0 |
| Herbarium and Council Medals, and Sundries | | | | 6 18 7 |
| Travelling Expenses—Council and Committees | | | | 436 1 7 |
| Refreshments for Council | | | | 43 7 5 |
| Balance, December 31, 1893 :—London and Westminster Bank :—Current Account | | | 1478 11 4 |  |
| On Deposit | | | 2000 0 0 | |
| In Treasurer's hands | | | 98 15 11 | |
| In hands of Chairman of Executive (Scotland) | | | 60 0 1 | |
| | | | | 3637 7 4 |
| | | | | £20,113 9 11 |

# BENEVOLENT FUND.

## FINANCIAL STATEMENT FOR 1893.

### CURRENT ACCOUNT.

**Receipts.**

| | £ | s. | d. |
|---|---|---|---|
| Balance Jan. 1st, 1893 :— | | | |
| London and Westminster Bank | 772 | 15 | 5 |
| In Treasurer's hands | 8 | 5 | 11 |
| Interest on Invested Capital and Ground Rents | 931 | 14 | 5 |
| Subscriptions | 1712 | 8 | 6 |
| | £3425 | 4 | 3 |

**Expenditure.**

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| *Annuitants.* | | | | | | |
| 37 at £50 per annum for 4 quarters | 1850 | 0 | 0 | | | |
| 6 at £40 " " | 240 | 0 | 0 | | | |
| 1 at £50 " 2 quarters | 25 | 0 | 0 | | | |
| 1 at £50 " 1 quarter | 12 | 10 | 0 | | | |
| 2 at £40 " " | 20 | 0 | 0 | | | |
| 1 at £40 " 2 quarters | 20 | 0 | 0 | | | |
| | | | | 2167 | 10 | 0 |
| *Grants.* | | | | | | |
| Members and Associates of the Society and Registered Chemists and Druggists (22) | 238 | 0 | 0 | | | |
| Widows of ditto (28) | 330 | 0 | 0 | | | |
| | | | | 568 | 0 | 0 |
| Grant to the Secretary's Casual Fund | | | | 10 | 0 | 0 |
| Printing, Stationery and Postage | | | | 44 | 0 | 3 |
| Law Charges in connection with Ground Rents | | | | 11 | 11 | 6 |
| Balance, Dec. 31, 1893 :— | | | | | | |
| London and Westminster Bank | | | | 609 | 1 | 10 |
| In Treasurer's hands | | | | 14 | 5 | 3 |
| | | | | £3425 | 4 | 3 |

### DONATION ACCOUNT, 1893.

| | £ | s. | d. |
|---|---|---|---|
| Balance, Jan. 1, 1893 :— | | | |
| London and Westminster Bank | 9 | 7 | 6 |
| Sale of £4850 Consols | 4789 | 7 | 0 |
| Loan from the Orphan Fund | 1000 | 0 | 0 |
| Donations and Legacies | 238 | 0 | 0 |
| | £6031 | 14 | 6 |

| | £ | s. | d. |
|---|---|---|---|
| Purchase of £200 2¾ per cent. Consols | 196 | 1 | 6 |
| Purchase of Ground Rents at West Kensington | 5809 | 2 | |
| Balance, Dec. 31, 1893 :— | | | |
| London and Westminster Bank | 26 | 11 | 5 |
| | £6031 | 14 | |

# ORPHAN FUND.

(FOUNDED BY THOMAS HYDE HILLS, 1891).

## FINANCIAL STATEMENT FOR 1893.

| | £ | s. | d. |
|---|---|---|---|
| Balance, Jan. 1, 1893 :— | | | |
| London and Westminster Bank | 1017 | 6 | 5 |
| Donations | 5 | 5 | 0 |
| Subscriptions | 16 | 14 | 6 |
| Interest on Invested Capital | 38 | 11 | 11 |
| Sale of £1000 Consols | 986 | 4 | 6 |
| Sale of Gas Stock | 148 | 12 | 0 |
| | £2212 | 14 | 4 |

| | £ | s. | d. |
|---|---|---|---|
| Purchase of £1150 Consols | 1131 | 6 | 9 |
| Loan to Benevolent Fund—Donation account | 1000 | 0 | 0 |
| London Orphan Asylum (Minett) | 30 | 0 | 0 |
| Balance, Dec. 31, 1893 :— | | | |
| London and Westminster Bank | 51 | 7 | |
| | £2212 | 14 | |

# AUDITORS' REPORT.

**We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society of Great Britain, as presented in the Financial Statement, Benevolent Fund and Orphan Fund Accounts, and find them correct. We have inspected the Deeds relating to the House Property and Ground Rents named below, and also find that the undermentioned Stocks were standing to the account of the Society at the Bank of England, and in the hands of the Society's Bankers, on the 31st December, 1893, viz.:—**

| | | | | | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|---|---|---|---|
| General Fund | 2½ per cent. Consols | | | | | | | 1,000 | 0 | 0 |
| | Freehold Ground Rents at Paddington Green, London, W., cost | | | | 5,551 | 5 | 6 | | | |
| | House in Edinburgh, cost | | | | 1,931 | 10 | 0 | | | |
| | Leasehold Premises:—Galen Place, cost | | | | 10,606 | 10 | 2 | | | |
| | „ 15 and 16, Bloomsbury Square, cost | | | | 9,527 | 5 | 3 | | | |
| | | | | | | | | 27,616 | 10 | 11 |
| | | | | | | | | **28,616** | **10** | **11** |
| Benevolent Fund | 2¾ per cent. Consols | | | | 350 | 0 | 0 | | | |
| | Freehold Ground Rents at Strawberry Hill, cost. | 1,020 | 12 | 6 | | | | | | |
| | Freehold Ground Rents at Battersea, cost. | 12,213 | 0 | 0 | | | | | | |
| | Freehold Ground Rents at Broomwood Park Estate, cost | 7,454 | 7 | 10 | | | | | | |
| | Freehold Ground Rents at West Kensington, cost. | 5,809 | 2 | 1 | 26,497 | 2 | 5 | | | |
| | **St. Paul, Minneapolis and Manitoba Railway 4°/₀ Bond** | | | | 100 | 0 | 0 | | | |
| | | | | | | | | **26,947** | **2** | **5** |
| Pereira Memorial Fund | 2¾ per cent. Consols | | | | **100** | **0** | **0** | | | |
| Bell Memorial Fund | 2¾ per cent. Consols | | | | **2,050** | **0** | **0** | | | |
| Hanbury Memorial Fund | 2¾ per cent. Consols | | | | **400** | **0** | **0** | | | |
| Orphan Fund | 2¾ per cent. Consols | | | | **255** | **0** | **0** | | | |
| | | | | | | | | **2,805** | **0** | **0** |
| **Redwood Memorial Fund** | Great Indian Peninsula Railway Stock | | | | | | | **400** | **0** | **0** |
| **Hills Prize Fund** | Russian Bonds | | | | | | | **316** | **8** | **0** |
| **Manchester Pharmaceutical Association Scholarship Fund** | **Manchester Ship Canal Co. 4 °/₀ Debentures** | | | | 700 | 0 | 0 | | | |
| | 2¾ per cent. Consols | | | | 52 | 4 | 6 | | | |
| | | | | | | | | **752** | **4** | **6** |

EDWARD NORTHWAY BUTT,
F. HARWOOD LESCHER,
S. LLOYD STACEY,
FRANCIS YATES
} *Auditors.*

*March 20th*, 1894.

to strengthen the hands of the Council in its endeavour to promote pharmaceutical interests.

At the meeting of the Council in December last, a report from the Pharmacopœia Committee of the General Medical Council was received. From that report, which was published in the Council proceedings of that date, it will be seen that the Medical Council has decided upon the publication of another edition of the British Pharmacopœia, and that the aid of the Pharmaceutical Society in the compilation of the volume is to be again invited.

Professor Attfield, F.R.S., has been appointed editor of the new edition, which is to be an "Imperial" Pharmacopœia.

The report of the Research Committee for the year shows a record of important work. The complimentary reference to the Research Laboratory in the report of the Gresham University Commission, and the founding of a Research Fellowship of £100 a year by the Salters' Company, indicate the value set by important public bodies outside the Society upon the investigations conducted in the Laboratory.

The following distinguished names have been added to the list of Honorary Members of the Society:—Sir F. A. Abel, Bart., F.R.S., secretary and director of the Imperial Institute; Professor Sydney Ringer, M.D., F.R.S., and Professor J. Remington, Ph.M., of Philadelphia. The roll of corresponding members has been increased by the addition of the names of Dr. G. Watt, C.I.E., Calcutta; and Professor H. H. Rusby, M.D., New York.

During the past year the work of the Council in the administration of the Pharmacy Act has been exceptionally heavy. Not only has the number of infringements of the Act reported been very large, but it has been found that a much greater proportion of the cases necessitated the institution of legal proceedings to enforce compliance with the law.

As a consequence of the interpretation of the law given in the Court of Queen's Bench in February, 1892, with reference to the retailing of proprietary preparations containing poison, a large number of unregistered persons have been reported to the Council for selling such preparations. Every case reported has been dealt with, and proceedings have been instituted in over 200 instances. One of these cases was defended in the Manchester County Court by W. H. Delve (keeper of a drug store), who was sued for a penalty in respect of the sale of a preparation known as "licoricine," which contained morphine. For the defence the principle of *de minimis non curat lex* was urged. The presence of morphine was proved by the analyst, but no evidence was offered as to quantity, the Society's counsel contending that the presence of the scheduled poison was sufficient, and that the law did not make the definition of what was a poison depend upon quantity.

His Honour Judge Heywood, who heard the case, regarded it as essential that he should have evidence of the quantity of morphine contained in the preparation before he could decide whether it came within the meaning of the Pharmacy Act or not. No such evidence being given, he held that the Society had not proved its case. Council took the case to the Court of Que Bench, with a view to having the point of argued fully. The appeal was heard before Justi Charles and Wright, who decided that there was point of law involved in the case, and that on th question of fact the County Court judge had been satisfied by the evidence that the prepa tion sold was a statutory poison.

In two subsequent cases where the Society p ceeded against unregistered persons for the sale a preparation known as "Powell's balsam aniseed," containing respectively four-tenths one-tenth of a grain of morphine, judgment given for the Society. The case relating to th weaker preparation was appealed against, and th Divisional Court upheld the decision of the learn County Court judge.

Shortly after the decision in the Piper case, i was found that attempts were being made to bring certain preparations containing scheduled poisons within the exemption of the sixteenth section of the Pharmacy Act by securing a grant of Letters Patent in respect of such preparations. An action was brought in October before Mr. Justice Chitty in the Court of Chancery for the revocation of the patent granted to a chemist for a cough mixture containing morphine. The revocation was ordered with costs. A similar judgment was subsequently given by Mr. Justice Stirling in the case of a patented preparation containing laudanum.

Acting on the decision given in the case of this Society *v.* Wheeldon, the Council has proceeded against several unregistered assistants in the open shops of medical practitioners in Scotland for selling poisons. Most of the defendants pleaded guilty and convictions were obtained. In one case, the defendant appealed against the decision of the sheriff, on the ground that the business of a medical practitioner is exempt from the provisions contained in the first fifteen sections of the Pharmacy Act, 1868. The point of law has been fully argued before the High Court of Justiciary in Edinburgh, and the decision of the judges in reference thereto reserved.

The course of proceedings in these cases has been from time to time fully reported in the Journal.

The Local Government Board having forwarded to the Council a copy of a question asked in the House of Commons respecting the unrestricted sale of carbolic acid, together with a copy of the reply given by the parliamentary secretary to the Board, the Council resolved, at its meeting in December last, that carbolic acid ought to be deemed a poison within the meaning of the Pharmacy Act, and ought to be placed in part 2 of schedule A to that Act. A copy of this resolution has been forwarded to the Privy Council for approval, but up to the present time no reply has been received from the department.

With a view to effecting the consolidation of the Society and admitting to a share in its management all registered persons who desire to become associated with the Society, a Pharmacy Acts Amendment Bill has been drafted, and will be proceeded with as soon as a favourable opportunity presents itself. Under the Bill, which is permissive, powers are sought to effect the necessary alterations in the constitution of the Society for the admission, as members, of all those who have passed, or who may pass, the qualifying examination.

The Benevolent Fund account for the year is not encouraging. Whilst the income for 1893 has increased by £74, the increased number of appeals to the Council for assistance has necessitated the expenditure of nearly £600 more than the amount spent in the previous year. It had been hoped that the evidence which has continually been given of the good work done by the Fund in alleviating distress would have elicited a greater amount of sympathy and support from the trade generally. This hope has not been realised, and the Council frequently finds its power to relieve deserving applicants limited in a way that is very disheartening, seeing that the 15,000 persons on the register for whose exclusive benefit the Fund exists are able to make it adequate for all calls upon it.

The Orphan Fund has received during the year subscriptions and donations amounting to £22. The Council was able by its means to secure the admission into the London Orphan Asylum of the orphan of an associate and subscriber to the Benevolent Fund. The maintenance of the orphan at Watford will require an expenditure which practically absorbs the interest on capital, and leaves very little for other deserving cases that may be brought to the notice of the Council.

The obituary for the year includes the names of the following honorary members of the Society:—Robert Bentley—for thirty-eight years Professor of Botany in the School of the Society; Professor J. M. Maisch, of Philadelphia; and Professor Tyndall.

Among the pharmacists who have died during the year, are Joseph Sidney Lescher, one of the survivors of the original meeting held at the Crown and Anchor in 1841, when the Pharmaceutical Society had its inception; Robert H. Davies, a member of the Board of Examiners for England and Wales; Harry Dixon Fuge, Scholar of Trinity College, Cambridge, Bell Scholar (1888), Pereira Medallist (1889), and formerly Demonstrator in the Society's Laboratories, whose early decease is widely regretted; George Pedler (Founder), G. Baggett Francis, who bequeathed £100 to the Benevolent Fund; H. Ayscough Thompson (a former Auditor); William Luff (Oxford), John Carteighe, and the following local and divisional secretaries:—C. Elsey (Maldon); J. P. Provost (Huntingdon); W. J. Bowles (South Kensington); J. Tully (East Grinstead); Cornelius Williams (Pembroke Dock); and C. Batchelor (Fareham).

### PROPOSED INCREASED DUTY ON SPIRIT.

In the House of Commons, on Thursday, Mr. Radcliffe Cooke asked the Chancellor of the Exchequer whether he was aware that the additional duty of 6*d.* per proof gallon on spirit presses very unfairly on chemists and druggists, who cannot recover any part of the additional tax without infringing the Sale of Food and Drugs Act; that it has been estimated that the tax will amount to an equivalent of an extra 2*d.* in the pound on the average chemist and druggist's income; and whether he would consider if means could be devised so that spirit used in medicine could be subject to a special and lower tax than spirit used as a beverage (see page 920).

# The Pharmaceutical Journal.

FIFTY-THIRD YEAR OF PUBLICATION.

◆

*SATURDAY, MAY 5, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

### THE COUNCIL MEETING.

AT the meeting last Wednesday, the additions to the Society comprised fifteen pharmaceutical chemist members, two chemist and druggist members, one hundred associates, and twenty-seven students. On the motion of the PRESIDENT, three honorary members and two corresponding members were elected (see page 922).

The presentation of the report of the Executive of the North British Branch gave opportunity for the PRESIDENT to remark that the work of the Society in Scotland is being carried out in a manner which leaves nothing to be desired.

The report of the Finance Committee contained nothing exceptional in regard to general receipts and expenditure. In connection with the Benevolent Fund account it was stated that the receipts were not more than would be needed for meeting current outgoings, but special mention was made of several donations which have been sent from local associations, these contributions having been the result of social meetings.

On the recommendation of the Benevolent Fund Committee one grant of twelve pounds, four grants of ten pounds each, and two grants of five pounds each were ordered to be paid. Mr. ATKINS drew attention to the circumstance he had noticed on the previous day, that only one of the applicants had ever contributed to the Benevolent Fund, and he mentioned that his object in referring to this fact was to show the propriety of enlarged support to the Fund. Mr. HILLS thought there was some ground for satisfaction that those who contributed to the Fund were not often compelled to seek assistance from it.

Besides the usual routine business referred to in the report of the Library, etc., Committee, it was stated that the draft annual report of the Council had been remitted to the PRESIDENT for final revision. This report, which will be found at page 913, contains a *résumé* of the work of the past year, including several matters of special interest.

In pursuance of notice given by Mr. Hampson, he moved that an alteration should be made in the mode of electing annuitants on the Benevolent Fund. He proposed that the issue of voting papers should be discontinued, and that the Benevolent Fund Committee should select from among the candidates the persons to be elected, for final approval by the Council. His idea is that in this way many of the difficulties which candidates have to contend with in obtaining votes would be done away with, and that the result of the altered system would be to ensure greater fairness in the elections and a more considerate regard for the claims of the candidates. Mr. Rymer Young, in seconding the motion, referred to the fact that only a small number of subscribers to the Fund ever filled up their voting papers, as showing that many do not subscribe for the mere purpose of getting votes, and that considerable difficulty is experienced in discriminating between the claims of candidates. The general tendency of his remarks was in favour of some system by which the fact of having been a subscriber to the Fund might be taken cognisance of in deciding the election of annuitants. This subject gave rise to a long discussion, the report of which cannot fail to be of interest to all members of the trade. Though very general sympathy was felt with the sentiment underlying Mr. Hampson's proposal, the sense of the Council was unfavourable to the alteration suggested, as being of too impracticable a nature, and the motion was negatived.

The resolution passed by the Western Chemists' Association in reference to the Pharmacy Act Amendment Bill was brought under consideration, and was referred to the Law and Parliamentary Committee. The idea that every person who passes the qualifying examination required by the Pharmacy Act, 1868, should in future stand on an equal footing in regard to eligibility as a member of the Society's Council goes beyond the intention of the Bill that membership of the Society should be open to every registered chemist, and it does not make sufficient allowance for the claims of pharmaceutical chemists to be represented on the executive body.

The first portion of the report of the General Purposes Committee related to the prize examinations, and gave a summary of the Professors' reports thereon, together with the names of the candidates recommended for awards (see page 930).

The legal portion of this report gave a statement of the progress which has been made in the prosecution of offenders under the Pharmacy Act. In several cases the defendants have paid penalties, and other cases are still to be tried. Proceedings were ordered in a number of fresh cases which have been reported to the Committee.

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### MEMBERSHIP OF THE APOTHEKER VEREIN.

The German Apotheker Verein numbers at the present time 3094 ordinary members, 14 honorary members, and 3 corresponding members. The number of new members added during the present year is 205, while the deaths and resignations amount to 142. As compared with the same period of the previous year the increase in the number of members amounts to 279.

### ELECTION TO THE WELSH GIRLS' SCHOOL

It will be noticed in the report of the Cou proceedings on page 924 of the present issue th the Vice-President made an appeal on behalf Mary M. Lewis (the orphan of a former mem of the Society), who is a candidate for election the Welsh Girls' School at Ashford, in June ne We are requested to call the attention of We chemists, and especially of local secretaries Welsh districts, to this case, and solicit their towards securing the election of the child. doubt many of those to whom the appeal addressed may not be subscribers to the Loy Society of Antient Britons, but it is very possi that they may have it in their power to influen subscribers to that Society in favour of Mi Lewis.

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### SILESIAN BOTANICAL EXCHANGE CLUB.

The Société des Exchanges Botaniques Silésienne has just issued its twenty-sixth annual list of specimens for exchange. The Director of this Society is S. Mayer, an apotheker of Mainburg, Lower Bavaria. The catalogue itself occupies fourteen foolscap pages, closely printed, and comprises plants from different parts of the world. These are classed alphabetically under Phanerogamæ, Acotyledoneæ vasculares, Musci frondosi, Hepaticæ, Characeæ, Algæ, Lichenes, and Fungi. The rules of the Society are given in both the French and German languages. There is no annual payment demanded, and no admission by vote to the Society, but to cover the cost of printing a deduction of specimens is made. Thus, those who send 100 plants will have twenty deducted towards the cost of publication, etc. This number is reduced to fifteen in the case of those who do not reside in Germany or Austria. As there are apparently 1500 associates, that being the number of lists printed, the work entailed on the Director must necessarily be very considerable. Nevertheless, he evidently finds that there are procrastinators even among botanists, since he complains that the lists and specimens that should be sent in during July are often as late as the end of November. In case of non-compliance with the rules laid down, the Director has the power to exclude an associate from the Society, the main objects of which are to enable working botanists to complete the series of any group they may be working at, and to enable critical botanists to obtain local species or forms for comparison. The list is a very long and valuable one, and includes a large number of forms and varieties. Those who are interested in the Continental flora would do well to obtain further particulars and a list from the Director.

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### EXTRA DUTY ON SPIRIT.

Replying to Mr. Radcliffe Cooke (see p. 919), in the House of Commons on Thursday, the Chancellor of the Exchequer said that it was not practicable to make any distinction in favour of chemists and druggists with regard to the proposed increased duty on spirit, the reasons stated by Mr. Goschen on May 19, 1890, being still applicable in the matter.

# Transactions of the Pharmaceutical Society of Great Britain.

## MEETING OF THE COUNCIL.

*Wednesday, May* 2, 1894.

Present—

IR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Greenish, Grose, lampson, Harrison, Hills, Martin, Martindale, Schacht, outhall, and Young.

The minutes of the last meeting were read and conrmed.

### DIPLOMAS.

The undermentioned, being duly registered as Pharmaceutical Chemists, were respectively granted a iploma stamped with the seal of the Society:—

Bowker, John Taylor.
Casewell, Richard Hazledine.
Donington, Robert Spencer.
Fox, Matthew Henry.
Grindley, Thomas Foulkes.
Guyer, Richard Glode.
Hare, James Archer.
Horner, Robert.
James, George Christopher.
Jones, John Monk.
Kellett, William Herbert.
Lewis, David.
Lewis, Samuel Judd.
Richardson, William.
Robinson, James Frederick.
Smith, Edward Charles Henson.
Smith, Ernest Alfred Austin.
Watkins, Henry Baskerville.

### ELECTION OF MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Akam, Arthur | Bedford. |
| Bowker, John Taylor | Farnworth. |
| Casewell, Richd. Hazledine | Newport, Salop. |
| Donington, Robert Spencer | London. |
| Fox, Matthew Henry | Manchester. |
| Grindley, Thomas Foulkes | Brighton. |
| Guyer, Richard Glode | London. |
| Horner, Robert | Budleigh Salterton. |
| James, George Christopher | Yardley. |
| Jones, John Monk | Wigan. |
| Lewis, David | London. |
| Lewis, Samuel Judd | London. |
| Smith, Edwd. Chas. Henson | Hull. |
| Smith, Ernest Alfred Austin | Bristol. |
| Watkins, Henry Baskerville | Darlington. |

*Chemists and Druggists.*

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Eastman, Jabez Ebenezer | Stratford, E. |
| Lord, James | Nottingham. |

### ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

*Minor.*

| | |
|---|---|
| Ayris, Harry Charles | Birmingham. |
| Bean, Percy | Blackburn. |
| Birkett, Charles William | Bowness. |
| Blanchford, Reginald Arthur | Richmond. |
| Blewett, Edward | London. |
| Boardman, Frederick James | Leigh. |
| Broomfield, Walker Henwood | Lyndhurst. |
| Burgess, Arthur Leland | Guernsey. |
| Clark, William Alfred | Southampton. |
| Evans, Daniel Ashton | London. |
| Graham, Charles Heskey | Manchester. |
| Griffin, James Frederick | Birmingham. |
| Hadfield, James Havelock | Manchester. |
| Hewitt, Joseph Frederick | Burslem. |
| Hislop, Isaac | Glasgow. |
| Johnson, Thomas | Birmingham |
| Jones, Thomas | Swansea. |
| Ker, William Law | Dunfermline. |
| Llewellyn, George Parry | St. Clears. |
| Loxley, Charles Herbert | London. |
| McCurrie, John | Kinross. |
| Mallinson, Fred | Heckmondwike. |
| Mansbridge, Matthew Charles | Cheltenham. |
| Maudson, Charles Frederick | Leeds. |
| Peters, George Henry | London. |
| Phillips, Albert William | London. |
| Rednall, William R. | Wokingham. |
| Robertson, Alexander | Elgin. |
| Robinson, Charles Montague | Attleborough. |
| Slinn, Harry Edwin | Gloucester. |
| Stroud, Louis Lecomte | Tewkesbury. |
| Taylor, Joe Harry | St. Annes-on-the-Sea. |
| Wallace, Mungo | Glasgow. |
| Walton, Frederick Miles | Horley. |
| Wilkinson, Thomas | Crook. |

*Modified.*

| | |
|---|---|
| Bond, John | Minehead. |
| Nix, John Beard | Billericay. |

### ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Amies, Samuel Myddleton | Ludlow. |
| Andrews, Dormer Frederick | Chatham. |
| Angel, Lorenzo Valencia | Birmingham. |
| Anthony, Everard Percival | Bedford. |
| Archer, George Banks W. | Portobello. |
| Ashby, Charles Edmund | Weston-super-Mare. |
| Beales, Walter William | Eye. |
| Beattie, Peter Rattray | Newport, Fife. |
| Beckwith, Christopher | Brighton. |
| Blyth, Wm. John Bucktrout | Sunderland. |
| Brackenbury, Walter R. | Bardney. |
| Bristow, Ralph Pratt | High Wycombe. |
| Butler, Ernest Charles | Stamford Hill. |
| Calvert, William D. | Barnsley. |
| Carter, John Howell | Porthleven. |
| Clear, Henry William | Potton. |
| Cranch, Wm. John Beck | Barnstaple. |
| Dalton, Thomas Duncan | Newcastle-on-Tyne. |
| Daniels, Frederic William | Leicester. |
| Davis, Theophilus Morgan | London. |
| Duckworth, William | Bradford. |
| Edwards, John Griffith | Barmouth. |
| Ellis, John Alfred | Wisbech. |
| Fernie, James | Dundee. |
| Floyd, Harry Victor | Soham. |
| Flood, Frank | Woburn. |
| Forby, Archibald | Downham Market. |
| Freeman, Thomas | Beverley. |
| Gili, Gerardo | London. |
| Gunstone, Herbert Challiner | Oxford. |
| Henry, Thomas Anderson | Barrow-in-Furness. |
| Hill, Aubrey Thomas | Boston. |
| Hora, Tudor Travers | London. |
| Horner, Thomas William | Leeds. |
| Hughes, David | Bath. |
| Jessup, Robert Markham | Manchester. |

| | |
|---|---|
| King, Charles Edward | Berkhamsted. |
| Lander, Arthur | St. Keyne. |
| Llewellyn, James | Pembroke Dock. |
| Malins, Templar Edward | Newport, Mon. |
| Mannox, Gertrude Annie | Sutton Coldfield. |
| Menhinick, John | St. Mabyn. |
| Mundy, John Frederick | London. |
| Pack, Frederick James | Brighton. |
| Pennington, John Richard | Worksop. |
| Pilsbury, William | Eccleshall. |
| Rees, William Edward | Llanidloes. |
| Roadknight, Chas. H. Watson | Atherstone. |
| Skinner, Herbert | Nottingham. |
| Smith, Maurice | Kidderminster. |
| St. Cyr, Etienne, Laurent Nelvil | London. |
| Thompson, John Cooke | Tunstall. |
| Thorp, Ernest | Southport. |
| Tree, John | St. Leonards. |
| Tweedy, John Henry | Northwich. |
| Waddell, John | Glasgow. |
| Walker, Alfred Ernest | Coventry. |
| Whittle, Hugh | Manchester. |
| Williams, George | Redruth. |
| Williams, Gregory Thomas | Cardiff. |
| Wilson, Archibald Ralph | Bishop Stortford. |
| Wilson, Henry Augustus | Kenilworth. |
| Woodward, Robert | Old Newton. |

### ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Allen, Charles Trounson | Kilburn. |
| Coward, Miles | Keswick. |
| Garbett, Charles | Halifax. |
| Garnham, Albert Edward | Southwark. |
| Glasscock, Frank George | Norwich. |
| Gray, Percy Bunting | Northampton. |
| Hill, Edmund Percy | Northampton. |
| Hinchliffe, Frederic | Lower Weston. |
| Howden, Joseph Thomas | York. |
| Jones, Robert Coetmor | Bethesda. |
| Langham, Ebenezer | Salisbury. |
| Last, Ernest Charles | Ipswich. |
| Leslie, Bertie Samuel | Penge. |
| Metcalfe, John Thomas | St. John's Wood. |
| Middleton, John George | South Norwood. |
| Pilkington, John, junior | Buxton. |
| Pratt, William | Shipston-on-Stour. |
| Read, Harold McLean | Alnwick. |
| Rees, Wm. Ernest Jenkins | Pontypridd. |
| Room, Frederick Rupert | Kington. |
| Sangster, James | Old Deer. |
| Shand, Alexander | Old Meldrum. |
| Sharman, Harry Richard | Chipping Norton. |
| Senter, George | Mossat. |
| Smedley, Walter Graham | Northampton. |
| Swaffin, John Phillips | Dartmouth. |
| Tew, Arthur Wilson | Warwick. |

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Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

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### HONORARY MEMBERS.

The PRESIDENT moved that the following gentlemen, whose names had been placed in the Library during the past month, be elected Honorary Members of the Society:—

Sir Frederick Abel, Bart., F.R.S.
Professor Sidney Ringer, M.D., F.R.S.
Professor J. P. Remington, Philadelphia.

It was not necessary to refer to the distinguished position these three gentlemen occupied in their respective scientific callings, but it was, perhaps, right to say with regard to Sir F. Abel, that while he had been of great service to the Society in educational matters for many years, as well as a distinguished man of science, his name had not been selected for consideration as an honorary member, because the number being limited, it was imperative to choose those men whose work was more closely connected with pharmacy than his had been up to recent years. But seeing that he was now at the head of a great establishment where technical work would be in future required, and that he was in the position of receiving from time to time drugs from various parts of the world, some of which might be submitted to the Society for examination, it was only right now to elect him, as being practically eligible on the technical side. Professor Ringer was a distinguished physician and therapeutist, and Professor Remington was the President of the American Pharmaceutical Association and of the International Pharmaceutical Congress last year, and was the successor in the chair at Philadelphia of many distinguished pharmacists. He was sure they would all feel a pleasure in being able to add an American pharmacist to the roll in place of the late Professor Maisch.

The VICE-PRESIDENT seconded the motion, which was carried unanimously.

### CORRESPONDING MEMBERS.

The PRESIDENT moved the election of the following gentlemen as corresponding members:—

Dr. George Watt, C.M., C.I.E., Calcutta.
Professor H. H. Rusby, M.D., New York.

These gentlemen were distinguished both in botany and materia medica, and Dr. Watt had already sent many specimens of Indian drugs, and as corresponding members both gentlemen would no doubt assist in the work of the Society.

The resolution was carried unanimously.

### REPORT OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

*Annual Report of the Executive of the North British Branch.*

"The Executive of the North British Branch has now to submit the following report on the work of the year, March, 1893, to March, 1894.

"At a meeting of Executive held on April 20, 1893, it was arranged that the annual election should take place on Thursday, June 1, 1893, and the present Executive was accordingly elected at a meeting of members and associates in business of the Society residing in Scotland held on the above date.

"The Executive has held three meetings during the year. At the first meeting, on June 8, 1893, Mr. James Laidlaw Ewing, Edinburgh, was elected Chairman, and Mr. Charles Kerr, Dundee, Vice-Chairman, and the resident members were appointed a General Purposes Committee to attend to business arising between meetings of Executive.

"The General Purposes Committee has met three times, and has had charge of the operations in connection with the new buildings, and of the arrangements for Evening Meetings of the Society in Edinburgh. The Committee has also had charge of the scheme for the appointment of additional local secretaries in Scotland, and the Executive observes with satisfaction that the Council has been able to appoint officers in each of the new centres recommended.

"At a meeting of Executive on November [illegible] 1893, the following were nominated for election by the Council as the Board of Examiners for Scotland for the year 1894:—Peter Boa, Edinburgh; David Brown Dott, Edinburgh; Jonathan Innes Fraser, Edinburgh; Adam Gibson, Edinburgh; James Jack, Arbroath; Thomas Maben, Hawick; John Nesbit, Portobello; and John William Sutherland, Dumfries.

"The financial statement for the year up to [illegible] December, 1893, showing an expenditure of

£1093 10s. 11d., as compared with £977 1s. 2d. for the previous year, has already been forwarded to the Council.

"The following particulars indicate that the departments connected with the Branch continue in a satisfactory state:—

"*The Examinations.*—The Board of Examiners is still conducting these examinations in the old premises. Every effort has been made to have the arrangements as convenient as possible for both candidates and examiners, but the need of better accommodation continues to be urgently felt. The plans for a new hall and laboratories approved of by the Council in August last and remitted to the Executive are now in process of being carried out, and the work is advancing towards completion in a satisfactory manner. Tenders for buildings amounting to £1605 have been accepted, and the work in all departments is well advanced; the mason work being practically complete, and the roof almost finished. Further tenders for internal fittings and plumber work in the laboratories amounting to £370 have also been accepted, and the material is being got ready with all possible speed. It is expected that the hall and laboratories will be ready for occupation by the month of October.

"There has been a decrease in the number of Major candidates (13 as compared with 15 last year) and a further decrease in the percentage of passes (30·77 per cent. as compared with 60 per cent).

"The number of Minor candidates continues large, and indicates an increase (395 as compared with 326). Here also there has been a further falling off in the percentage of passes (40·25 per cent. as compared with 51·5 per cent.)

"*Evening Meetings.*—The evening scientific meetings have been continued during the past session, and have been attended with very gratifying success. Five such meetings have been held. The Executive desires to record its thanks to Professor J. Theodore Cash, M.D., of the University of Aberdeen, who gave the opening address, and also to the other gentlemen who contributed papers during the session. It is expected that the new hall will be available for these meetings next session, and that they will thus be conducted with greater convenience and comfort to all parties.

"*Library.*—The Library has again been enriched by the addition of a considerable number of new and valuable books and standard works of reference, partly by donation, but chiefly by purchase. The donations include an important and comprehensive "Dictionary of the Economic Products of India," by Watt, received from Her Majesty's Secretary of State for India.

"A new edition of the catalogue of the Library has been prepared during the year, and published along with the new edition of the London Library catalogue.

"The Library continues to be largely taken advantage of, as will be seen from the following statement:

*Circulation of Books.*

| | |
|---|---|
| April, 1893, to March, 1894 | 1223 |
| " 1892, to " 1893 | 1664 |
| Decrease..... | 441 |

"This shows a decrease as compared with last year, but there is no special remark to make thereanent.

"The Library continues to be largely used for purposes of reference, and its value in this respect has been much enhanced by the standard works purchased by the Council during recent years. The space for books in the present room is almost completely filled, but, as stated in last year's report, it is expected that larger and better accommodation will be provided when the present extension of premises is completed.

"The circulation of books to provincial readers also shows a slight decrease. During the twelve months (1892–1893) 143 volumes were circulated to readers outside Edinburgh and Leith. During the twelve months (1893–1894) 114 volumes were so circulated. The Executive would again point out that, by this arrangement for circulation of books, provincial chemists may avail themselves of the Library in a very convenient way, and at a trifling expense.

"*Museum.*—The Executive has again to thank donors of specimens received during the year, and several duplicate specimens have also been received from Bloomsbury Square. The students' specimens have just been renewed, and are now in good order. It is proposed also to extend the accommodation for the Museum when the Library has been shifted under the readjustment contemplated after the completion of the new premises. This will allow of a better arrangement of the specimens, many of which are not at present exhibited for want of proper space.

"The attendances at the Society's Library and Museum are indicated by the following table:—

| | |
|---|---|
| April, 1893, to March, 1894 | 3146 |
| " 1892, to " 1893 | 2655 |
| Increase...... | 491 |

"This indicates an increase as compared with last year, but as pointed out in last report, these figures are only a rough approximation to the actual number of visitors, as many neglect to sign the book.

"*House.*—The whole property and furnishings of the Society in Edinburgh are now in good order. In view of the contemplated changes in the internal arrangements, no extra expense has been incurred during the year for painting or repairs.

"James L. Ewing, Chairman.

"36, York Place, Edinburgh, April 19, 1894."

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The President, in moving that the report be received and entered on the minutes, said it was a carefully compiled record of the work of the Executive, much of which had already been learned from the reports of their proceedings. The result was that the working of the Society in Scotland was being conducted in a manner which left nothing to be desired. That the Council fully believed this was evidenced by the fact that it had cordially responded to the suggestion for increasing the premises, and he was glad to hear that the new examination buildings were progressing very satisfactorily. The Council was much indebted to Mr. Ewing for his unwearied devotion to the interests of the Society in the North, and also to their excellent officer, Mr. Rutherford Hill.

Mr. Greenish asked if there were a reading-room at the library.

The President said there was, and it was very well attended.

The resolution was unanimously agreed to.

### Report of the Finance Committee.

The report of this Committee was of the usual character, and recommended sundry accounts for payment, also the transfer of £2000 to deposit account.

The President (as Chairman of the Committee), in moving the adoption of the report and recommendations, said the bulk of the receipts during the month had consisted of subscriptions, with a few examination fees. There was nothing special in the payments, except a sum of thirty guineas which it was proposed to pay to the widow of Professor Bentley for certain books and specimens which it was thought desirable to acquire. With regard to the Benevolent Fund, subscriptions had been received to the amount of £769 and a small sum of dividends, and after the payments had been made there was £815 left in hand, which was by no means more than required to meet current outgoings. On the donation account, Mr. Hulme, of Bury, had given a donation of five guineas, and on the Orphan Fund account ten guineas had been received from Mr. George Cooper, of Branscombe. Since the last meeting £500 Consols had been purchased on account of the Benevolent Fund, leaving £31 odd on the donation account, to be increased, he hoped in due course, to such an amount as would warrant a further investment. On the Orphan Fund account £100 had been invested, leaving £38 18*s.* 9*d.* still in hand. He should mention, which he did with great satisfaction, that amongst the donations to the Benevolent Fund were several sent by the local associations at Brighton, Edinburgh, Liverpool, and Plymouth, representing the amounts collected at or realised by smoking concerts and similar gatherings.

The motion was unanimously agreed to.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£5 to the widow (aged 50) of a registered chemist and druggist, who has had four previous grants, amounting to £30. (Redhill).

£10 to a former associate (aged 76), who has had two previous grants of like amount. (Croydon).

£12 to the widow (aged 58) of a registered chemist and druggist, who had a like grant in December, 1892. (Ashwell).

£5 to a registered chemist and druggist (aged 63), who has had to give up business on account of ill-health. (Totnes).

£10 to the widow (aged 70) of a registered chemist and druggist. She has had seven previous grants of a similar amount. (Birmingham).

£10 to the widow (aged 63) of a registered chemist and druggist, who has had three previous grants. Two daughters are out of employment, and another is a hopeless invalid. (St. Leonards).

£10 to a registered chemist and druggist (aged 53), who is a cripple, and has had to give up business. He has no means. This case had been deferred for further inquiries. (Luton).

One other application was deferred, and two were not entertained.

The VICE-PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. He pointed out that a considerable sum had been voted in casual grants, and that the Committee had to rely on the subscriptions received to carry on this important part of its work. He hoped, therefore, that those who had not yet subscribed would hesitate no longer, and would not only subscribe themselves, but endeavour to obtain new subscribers. It was very gratifying to hear that several societies of young men in their hours of amusement had remembered the claims of the fund, and if chemists throughout the country would show their active sympathy in the same proportion there would be a very different result at the end of the year. Of course, he knew there were many other claims on local chemists, but still a number of small subscriptions would make a great difference in the total. There was one case which he had heard of that morning which he wished to bring especially before the notice of the Council and the chemists and local secretaries throughout the country. It referred more directly to Wales, and he would ask his Welsh colleagues to do all they could in the matter. It had reference to an election to the girls' school at Ashford next June, and votes were requested on behalf of Mary Margaret Lewis as a paid scholar. She was the daughter of the late Richard Lewis, a chemist, of Dolgelly, who was for many years a member of the Society. The widow had never made any claim on the Fund, but had supported herself, and, although she was only earning about £25 a year in service, she would have to pay out of that £16 a year towards the maintenance of this girl if she was successful in being elected. He therefore appealed to all Welsh local secretaries to do what they could to obtain votes, and he would be glad to do what he could personally.

The resolution was carried unanimously.

Mr. ATKINS said he hoped the facts which came before the Committee on the previous day might be regarded as unique, but he noticed that only one of the applicants had ever contributed one penny towards the Society or the Benevolent Fund, and that one was simply an associate from 1842 to 1846. The various applicants had already received £182 from the Society, and the grants made now amounted to £62, with a possible further increase of £20 in certain events, so that at any rate £244 had been received by these persons, the only contributions to the Society having been an associate's subscription for five years. He had always argued in favour of the broadest catholicity in the administration of the fund, but looking at these facts he confessed they somewhat staggered him. He feared that if such facts became widely known, that some would hesitate to continue to subscribe, but he hoped that would not be the case. He knew the President's view always had been that this was not in any way an insurance fund, and of course that was correct, and it was improbable such a case as the present would occur again, and he only mentioned it as a further ground for enlarged support to the fund.

Mr. HILLS said he was rather sorry that Mr. Atkins had made the remarks he had, but from another point of view he hoped the same state of things might occur again, because the inference seemed to be that those who gave to this catholic fund were not often compelled to seek assistance from it, and they might all rejoice that such was the case.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| March . . . | Morning | 486 | 34 | 6 | 21 |
| | Evening | 68 | 10 | 1 | 3 |

Donations to the Museum had been announced (*Pharm. Journ.*, April 14, p. 861), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

A letter of thanks had been received from the Aberdeen and North of Scotland Chemists' and Druggists' Association for a collection of duplicate specimens of dried medicinal plants and drugs.

#### *Library.*

The report of the Librarian had been received, including the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| March . . . | Day . . | 479 | 29 | 10 | 19 |
| | Evening . | 198 | 20 | 3 | 10 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| March . . . . | 248 | 132 | 116 | £1 7*s.* 0*d.* |

Donations to the Library had been announced (*Pharm. Journ.*, April 14, p. 861), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

*For the Library in London*—

Squire, Companion to the British Pharmacop
16th ed.
Sawer, Odorographia, 2nd series.
Behrens, Microchemical Analysis.
Oliver, Systematic Botany.

*For the Library in Edinburgh—*
White, The Microscope and How to Use it.
Ostwald, Chemistry.

The staff of the Society's School had attended and eported on their respective classes.

*Professor Bentley's Specimens.*

Professor GREENISH and the Curator had reported hat they had selected a number of specimens, books, liagrams, plates, etc., from the collection of the late 'rofessor Bentley, which they suggested would be iseful to the Society, and it was recommended that he sum of thirty guineas be paid for them.

The draft annual report was submitted, amended, ınd remitted to the President for final revision.

An application from Mr. T. K. Gajjar, M.A., B.Sc., f Baroda, for copies of the *Pharmaceutical Journal* .s published, was recommended to be granted.

At an adjourned meeting of the Committee the ınnual report, as revised, was adopted.

The PRESIDENT, in moving the adoption of the eport, said there was nothing special to refer to, the nain business having been the preparation of the ınnual report, which would come on for consideration ater.

The resolution was unanimously agreed to.

'HE ADMINISTRATION OF THE BENEVOLENT FUND.

Mr. HAMPSON then moved the following resolution, f which he had given notice :—

> "That after the year 1895, the present method of election of Annuitants on the Benevolent Fund by Voting Papers be discontinued, and in lieu thereof the Benevolent Fund Committee be authorised, at its December meeting, to select from the list of Candidates approved by the Council in the previous October, a number of persons corresponding with the number of Annuitants which the Council has decided are to be elected. The list of such persons shall be submitted to the Council at its December meeting, and, if approved, the Council shall be authorised to elect the persons named in that list Annuitants on the Benevolent Fund."

Ie said he had so frequently referred to this subject hat he thought it was about time that he put the natter in a concrete form, and asked the Council to ıccept the principle embodied in the motion. The reasons which weighed with him for several years he had frequently referred to, but he would briefly recapitulate he evils of the present system. In doing so, he would ndeavour to place himself in the position of a candilate for election. Having failed to secure a sufficient um of money for his sustenance in old age, he found iimself unhappily obliged to seek aid from the fund. Ie might find himself in bed—ill, paralysed, and incapable—and the conditions were such that if he vere to have any chance of becoming elected he must, f unable to move himself, call to his aid any friend or riends he might have. Of course, if he had friends—nfluential friends—he had a good chance of success; ut otherwise he had a very poor chance and, at any rate, would have to wait a very long time. That was one of the features of inequality in the matter. It was quite clear that the candidates seeking election lid not occupy the same positions, but very lissimilar positions. He might illustrate this by referring to the last election, which was a typical one in this respect. There was then one candidate, a very worthy man, who had the important support of a gentleman well known to them all, well known in the scientific world, and mainly through his influence his election was perfectly secure. But unfortunately through that influence the fairness, if there were any fairness at all in the method of election, was actually disturbed, because that gentleman's influence naturally robbed, he might say, the other candidates of a very considerable number of votes. Not only had this particular candidate the help he had just referred to, but also the aid of two wholesale houses, and, he might assume, the help of the travellers representing those houses. Now he had a great respect for the drug travellers, a very influential and useful body of men, and must not be supposed to cast any animadversion upon them in any sense; they only took a part in the evil system which prevailed. Another successful candidate had the names of six wholesale houses attached to his card, and also that of one member of the Council. Another case was supported by an important association in a large town, and by another member of Council. That was a fair sample of what took place. If the competition was fair and equal, there might be something to be said on its behalf, but it was impossible to make it fair, and apart from that there was all the anxiety of the candidates, and the necessity of spending money to endeavour to obtain the coveted position. It had been ascertained that in the charities of London alone there were 9000 unsuccessful candidates, and that they spent a sum of nearly £45,000 in endeavouring to secure a position at the poll. Of course, that expenditure went principally in cards, postage, and printing. One important fact of the last election was this, one individual was aged 85, and no doubt any casual observer who was asked who was the most likely candidate to succeed, having read the names and circumstances narrated, would have said undoubtedly that that man of 85 would be at the top of the poll, but unhappily he failed altogether, although he had been a subscriber to the Fund. He must admit that he had received some help, some inadequate help from the fund since as a sort of placebo, but he might not live to reap the full benefit of the fund, and if anything should occur to him before another election he should exceedingly regret it. The question was, was it necessary to continue the present method of election? and he wanted to hear what was to be said on the other side. His opinion was that it was not necessary. This evil had grown throughout the country for many years, and it might be difficult to revert to a better plan, but it would be very gratifying to him, as a chemist, to find that Society step out of the beaten track and establish a more humane system. It would be so much to the credit of the Society and of humanity. He was prepared to hear it stated that the Fund might sustain some damage if the plan were altered. It might possibly to some extent, but he had a perfect belief in the benevolence of those who contributed to it. A certain number, perhaps, would say, "No, you have deprived us of the privilege, of patronage and the power," but he thought they would be few. Personally he would double his subscription if the plan were altered, and he thought many others would do the same. He had confidence in the real benevolence of the supporters of the Fund. Then came the question, how could the new method be carried out? He proposed that the Committee should undertake the selection alone, or with the assistance of some members of the Society nominated at a proper time to serve with them. The Committee already made a selection of cases; it was in possession of all the facts; most of the cases had come up time after time for help before they reached the position of candidature, so that the Committee were thoroughly well posted in all the details. They were not simply furnished with the meagre statements which appeared just before the election, but they knew all the circumstances of each case. He was very glad to be able to refer to the fact that in establishing the Orphan Fund it was thought unwise to follow this system of election, but the Committee virtually selected the recipients, and he felt persuaded that that Fund would not in any way suffer thereby. He simply wished to carry out the same principle in the Benevolent Fund. In carrying out an important function of this kind the Society should take a high ethical position. Charity should be perfectly free as far as possible from any counterbalancing evil, and he might refer to the lines of Wordsworth :—

> "The primal duties shine aloft like stars,
> The means that soothe, and live and bless,
> Lie scattered at the feet of men like flowers."

But in this case they did not lie scattered at the feet of men like flowers, it was something thrown to them to fight for, and with all deference to those who differed from him, he must say this fight was unnecessary, cruel, and humiliating.

Mr. YOUNG said he anticipated some little difficulty with reference to this motion; at the same time it had his sympathy, and he would second it. Mr. Hampson had drawn attention to what were the clear evils of the present system, and it was distressing beyond measure to find, time after time, that someone who had been a subscriber for fifteen or twenty years was at the bottom of the poll, whilst someone who had never contributed a farthing might be at the head, owing to some special pleading or special canvassing. Although it might be urged that the Committee having selected what they considered eligible candidates, these should all be regarded as equal, there were, after all, degrees of poverty which destroyed this equilibrium. A person might be penniless at sixty, or at eighty, and a person might be penniless having subscribed for years to the Fund, or having never helped anybody in the world. If there were half-a-dozen candidates to select from, and only four vacancies, he should certainly select for the first place the one, whoever he might be, who had contributed to the Society, and if there were any vacancies left, and no subscribers, he should then take them by age. That might be a rough and crude idea; but still there was a growing feeling that it was useless even to subscribe to a benevolent fund, as the same benefit might be obtained without it. He did not believe that any large number of persons subscribed for the mere purpose of getting votes, and was rather inclined to think that the fact that not half of them ever filled up their voting papers was due not so much to indifference as to inability to discriminate. If it were difficult for the Committee to make the best selection, with all its machinery for investigation, backed up by the Secretary, who worked at it as a labour of love as well as a duty, it must be practically impossible for any outsider, who simply got a voting paper once a year, with a list of names he had never heard of. As a member of the Committee he had felt it very strongly, month after month, that they should be voting away money to people who had never helped them in the slightest degree, and that something should be done to secure assistance to an old subscriber when he was obliged to come forward. It was, of course, matter for congratulation that very seldom indeed subscribers did fall into poverty; but then such cases did occur, and it was all the more distressing when such a person was found at the bottom of the poll.

Mr. GROSE thought the country subscribers got pretty well posted up as to who they should vote for by the information they obtained from the candidates' friends, whether they were commercial travellers or wholesale houses. He had regretted that there was no distinction made between those who had in former times helped themselves and others, and those who came on the Society simply when they had nowhere else to turn; if that could be altered, it would be a great gain to the Fund. But he was also afraid that to take away the power of voting from subscribers would not be popular. There was a certain amount of satisfaction in being able to fill up a voting paper for a friend, if, unfortunately, that friend were an applicant for an annuity, and he thought the subscribers would feel the deprivation, and that they were losing a privilege they now paid for.

Mr. ATKINS was sorry he could not support this motion. It was needless to add that they were all convinced of the benevolent motives which prompted the mover, but they must view this matter from a practical standpoint as men of the world, taking humanity at its present level, and recognising the motives which prompted men's action. But he feared that on the grounds of expediency it would be bad business. He would not say that men paid so much money to buy so many votes, but there was a feeling that if you subscribed you expected to have a certain amount of patronage, or power, or benefit, to the value of your money. Then there was another point which seemed to be of some importance. It would be a very serious responsibility to throw on the Committee, and if he were one of half a dozen men who had to sit down and decide a question which meant life or death, or the comfort of a man or woman in their closing days, it would entail such an amount of anxiety that he should really *feel obliged* to decline it. At best they could only assess the evidence roughly, and to have this additional weight of responsibility thrust on the Committee would be a very serious matter. The one point, however, which weighed with him most was that he feared the Treasurer would find there would be a much larger falling off in the subscriptions than he anticipated. Mr. Hampson thought the percentage would be small—that others would make up by increased subscriptions for the loss; but he (Mr. Atkins) believed the large majority of charitable institutions would be afraid to enter upon a crusade of this kind. He had asked the secretaries of some institutions in his neighbourhood how far a principle of this kind would be likely to affect the results, and they told him they would hesitate very much to embark on such an experiment, mainly from a financial point of view. For that reason he could not support the motion.

Mr. SOUTHALL said he was glad to be able to support Mr. Hampson. They had just heard that other institutions of a somewhat similar character were afraid to adopt the plan suggested. That was not his experience in Birmingham. There, one of the largest hospitals nine years ago adopted the plan of giving up the subscribers' letters of recommendation, and though at first the subscriptions fell off a little, on the whole they had been kept up. That example had been followed by a great many of the other similar charities of the town, and he believed that the plan was a much better one. They relieved those who wanted relief much better than the subscribers could do it themselves, and the subscribers were very glad not to have the trouble of dispensing their charity—feeling very often they could not do it as well as it could be done by the proper officials. He was surprised to hear Mr. Atkins say he would not like the responsibility of dispensing the charity. He thought a few gentlemen who thoroughly went into the different cases could dispense it far better than a number of individuals scattered all over the country. Something had been said about the wholesale houses, but he did not think it was a privilege they were very anxious about. He thought they would be very glad to subscribe their money, and not to have the trouble of endeavouring to see also that the money was properly spent. It cost a great deal to the Society to send out all these voting papers, but it cost the poor individuals far more. In Birmingham other places had been adopted for getting subscriptions. There was a Saturday afternoon collection for working men, and there was also a Sunday collection, and he believed that the Society could start something a great deal better in the way of advertisement for the Fund than by asking chemists all over the country to vote for the different candidates. Therefore, although they were rather a conservative body, he hoped they might, after a while, at any rate, adopt the plan of not putting the poor people to the trouble and expense of seeking for votes all over the country.

The **Vice-President** said he promised some time ago, when Mr. Hampson brought forward a similar motion, to give it his serious consideration, and he could congratulate him on the speech he had made in introducing the subject, and felt sure that everyone would agree with much that he had said. Notwithstanding that, he remained of the opinion that the present mode of election was preferable to the one suggested, and that on grounds of expediency alone. The Committee only selected the candidates, the subscribers elected them. He could not conceive a more ungracious task than the selection of annuitants by a small committee; however well it might do its work, how was it to convince the people who found the money that it was done fairly? In a small town or a district of a large town, such as was managed by the Charity Organisation Society, where the whole matter was under the eye of the subscribers, it might possibly be admissible, but where you had to deal with the chemists of Great Britain, who lived a long distance from the capital, the conditions were wholly different. Men sent their subscriptions from all parts of the kingdom, and he thought it was a good thing to make them feel once a year that they were doing something personally to make the Fund a success. Very often the country subscribers got hold of a case which they knew was a deserving one, and by their votes were able to testify the sympathy they felt in their unfortunate brother's condition, and by means of correspondence and in other ways gave him their support. It would be impossible, under any conditions, to make an election square altogether with true benevolence; but under the present system he thought there were fewer evils than would arise from adopting the motion. It was not as if the unsuccessful candidates were utterly neglected, and he thought it was quite a misnomer to call the relief given them a placebo, it was a solatium; and even if they had to spend five pounds for printing cards, they received more than enough to cover that, and to give them a substantial sum in addition. He thought the present system was to be preferred, because it opened up wider sympathies and was less open to the charge of unfairness than the one the Treasurer suggested. It was not because he did not sympathise with the hardship on a poor friendless person, or the distress he might undergo when he found he was not elected. In fact, he did not treat the matter at all antagonistically, but had thought it carefully out, and felt bound to oppose the motion.

**Mr. Harrison** said while he supported as strongly as he possibly could the principle brought forward by Mr. Hampson, he should like to suggest an amendment as to the way in which it could be carried out. The case against him had been put fully and fairly, but at the same time he was as convinced now as when Mr. Hampson sat down that the change which he suggested was right and proper. He could not conceive for a moment, having considered this subject for some time, that the subscribers really subscribed for the purpose of exercising patronage, power, or authority. He believed it was entirely on benevolent grounds that men subscribed, and not with any wish, because they subscribed a small sum, to receive a list of a number of persons who might be deserving and ought to receive relief, and be asked to discriminate as to which of those should receive it. If the election were placed in the hands of a strong committee, which had opportunities of obtaining information denied to the original subscribers, if the subscribers had confidence in that committee that it was humane and just, he should be far better satisfied to leave the responsibility with them. He was quite sure the members of the committee would take the responsibility, notwithstanding what had been said, rather than himself give a haphazard vote. It was impossible, with a large list of names before him, to discriminate the proper person to whom help should be given. They had no right to extend sympathy to those who might have the greatest amount of support from outside, but the necessitous condition of the applicant should decide the matter. If an applicant had friends, they might be able to bring an amount of pressure to bear which did something to ensure success, but surely those friends could be appealed to, if the case was very necessitous, to help their friends in a more direct way. What was wanted was not to assist the man who had the greatest number of friends, but him who was most necessitous, even if he had no friends. The one thing which would strengthen the fund more than anything else was that its application should be placed in the hands of those who had the greatest amount of information at their command, and could dispense it to the greatest advantage. Mr. Southall had referred to a specific instance which supported that view, and he could corroborate it. Some years ago the admission to the Infirmary at Sunderland was by ticket, and there was the usual scramble amongst subscribers to obtain them, and at that time the income had never been made to balance the expenditure, but that system was afterwards changed, and the only title to admission was the necessity of the applicant. As long as there was room, and the applicant was necessitous, he was admitted. The Infirmary now managed to pay its way, and did a very much larger amount of work, and of the £10,000 which it cost, three-fifths was subscribed by the working people themselves. That showed that as they learnt that the admission was on sound principles, that it was not a question of patronage or influence, but simply a necessity, they came readily forward and subscribed money week by week, and maintained the institution in a much more healthy condition. He believed the same thing would apply to chemists and druggists. He did not think any considerable number at any rate subscribed from any less motive than that of the highest possible charity, and he desired to see all limitations whatever on the administration of the Fund removed, so that it might be dealt with in the most broadly catholic spirit. Having said this much in favour of the motion, he could not say he approved of the method of carrying out the principle. In the first place the selection appeared to be in the hands of the Council, then it was sent to the Benevolent Fund Committee, which selected the names to be elected, and those were to be approved by the Council. Here he thought Mr. Hampson had just missed the point. He should ask the Committee to prepare the list of applicants whose applications were in strict conformity with the regulations, and submit that to the Council two months before the time for election, and then let the Council openly, in the eyes of their constituents, select those who should be elected. The Committee was a strong, useful, and valuable Committee, at the same time the Council was bigger than the Committee, and stronger. Two heads were better than one, and twenty-one were better than fourteen. Therefore, whilst he wished to take the election out of the hands of the subscribers themselves, he would place it in the hands of the Council, which should act in full sight of the constituents. He would therefore move as an amendment, after the preliminary words—

> "That the Benevolent Fund Committee be requested to formulate a scheme for the consideration of the Council, by which such election shall be in the hands of the Council."

He had not put down the exact method, because he did not wish to commit the Council to it without full consideration. He preferred to send it to the Committee, to which he should be glad to give his views on the matter. He was convinced they were all in perfect accord to administer the funds in the best possible spirit, and it was only after mature and careful consideration—having watched the operation of this fund and similar funds in various parts of the country—that he felt thoroughly convinced that the best method to adopt was to place the administration in the hands of those who had the fullest and most complete information as to the circumstances of those who applied.

The amendment was not seconded.

Mr. **Martindale** said he thought Mr. Hampson's views were probably right in the abstract, but this Benevolent Fund was quite exceptional in character. The elections did not entail anything like the expense on the candidates which many charities did, where it was a question of touting all round the country. Not that he objected to that altogether, and there were many benevolent persons, old ladies, and some men who had retired from business, who devoted their lives almost to this sort of thing, and he should not like to make a sweeping assertion that this was entirely an evil. But in their case the fund was distributed with the least possible cost to the candidate, and with the greatest benefit to him. Mr. Hampson made a great point about the failures, but even those who failed always received some assistance. He thought the voting papers were of use in reminding subscribers of the Fund, and even as an advertisement simply it would be a great pity to do away with them.

Mr. **Schacht** wished to say, as the result of several years' consideration of this matter, that first of all he felt that the first consideration should be the Fund itself; the Fund must be maintained, and the process by which it was maintained and extended—as they all hoped it would be—was an essentially popular one. All members of the craft, even those who could afford no more than 2*s*. 6*d*. a year, were invited to contribute; and however much they might endeavour to persuade themselves that every subscriber was actuated by perfectly pure and disinterested motives, experience taught that men were actuated by various motives, and that a little stimulus to bring the better feelings into action was very desirable. These annual appeals, therefore, were of. great use, in his opinion, in maintaining the Fund. He had had some experience of other institutions maintained by popular contributions, and on many occasions he had put the question directly to their supporters, whether such a change as was now suggested would be beneficial, and he had invariably received the answer—"I should be very sorry to lose my voting power." He could not help thinking that the question must be considered from that point of view. The appeal for the sustentation of the Fund was essentially popular, and the administration should be as nearly popular as it could be made. Of course, it could not be done entirely by the subscribers, but in the first place those best qualified to select made a selection. The Committee, which had been month by month carefully examining every application, finally came to the conclusion that a certain small number were the most eligible applicants, and then an appeal was made to the subscribers at large to vote for them. There could not possibly be any great abuse under this system. It must be a very rare thing for a really deserving case to fail entirely. Occasional mistakes might occur, but they could not be numerous, and the risks which would be run by making any organic change were too great to justify the attempt; especially remembering the reminders they constantly had that the fund was not sufficient for its purpose.

Mr. **Hills** said he had so often expressed sympathy with Mr. Hampson's views that he felt bound to say why he could not support him on this occasion, though it was not necessary to say much after the last speech, which had really put the matter in a nutshell. He agreed with Mr. Hampson in nearly all his statements, but not in his conclusion. No doubt there was a deal of hardship on some of the candidates, and a great deal of money was spent needlessly; but, on the whole, he thought the present system was the best for the Fund itself, and he dared not, as a business man, bearing in mind the mixed motives which actuated mankind, vote for anything which he felt sure would lessen the amount of subscriptions received. He had been interested in the remarks of Mr. Southall and Mr. Harrison as to what was going on in their districts, and was delighted to hear of the success of the new system, but they had not had the particulars of those cases, and at any rate they did not seem to him to be on all fours with the Benevolent Fund. They did not refer to annuities for a definite number of persons who were to benefit by a fund which was not capable of indefinite expansion. He must repeat that in giving a vote, though he might pay some attention to the fact that a man had subscribed previously, the real governing condition should be the necessity of the case, irrespective of what the applicant had done or been able to do in times past for the Benevolent Fund. Mr. Hampson had referred to Wordsworth, and he might refer to a higher authority still, which said that God made his sun to shine on the evil and on the good, and on the just and unjust, alike. That was the true rule in the administration of charity.

Mr. **Allen** said he did not like to vote against Mr. Hampson without giving his reasons, especially as none of the previous speakers had exactly put the matter as it appeared to him. Whilst he agreed with the spirit of Mr. Hampson's proposal, he thought the attempt to carry out such an ideal mode of selection would be disastrous to the Fund. That fund was initiated and supported by a comparatively small community, which, so far as pecuniary circumstances went, was feeble compared with many other bodies. Though small in number, it was separated in many ways. The subscribers consisted of members of the Society and non-members, and that fact was most important to bear in mind. For twenty-six years the subscribers had been appealed to on a purely catholic basis, and subscriptions had been obtained from all classes, members or not, some being entirely unconnected with pharmacy, and in fact a great deal of help was sometimes obtained from outsiders who were interested in candidates. Many of these people were not entirely in sympathy with the action of the Council, and some were to a certain extent antagonistic. At the last election there were eight candidates, and of the four elected, one had [illegible] connected with the Society and three had [illegible] while of the four unsuccessful ones, three [illegible] been subscribers and one had not. Those [illegible] had supported this motion had shown to [illegible] extent that their sympathies were rather in favour [illegible] those who had been connected with the Society [illegible] had subscribed to the Fund, and there was a [illegible] bias in all members of the Council in that direction but in the interests of the Fund it had to be [illegible] If the last election had taken place in the way [illegible] Hampson indicated, it was very doubtful if the [illegible] would have been the same; and he feared it would only lead to continual criticism of the Council, and to pressure being brought to bear on individual members.

The President said he thought perhaps the discussion might now close. Of course, Mr. Hampson would not be convinced by what had been said, but he thought the Council would be wise in not voting for this proposition. Practically, the first part of it was a truism, and they all sympathised to a great extent with his idea, but he had delivered it in the wrong place. The people to whom he should go were the subscribers, not the trustees who had to dispense the Fund. He objected, as a trustee, to be asked to make this gigantic experiment. By the Act of Parliament the funds of the Society were placed out, under conditions then as now existing, for the benefit of all chemists and druggists, whether connected with the Society, or subscribers, or not. If the persons who found the money came to the Council and said we think this is a cruel way of election, and we will leave you to do it, it would be a different thing. In practice what did it come to? Mr. Hampson had made a great deal of the candidates having friends. If a candidate at the top of the list in an election of this sort were the only person who won there would be much more force in his arguments, but they lost a great deal of their significance when it was remembered that 10,000 votes might be given to a candidate, when 2000 would have ensured his election, so that there were always a number of votes wasted. It was not like a horse race, where there were first, second, and third prizes, but out of eight people four were elected, and their relative positions on the poll did not affect the amount of their respective annuities. Since Mr. Hampson first brought a similar proposition before the Council, a certain change in the method had been introduced, and the Committee now exercised the first benevolent operation of bringing before the Council the most deserving cases. They did not, as was seen in some institutions, bring an enormous list with a small number to be elected, but very often there were only perhaps six or seven candidates for four places, and there was a certainty that an unsuccessful candidate would get a grant during the next succeeding year, and an almost equal certainty that he would be elected the second year. Would the great mass of subscribers whose personal interests were elicited annually willingly alter that principle because it cost a certain amount of money? He would repeat that there was rarely a third application. They all knew the benevolent spirit which animated the Treasurer, and for which they had the highest possible respect, but he must allow him to say he was impracticable. The management of a charity was a matter of business, and they, as business men, had to conduct this great business as trustees. He hoped Mr. Hampson would not press the motion, which would vest the power of election in the Council. Now, of all the things on which he prided himself in that Society, one was the fact that as far as possible they decentralised, and the Society was democratic in its widest extent. The subscriptions came from all parts of the kingdom, and even from abroad, and the subscribers received their voting papers, but Mr. Hampson asked them to centre all the power in the Benevolent Fund Committee and the Council. Did he not suppose that there were plenty of men who, being interested in a candidate, would write letter after letter, and put pressure on the President, the Vice-President, and every member of the Council and Committee to advance his friend's interest? There would be greater abuses than those now complained of, and it would be a most difficult duty for the members of the Council to discharge. Every man who took an interest in his candidate would naturally think he was the best, and there would be representations and deputations, and the whole thing would be a fiasco. He was satisfied that the administration of the Fund was the nearest approach to perfection which was possible in the case of a fund which must be popular to be successful.

Mr. Hampson, in reply, said he ought no doubt to feel crushed, but he must say he was not in any way moved by the arguments of the President, some of which he considered entirely fallacious; but there was one point he should like to touch upon. It seemed very strange to him that any member of the Council should hesitate to undertake the duty which this resolution would put upon him. The President suggested that he had brought it to the wrong place, but he thought it was the best possible place, inasmuch as it gave it publicity; their friends outside would have an opportunity of reviewing the arguments on each side, and he would take that opportunity of appealing to the subscribers to think over the matter, and to help him at some future time to remove what he was convinced was a great abuse.

The motion was then put and negatived.

### Pharmacy Acts Amendment Bill.

The President said a letter had been received from the Western Chemists' Association of London, enclosing the following resolution, which was passed at a meeting held on April 18:—

> "This Association cordially approves the draft Pharmacy Act Amendment Bill recently adopted by the Pharmaceutical Council, with the exception of the words in clause 3, limiting the number of representatives on the Council of members who are not on the Register of Pharmaceutical Chemists, being strongly of opinion that any limitation of equality of representation would injuriously affect that unity it is so desirable to promote, and therefore no such limitation should be placed upon any qualified member of the Society being elected to the Council."

The clause referred to dealt with the election of the Council, and provided that the Council should not at any time contain more than ten members who were not on the register of pharmaceutical chemists. The clause in the present Act was that there could be only seven. During the discussion on the Bill a few years ago this matter was carefully considered, and the conclusion arrived at was that this arrangement was a proper one, and when he had gone to different parts of the country to listen to the objections to that Bill, he did not remember any objection being raised to this clause. It was, therefore, embodied in the present Bill without further discussion. The Western Chemists' Association proposed that every person who had passed the qualifying examination should in future stand on an equal footing in this matter. In the ordinary way the communication would be sent to the Law and Parliamentary Committee, and perhaps that would be the best way of dealing with it.

Mr. Hampson moved that the matter be so referred.

Mr. Harrison seconded the proposition, pointing out that this would give an opportunity in the meanwhile of eliciting the opinion of the members at the annual meeting.

Mr. Schacht said he would have preferred a discussion on the matter at once, and as he was not present when the matter was discussed before, he would like to give his reasons for endorsing the decision arrived at by the Council, as embodied in the present Bill. The moderate alteration from seven chemist and druggist members, as it now existed, to ten, seemed to him a reform without a revolution. Referring to the registration, one of the important purposes for which the Society was incorporated was that it should preserve among its fundamental purposes that of advancing chemistry and pharmacy. That ought to be considered as a trust, and it must not be forgotten that those most likely to advance chemistry and pharmacy were those most advanced in chemistry and pharmacy themselves.

Mr. **Bottle** thought this was a question of principle, and was rather for the Council than for the Committee to decide.

After some further discussion, the motion to refer the communication to a committee was put to the vote and carried.

A communication was also received from the Secretary of the Chemists' Assistants' Association, conveying a resolution expressing approval of the draft Pharmacy Acts Amendment Bill.

### Report of Examinations.

*April*, 1894.

| | Candidates Examined. | Candidates Passed. | Candidates Failed |
|---|---|---|---|
| England and Wales:— | | | |
| Major | 32 | 17 | 15 |
| Minor | 249 | 83 | 166 |
| Total | —281 | —100 | —181 |
| Scotland:— | | | |
| Major | 3 | 1 | 2 |
| Minor | 115 | 38 | 77 |
| Total | —118 | —39 | —79 |

*First Examination.*

| Examined. | Passed. | Failed. |
|---|---|---|
| 427 | 190 | 237 |

Twenty-eight certificates by approved examining bodies were received in lieu of the Society's examination.

### Carbolic Acid.

The **President** said some time ago a resolution was sent to the Privy Council recommending that carbolic acid should be placed in the schedule of poisons. No answer had been received to that communication, but in reply to a question recently put in the House of Commons by Mr. Macdona, the Vice-President of the Privy Council intimated that their Lordships did not intend to approve of the resolution.

### Report of the General Purposes Committee.

The first portion of the report of this Committee included the reports from the Professors on the Prize Examination, of which the following is a summary:—

*Practical Chemistry.*

Professor **Attfield** reported the names of the successful competitors, and stated that the awards had been made on (*a*) the daily work of the pupils; (*b*) the answers given in revision classes and weekly examinations; and (*c*) a special terminal examination.

*Chemistry.*

Professor **Dunstan** bore testimony to the diligence and regularity of his class, and stated that twenty-five entered for the terminal examination, the large majority of whom sent in very creditable papers.

*Botany.*

Professor **Green** reported that there were five candidates for the prize, and that the work of the first five was very satisfactory.

*Materia Medica.*

Professor H. G. **Greenish** reported thirty-seven students in his class, and that the work had been well sustained, but the average progress made was not quite so good as last year. Twenty-one competed for the prize.

*Pharmacy and Practical Pharmacy.*

Mr. **Ince** reported thirteen candidates in this examination, of whom two were not subscribing "Students of the Society," and one was ineligible through having attended more than one session.

On the motion of the President, the above portion of the report was unanimously adopted.

In accordance with the above reports, the following awards were recommended:—

**Practical Chemistry.**

*Bronze Medal* ...............Charles John Taylor.
*Certificates of Honour*... { Aubrey Thomas Hill. / Charles Edmund Ashby.

**Chemistry and Physics.**

*Bronze Medal* ...............Charles John Taylor.
*Certificates of Honour* ... { Thomas Anderson Henry. / Aubrey Thomas Hill.

**Botany.**

*Bronze Medal* ...............Aubrey Thomas Hill.
*Certificates of Honour*... { Charles John Taylor. / Charles Edmund Ashby.

**Materia Medica.**

*Bronze Medal*..................Thomas Anderson Henry.
*Certificate of Honour* ......Aubrey Thomas Hill.

**Pharmacy and Practical Pharmacy.**

*Bronze Medal* ..............Aubrey Thomas Hill.

The legal portion of the Committee's report included the usual letter from the solicitors, stating the progress made with cases placed in their hands. Several defendants had paid penalties, and some cases are still awaiting trial. Reference was also made to the patent cases, and to the appeal in Armson's case, reports of which have appeared in the Journal. A number of fresh cases of infringement of the Act were reported to the Committee, and in each case proceedings were recommended.

A person in Liverpool who applied for registration in July last, but who failed to satisfy the Registrar of the validity of his claim, had appealed to the Council against the Registrar's decision. The Committee had examined the papers and correspondence, and recommended that the appeal be not entertained.

The Council went into committee to hear and consider this portion of the report.

On resuming, the report and recommendations were received and adopted, and special resolutions were passed authorising the Registrar to take proceedings against the persons named therein.

The Council then went into committee to finally revise the annual report, which was ordered to be published in the Society's Journal and Transactions (see page 913).

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## FIRST EXAMINATION.

*April* 10, 1894.

### RESULTS.

A meeting of the Board of Examiners for England and Wales was held on Tuesday, May 1st.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

| | |
|---|---|
| Brown, Algernon G. | Bourne. |
| Houghton, Herbert | Huddersfield. |
| McBride, Wm. Alexr. W. | Luton. |
| Owles, David H. | Ellesmere. |

The Report of the College of Preceptors on the Examination held on April 10th was received.

*Four hundred and twenty-seven* candidates had presented themselves for examination, of whom two *hundred and thirty-seven* had failed.

The following *one hundred and ninety* passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students :—

| | |
|---|---|
| Adamson, James Johnston | Montrose. |
| Adamson, William Peter | Dundee. |
| Alcock, Alfred Henry | Sheffield. |
| Allan, Alexander | Glasgow. |
| Anderson, William George | Forres. |
| Andrew, John Reginald | London. |
| Appleyard, Charles Percival | Bradford. |
| Armstrong, Arthur Graham | Keswick. |
| Armstrong, Henry Swan | Dumfries. |
| Arrowsmith, William | Whitstable. |
| Baker, Edgar Thomas | Worcester. |
| Banks, George | Wick. |
| Bellamy, William Arthur | Barnsley. |
| Billington, Thomas Herbert | Liverpool. |
| Bissacre, Ernest James | Tunbridge Wells. |
| Booth, Fred Souter | Dundee. |
| Bowers, Thos. Edwin Sefton | Chester. |
| Bracewell, John Wm. Robinson | Keighley. |
| Breese, Andrew | Carno. |
| Brettelle, Frank | Manchester. |
| Brickell, Ethelbert Richard | Worcester. |
| Bruce, Forbes | Aberdeen. |
| Bugden, Harold Charles | London. |
| Bullard, Archie | East Dereham. |
| Bunting, Sydney | London. |
| Cabannes, Casimir Louis | Skegness. |
| Cameron, Andrew | Inverness. |
| Carr, Hugh Livingstone | Newcastle-on-Tyne. |
| Center, William | Edinburgh. |
| Chabôt, George Lewis | London. |
| Chew, James K. | Blackpool. |
| Ching, Sidney | Brighton. |
| Clark, Henry Burton | Gloucester. |
| Clarke, Henry Harold | Hereford. |
| Clegg, Aldhelm | Manchester. |
| Collins, Alfred | Halifax. |
| Copley, William Dawn | Long Eaton. |
| Cosh, Arthur L. Strode | Bath. |
| Cowham, Oswald Wharrie | London. |
| Cowie, Peter | Edinburgh. |
| Cox, William James | Brierley Hill. |
| Craig, Thomas Forrest | Kelso. |
| Crookham, Harry | King's Lynn. |
| Cushing, Thomas Edward | London. |
| Dalton, Ernest | Sheffield. |
| Dannatt, Philip | Hull. |
| Davies, David Morgan | Carmarthen. |
| Davies, Thomas | Carmarthen. |
| Deal, William Henry | Southampton. |
| Dewar, Donald | Portree. |
| Dixon, Ernest Albert | Ripley, Derby. |
| Docker, James | Greenock. |
| Domaille, William | Bristol. |
| Dunston, Albert Ernest | Farnham. |
| Eggett, Louis Charles | Burnham-on-Crouch. |
| Elliott, Fredrick William | Mansfield. |
| Estlick, Charles Tippett | Truro. |
| Fairbairn, Alexander | Jedburgh. |
| Fann, Charles Montague | Grimsby. |
| Farquhar, James | Insch. |
| Faull, William Henry | London. |
| Feltwell, Charles Edward | London. |
| Ferrier, James Peebles | Dundee. |
| Foote, Edmund George | Waltham Abbey. |
| Forster, John Hall | Newcastle-on-Tyne. |
| Gair, Duncan | Inverness. |
| Gibb, William | Kirkcaldy. |
| Gibbs, Harold Rodier | Birmingham. |
| Graham, John Hewlett | Oxford. |
| Greening, Ernest Harcourt | Dorchester. |
| Halstead, Harold Broughton | Rawtenstall. |
| Harrison, John | Cudworth. |
| Harrold, Arthur Edgar | Frome. |
| Harvey, John Kentish | Louth. |
| Henshaw, William Herbert | Macclesfield. |
| Hird, Reuben | Egremont. |
| Hobbs, Henry Allmond | Burnham, Somerset. |
| Holmes, Alexander | Greenock. |
| Howard, Robert Wilson | Castle Douglas. |
| Hughes, Martin Smith | Flint. |
| Hume, Ernest N. Webb | Lowestoft. |
| Jackson, William Frederick | London. |
| James, William Alfred | Avebury. |
| Jamieson, Martin | Edinburgh. |
| Jasper, William | Plymouth. |
| Jelley, John William | Pendleton. |
| Jenkins, John Andrew | Bridgend. |
| Jones, Hugh | Llanfairfechan. |
| Jones, Ivor Owen | Llanrwst. |
| Junor, Alexr. Rose | Inverness. |
| Kilner, Thomas Charlesworth | Listerhills. |
| Lambert, Joseph William | Whitby. |
| Lambley, Fredric Charles | Blackheath. |
| Lee, Geo. A. McLean | Fraserburgh. |
| Lewis, Frank Richard | Abergavenny. |
| Lewis, Maud Marie | Cardiff. |
| Liley, George | Hanley. |
| Lister, Herbert James | London. |
| Lloyd, Percy Ernest | Twickenham. |
| Longmire, Frederick | Carlisle. |
| Low, Joseph | Edinburgh. |
| Lunn, Thomas Wilmot | Worcester. |
| Lunt, Godfrey Fairbairne | Manchester. |
| McKensie, Thomas Macindoe | Larkhall. |
| Macsween, Alexander | Leith. |
| Maddison, Thomas William | Hebburn-on-Tyne. |
| Main, Charles Sinclair | Crosby. |
| Martin, Edwin George | Ingatestone. |
| Martin, Harry | Whalley. |
| Matcham, Alfred | Beccles. |
| Mathias, Wm. Morse Beynon | St. Clears. |
| Mellor, William Gilbert | Warwick. |
| Moody, Thomas Adam | London. |
| Moorhouse, George Henry | Burnley. |
| Morgan, John | London. |
| Murdoch, James | Glasgow. |
| Murdoch, John G. | Edinburgh. |
| Murray, Thomas Ninian | Workington. |
| Needham, Joseph Henry | Blackburn. |
| Nicholson, Hugh Aird | Carnoustie. |
| Nightingale, Donald Archer | London. |
| Oliver, Seth Harry | Shebbear. |
| Oliver, William Jaques | Edinburgh. |
| Parker, John Thomas | Haworth. |
| Parry, John Robert | Clwt-y-bont. |
| Paterson, Andrew | Edinburgh. |
| Peacock, Rudolph | London. |
| Pearce, Robert Edgar | Newquay. |
| Perry, Wallis Bennett | Basingstoke. |
| Pettifer, Frank | Leighton Buzzard. |
| Phelps, Alfred Henry | Hucknall Torkard. |
| Pirie, Alexander | Aberdeen. |
| Potter, Herbert | Oxton. |
| Rayner, Charles | Uxbridge. |
| Rickard, Albert Henry | Aylesbury. |
| Roberts, Edward Ingman | Wrexham. |
| Robertson, Alexander | Dundee. |
| Robertson, Archibald | Glasgow. |
| Rogers, Edward Parsons | Cheltenham. |
| Rowland, Geo. Howard Chas. | Matlock Bath. |
| Rushton, William Burton | Walkden. |
| Seaborne, Eric Stanley | Barnsley. |
| Shreeve, George James | Lowestoft. |
| Simpson, Alexr. George | Elgin. |
| Simpson, John Andrew | Worcester. |
| Sleigh, Fredk. Bentley | Walsall. |
| Smeall, William Francis | Jedburgh. |
| Smith, Ernest | Barnard Castle. |
| Smith, John Clayton | Coven. |

| | |
|---|---|
| Smith, John Herbert | Low Moor. |
| Smith, William Thomas | Ryde. |
| Snell, Edmund Henry | London. |
| Spilman, John James | Ripley, Yorks. |
| Stedman, Charles Richard | London. |
| Stewart, Charles | Edinburgh. |
| Stewart, Gordon Orr | Glasgow. |
| Stewart, John Sutherland | Auchterarder. |
| Storey, William | York. |
| Sutton, Robert Howson | Lancaster. |
| Symon, James Grigor | Fraserburgh. |
| Taylor, Alexander | Cullen. |
| Taylor, Thomas John | Ormskirk. |
| Thrackray, Charles Fredk. | Leeds. |
| Thursfield, Robert Charlton | Sunderland. |
| Tristram, Ernest William | Manchester. |
| Turner, Algernon | Shebbear. |
| Varah, Simpson Taylor | Brigg. |
| Wadlow Ernest Harry | Bridgnorth. |
| Wakefield, Frank Banks | London. |
| Walker, Bernard | Gainsborough. |
| Walmsley, Ernest William | Marple. |
| Ward, Edith Mary | Newcastle-on-Tyne. |
| Warren, Sydney Baker | Wellingborough. |
| Wellington, Chas. John Rean | Fowey. |
| Wheeldon, Leopold | Manchester. |
| White, Charles Edwin | Bournemouth. |
| White, Robert S. | Halifax. |
| Winckler, Ernest | London. |
| Williams, William Eleder | Kilgerran. |
| Willock, Horatio Ernest | Tutbury. |
| Wingfield, Thomas Arthur | Bolton. |
| Wilson, Thomas Harrison | Maryport. |
| Wilson, William Smith | Edinburgh. |
| Wolfe, Hermann | Sunderland. |
| Wood, William Frost | Arnold. |
| Woodall, Robert Thomas | Lincoln. |
| Woodcock, Walter E. B. | Norwich. |
| Woolldridge, Thomas | Chatham. |
| Young, Alexander | Wishaw. |
| Young, John A. M. | Airdrie. |

The questions set at this examination were published in the *Pharmaceutical Journal* for April 14, p. 865.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

| | Candidates. | | | | Candidates. | | |
|---|---|---|---|---|---|---|---|
| | Examined. | Passed. | Failed. | | Examined. | Passed. | Failed. |
| Aberdeen | 19 | 6 | 13 | Lancaster | 1 | 1 | 0 |
| Aberystwith | 2 | 0 | 2 | Leeds | 20 | 10 | 10 |
| Birmingham | 20 | 5 | 15 | Lincoln | 7 | 3 | 4 |
| Brighton | 4 | 2 | 2 | Liverpool | 17 | 7 | 10 |
| Bristol | 9 | 6 | 3 | London | 51 | 29 | 22 |
| Cambridge | 4 | 1 | 3 | Manchester | 34 | 15 | 19 |
| Canterbury | 4 | 1 | 3 | Newcastle-on-T. | 14 | 6 | 8 |
| Cardiff | 10 | 3 | 7 | Northampton | 1 | 1 | 0 |
| Carlisle | 19 | 6 | 13 | Norwich | 11 | 5 | 6 |
| Carmarthen | 6 | 4 | 2 | Nottingham | 10 | 6 | 4 |
| Carnarvon | 5 | 3 | 2 | Oxford | 2 | 1 | 1 |
| Cheltenham | 5 | 3 | 2 | Penzance | 2 | 1 | 1 |
| Darlington | 5 | 1 | 4 | Peterborough | 2 | 0 | 2 |
| Dundee | 13 | 6 | 7 | Plymouth | 9 | 4 | 5 |
| Edinburgh | 34 | 15 | 19 | Sheffield | 9 | 5 | 4 |
| Exeter | 4 | 1 | 3 | Shrewsbury | 6 | 3 | 3 |
| Glasgow | 30 | 9 | 21 | Southampton | 13 | 5 | 8 |
| Hull | 5 | 3 | 2 | Worcester | 5 | 4 | 1 |
| Inverness | 10 | 7 | 3 | York | 5 | 2 | 3 |

# Proceedings of Societies in London

## CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, April 19, t President, Mr. E. F. Harrison, in the chair, a pap was read by Mr. C. E. Sage on "Rectified Spirit."

After this had been discussed, Mr. R. H. Jo opened a discussion upon the Draft Pharmacy A Amendment Bill. He said when subjects touchi upon pharmaceutical or trade politics had been unde discussion in that room, a certain temerity cou usually be detected, and doubts as to the propri of assistants venturing to assert their views we frequently raised. This, he thought, was a very gre mistake. According to the interest taken by th younger men in the questions affecting the trad now, would they in the future obtain active su porters or men who would stand aloof in a measures brought forward for the trade benefit.

Apparently the main object leading to the int duction of the Bill had been that of securing th consolidation and union of the trade, but they mu not expect too great results in that direction. The were too many men who, having qualified, were qui oblivious of the fact that it was their duty to carr themselves under the Society's wing. The fact tha they could have no vote for the Council was wit many a sore point, and the advantages offered by the Society in its Museum and Library, by the circulation of its Journal, and the claim of its past work, were disregarded, and they said they would wait until they went into business before joining. These men, holding aloof for some time, became more and more impregnated with the small-mindedness which the conditions of the trade developed, and with their own self interests, so that when they were able to become proprietors they did not fulfil their obligations. In the future a good many men who would not join under the present conditions would doubtless do s but of the associates now holding aloof but a small proportion would come in, and ten to twenty years would probably elapse before there would be an significant increase in the strength of the Society from this cause.

The most favourable point connected with the Bil was the foresight displayed in drawing it up. Its clauses were simple, and nothing had been introduced into it of a controversial nature. There was nothing to excite outside hostility, and it was to be supposed that there would be no expression of opposition from inside their ranks. The Major man did not aspire to his higher qualification in order to be able to call himself a member, but for the sake of the additional training the higher examination entailed, and it migh be put down that his good sense would be sufficie enable him to be the heartiest supporter of the Bill.

The project was not new. It was introduced in 1883, and again in 1891, in different, but more obje tionable forms, and with measures of greater impo ance attached. The failures to secure the adop or at least the promotion of those bills were enti due to the contentious matters in them, and th might take it to be the intention of the Council wh initiating legislation in the future to keep contentio and non-contentious matters in different bills.

In conclusion, he asked them to adopt the follow resolution, of which he moved that a copy be sent the Secretary of the Pharmaceutical Society for p sentation to the Council:—

"That this meeting of the Chemists' Ass Association welcomes with pleasure the promo a bill to secure for all who are qualified to pra chemists and druggists the rights of membe e Society, and trusts that the Council will spare no fort to secure its adoption."

Mr. Long seconded the proposition, and said he ought the Bill would do much to secure a more presentative body. All qualified men, whether in siness or not, ought to have a voice in the Council otion.

Mr. Sage asked if the resolution was in order, as the mbers had not all been notified that the discussion s to take place. The President, however, ruled that was in order, and Mr. Sage, continuing, asked if the bscriptions of all members would be uniform, d if so, how far had this proposed increased revenue luenced the Council in their deliberations upon the ll.

Mr. Gane thought that as the Bill was not likely to efit pharmacy for some years to come, the Council ght very well include some measures for trade form and regulation, and he proposed that a clause added to the motion before the meeting to that ect.

Mr. Jones having agreed to this addition to his prosition, it was included in it, and the new motion was oposed by Mr. Gane, and seconded by Mr. Chastin.

Mr. Plant spoke against the amended motion,

In putting which the President said that there emed to be an awakening among the trade at esent, as shown by the proposed federation and in her ways; and what was wanted was that chemists d druggists should be able not only to develop and press their views in private associations, but also to e practical outcome to them by having a voice in e government of the Pharmaceutical Society. He lcomed the Bill as putting the Society on a more mocratic basis, and thought it a pity to add to the solution any reference to other reforms; the Society st first get a strong backing, as they hoped to by s means, and then they could attempt other things th better chance of success.

The voting for and against the amended resolution ing equal, the President gave his casting vote ainst it.

It was then proposed by Mr. Morgan, and seconded Mr. Moffatt, that the motion as put by Mr. R. H. nes in the first place be adopted, and this being put the meeting was carried *nem con.*

The proceedings then terminated.

## Provincial Transactions.

### THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

In connection with the assistants' section of this sociation a successful concert was held on Wednes y, April 25, at the Imperial Hotel, Millbay Road, ymouth. It was decided that after the expenses re paid the balance should be sent to the Benevo nt Fund of the Pharmaceutical Society.

## arliamentary and Law Proceedings.

### POISONING CASES AND INQUESTS.

#### Child Poisoned by Dover's Powder.

Mr. D. Wightman, coroner, held an inquest on April , at the Midland Station Hotel, Pond Street, effield, on the body of Joseph Bramwell, aged four onths, son of Harry Bramwell, tobacconist, of 149, ond Street, who died on Monday.

Harry Bramwell, the father, said the child had not en healthy since birth, suffering very much from arrhoea. Deceased was very ill on Thursday, and at dinner time on Saturday he was recommended by a young medical friend to give the child half a Dover's powder. Witness purchased one from Mr. Goucher, chemist, Howard Street, and his wife gave the child half of it. The child immediately became drowsy, and they were unable to arouse him. Witness sent to the chemist to ask what the proper dose was for a child, and Mr. Goucher sent word back that they were not to give him any, as it was not a fit medicine for him. The child continued in an unconscious condition, and died early on Monday morning. The father, in reply to the coroner, said when his young medical friend recommended him to give the child the powder he quite thought it was a proper medicine for the baby. He did not tell the chemist that it was for a child. Replying to a juryman, witness said he was of the opinion that Mr. Goucher gave him the powder under the impression that it was for an adult.

Mr. W. H. Fordham, surgeon, said he saw the child on Sunday, when it was in a state of collapse, and appeared to be suffering from a narcotic, probably opium. Mr. Fordham added that a Dover's powder could not be given to a strong, healthy child with impunity. He had the other portion of the powder in his possession, and it contained one grain of opium, which would be an exceedingly dangerous dose for a child such as the deceased.

Mr. L. T. Goucher, chemist, of Howard Street, said he remembered selling the Dover's powder to Mr. Bramwell on Saturday. Mr. Bramwell did not say who it was for, neither did witness ask him, thinking Mr. Bramwell was buying it for himself. There were no directions nor label on the paper containing the powder. He made the powder himself from the directions in the Pharmacopœia, and the one he sold Mr. Bramwell contained a grain and a half of opium. He quite agreed with Mr. Fordham that half the powder was a dangerous dose to give a child, and would probably cause death. He had never yet put a label on a Dover's powder, but said he should never sell another powder without a medical man's order. He thought it would be safer if the powders were labelled. They were only given to adults, and he had never before sold one for a child.

The coroner said he thought the system of selling Dover's powders without either label or directions indiscriminately to anybody who came for them, without asking who they were for, was very dangerous. There was no doubt the powder had been inadvertently given to the deceased, and he thought the jury would do a great deal of good if they would add something to their verdict, expressing their opinion about the sale of such powders.

The jury returned a verdict that the child died from opium, inadvertently administered in a Dover's powder, and added a rider, saying that the sale of Dover's powders without label or directions was very dangerous, and ought to be discontinued.—*Sheffield Daily Telegraph.*

#### Death after Injection of Morphine.

The adjourned inquiry into the death of Mr. Henry Thornton Williamson Munroe, brassfounder, of the firm of Shipham and Co., Hull, was held on April 27, before Mr. Jennings, coroner, at the Cross Keys Hotel. Mr. Pearce, solicitor, of Hull, watched the proceedings on behalf of the family of the deceased, and Mr. Holt, of Manchester, solicitor, on behalf of Mr. Fields, chemist, who, it transpired at the previous hearing, had, at the request of the wife of the deceased, injected morphine into him the night before his death (see p. 909). The evidence of Dr. Walker and Dr. Park, who had made the post-mortem examination, was to the effect that the brain and the internal organs of the deceased were much congested, and he had a gouty heart. The coroner stated that he had received a report from Mr.

Baynes, of Hull, to whom the stomach had been sent for analysis, stating that he had found no trace of morphine. In reply to the coroner, Dr. Walker stated that there had been sufficient time for the morphine to become absorbed into the system. He believed that death was caused by the congested state of the internal organs of the deceased, and it was probable that in his condition the injection of morphine accelerated death. In cross-examination, Dr. Walker said in all probability the deceased would have died if morphine had not been administered. In this Dr. Park concurred. Mr. Fields volunteered a statement as to why he had administered the morphine. Had he known the state in which the deceased was he would certainly not have done it. As a friend of the deceased, he would sooner have sacrificed his right hand than done him any harm. In summing up the case, the coroner commented on the straightforward and truthful way in which Mr. Fields had given his evidence throughout. The jury returned a verdict of "Death from natural causes."—*Eastern Morning News.*

### PRESCRIBING BY A CHEMIST.

Mr. Luxmore Drew held an inquest on Wednesday, April 25, on the body of Nora Collins, aged one year and nine months, daughter of a labourer, living at 3, St. James' Place, Notting Dale. Mary Collins, mother of deceased, said that the infant had been in good health up to about a week ago, when she noticed that it had a bad cough, and as it did not seem to get better, on April 20 she took the child to a chemist in Princes Road, Notting Hill, who gave her some medicine and something to rub on its chest. On the Sunday it got worse; she took it to Mr. Baker again, when he advised her to put a poultice on its chest, and said she had better send for a doctor, as it was very ill. Mr. Baker, a chemist, residing in Princes Road, Notting Hill, stated that the mother brought the child to him; it was suffering from a cough, and he gave her medicine and liniment to rub on its chest. Witness admitted he was doing wrong in undertaking the case of a child without a doctor seeing it, and said he was sorry. Dr. Fletcher said that he had made a post-mortem examination, and found the child had extensive pneumonia. In his opinion a doctor should have seen it in the first instance. The cause of death was pneumonia. The jury returned a verdict of natural causes, and added the following rider:—"That the jury further say that a qualified medical man should have been called in in the first instance, and they considered that the chemist exceeded his duty in undertaking the care of the child."—*Kensington News.*

### DEATH FROM EXCESSIVE USE OF LAUDANUM.

Mr. Whiston held an inquest at Ilkeston, on April 26, touching the death of Jane Paxton, aged 48 years, a confirmed laudanum drinker. Dr. Potter stated that death was due to failure of the action of the heart, which might have been caused by the excessive use of laudanum. The jury returned a verdict of "Death from syncope produced by the excessive use of laudanum."—*Sheffield Independent.*

## Obituary.

Notice has been received of the death of the following:—

On April 10, James Martin, Chemist and Druggist, Motherwell. (Aged 51). Mr. Martin was an Associate in Business of the Society and Local Secretary for Motherwell.

On April 14, Edward C. Smith, Chemist and Druggist, of Repton.

On April 18, Edwin Buckland, Chemist and D[illegible]gist, of Sutton-in-Ashfield. (Aged 63). He [illegible] member of the Society, which he joined in 1872.

On April 23, Charles Stringer, Chemist and D[illegible]gist, of Hull. (Aged 89).

On April 23, George Walker, Chemist and Drugg[illegible] of Liverpool. (Aged 67). Mr. Walker had been [illegible] business upwards of forty years in Liverpool, wh[illegible] his quiet, unostentatious manner secured him univ[illegible] esteem. He had been a member of the Society si[illegible] 1882.

On April 24, Edward Jones, Pharmaceutical C[illegible]mist, of Camberwell. (Aged 50).

On April 26, John Sadleir, Pharmaceutical Ch[illegible] of Gloucester. (Aged 67). Mr. Sadleir was a me[illegible] of the Society, and was until last year Local Sec[illegible] for Gloucester, when the state of his health comp[illegible] him to relinquish the office.

On April 27, Alexander Hemingway, Chemist a[illegible] Druggist, of Portman Street, W. (Aged 80). Mr. He[illegible]ingway joined the Society in 1843, and for [illegible] years took an active part in pharmaceutical politics.

On April 28, William Smith, Pharmaceutical Ch[illegible]mist, of Bridlington. Mr. Smith's year of member[illegible] dates from 1853.

## Correspondence.

### THE PROPERTIES OF PURE ACONITINE.

Sir,—There are three points in Professor Dunstan's letter which require notice:—(1) Physiological evidence, (2) Rotation test, (3) Melting point.

(1) In the lecture delivered last year Professor Dunsta[illegible] made the following statement:—

> The facts we have recorded serve to establish the prop[illegible] of pure aconitine, and since Professor Cash, F.R.S., of [illegible] University of Aberdeen, has found this substance to [illegible] excessively poisonous, exhibiting in a highly concen[illegible] form the characteristic physiological effects of the [illegible] there can be no doubt that the alkaloid having the [illegible]perties recorded above is the only substance which [illegible] in future be used in medicine as "aconitine." In th[illegible]nection, however, a few words of caution are necessary. [illegible] is quite certain that this alkaloid is far purer than [illegible] specimen of aconitine which has hitherto been used th[illegible]peutically, and Professor Cash tells me that it is cert[illegible] the most powerfully toxic specimen he has ever met w[illegible] It would therefore be unsafe to dispense it in the [illegible] doses as have been customary with the impure specim[illegible] commerce.—*Pharm. Journ.*, iii., 766.

Surely the whole foundation of this statement is ph[illegible]logical experiment. It is, therefore, somewhat ast[illegible]ing to read in Professor Dunstan's recent letter:—

> I am not surprised to find that Professor Cash could [illegible] detect any appreciable difference between the two [illegible]mens. I have nowhere suggested the determinatio[illegible] toxic or therapeutic action as a test for the purity of [illegible]tine, nor do I believe that our present physiological [illegible] with which I am well acquainted, are competent to [illegible]tinguish between different degrees of purity of [illegible] excessively active substance as aconitine, except wh[illegible] impurities are present in relatively large quantity.

I have no doubt at all about the accuracy of Pr[illegible] Cash's statement, that "it is certainly the most p[illegible]fully toxic specimen he has ever met with;" but the [illegible] of that statement depends largely upon the samples [illegible] he had then seen. Professor Dunstan, however, [illegible] much further by leading one to suppose that [illegible] approaching his pure sample had ever been used com[illegible]cially; and that is the point which still appears [illegible] questionable.

(2) With regard to the dextro-rotation of [illegible] it is admitted by Professor Dunstan that [illegible] impurity of the specimen described in the 'Com[illegible] 1890, was small," and therefore it would not be [illegible]ing that, in addition to its other characters, it sh[illegible]duce dextro-rotation of polarised light. But Pr[illegible] Dunstan in his lecture did not even hint that [illegible] rotatory power—possessed also by aconine and [illegible] —should or could be used for the identification of [illegible]tine, and on reference to his paper in the *Journal* [illegible]

*emical Society* it does not look very promising. ofessor Dunstan in his lecture gave the solubility of onitine in alcohol as 1 in 37 at 22° C. (71°·65 F.); and he tes (*Journ. Chem. Soc.*, 59, 281) that a 3 per cent. c) alcoholic solution gave a rotation of +11·01, another termination gave +11·1, while a third gave +10·47. hese differences may be trivial, but it must be rememred that the only time he has emphasised dextro-rotaon as a characteristic of aconitine has been in reference my sample (admittedly almost pure).

(3) Professor Dunstan in the last part of his letter kes exception to my reference to the alteration of e melting point, and says that the difference between 8°·5 and 190° C. has "no significance." I am quite of at opinion myself, but would have expected Professor nstan to attach considerable importance to that ference in the melting point, since there is but tle difference between the melting point of ofessor Dunstan's pure aconitine and the melting int of the aconitine which he could have purchased from erck any time during the last six or more years. It pears, therefore, to be sufficiently proved that at the me of Professor Dunstan's lecture, and even in 1889, ere did not exist such a difference between commercial ystalline aconitine (readily obtainable) and his pure prot as could justify the description I have quoted in the st part of this letter.

*413, Oxford Street, W.* P. W. SQUIRE.

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### A LONDON CLUB FOR PHARMACISTS.

Sir,—In reference to the above, as recently suggested "G. H. G." in the Journal, I see no reason why it should t become an established fact, being worthy of the supt and appreciation of all concerned, as I think such an stitution would be most acceptable, and prove a perfect on to all connected with pharmacy, many of whom, am inclined to think, must have at various times felt the ant of a place of this description, where they might spend social and pleasant evening in company with members of eir own craft. Ofttimes have I experienced this want hen visiting the metropolis. I trust this matter will ceive the consideration of those influential members consted with the Society who are better able to formulate e ways and means of bringing it to a successful consion.

PHARMACIST.

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### ESSENTIAL OIL OF NUTMEG.

Sir,—In the course of recent experiments on nutmeg oils, th of English and foreign distillation, several samples of ferent imports of the latter have come under observan. One sample differed so much from other specimens cently or previously examined that an investigation of purity was specially interesting. For the purposes of is note I have styled this particular oil as 1, and for mparison I have termed two other samples of oil of eign distillation as 2 and 3, and to make comparisons mplete, I have added a fourth sample, 4, which was of glish distillation. The solubilities of the oils differed eatly, 1 being partially insoluble in alcohol of 94 per nt. by volume in every proportion, whilst 2, 3, and 4 were adily soluble even in their own volume of alcohol of milar strength. The specific gravities were most riable; 1 had a specific gravity of ·955, whilst 2, 3, and varied between ·884 and ·907 at 15° C. On fractionation, marked variance was noted, the soluble oils, 2, 3, d 4, yielding about 60 per cent. boiling below 180° C., ilst of 1 only 0·5 per cent. distilled below that temperare. The fractions boiling below 180° C. of 2, 3, and 4 were peatedly refractionated over metallic sodium, as described Wright (*Journ. Chem. Soc.*, vol. xxvi., p. 549), and sented a slight difference in the proportion of terpene iling at 163°–165° C., but with this exception no other ference was detected between them. The residues of the oils showed a considerable difference, that of 1 consing a considerable proportion of a hydrocarbon oil not arred by sulphuric acid, whilst the English sample, No. contained a small quantity of fixed oil, from which ristic acid was readily separated and identified by its lting point (54° C.). With the exception, therefore, of nple 1, the adulteration of which is unmistakable, the oils of English and foreign distillation accord fairly well. If, therefore, it should be deemed desirable in future editions of the B.P. to include oils of nutmeg other than those distilled in Britain, tests should be added such as those of the United States Pharmacopœia, viz., that the oil should be soluble in an equal volume of alcohol, sp. gr. ·920, whilst possibly a slightly wider margin of specific gravity, viz., from ·870 to ·910 instead of ·900 as there allowed, might be advantageously included. The following table shows a comparison of the four samples referred to, in which the difference between 1 and the other three samples can be readily noted:—

| | 1. Foreign. | 2. Foreign. | 3. Foreign. | 4. English. |
|---|---|---|---|---|
| Spec. grav. at 15° C... | ·955 | ·884 | ·886 | ·907 |
| Solubility in alcohol, spec. grav. ·820 ... | Not entirely soluble in any proportion. | Soluble in equal volume. | Soluble in equal volume. | Soluble in equal volume. |
| Fractionation— | | | | |
| Below 180° C. | 0·54 p.c. | 61·9 | 63·1 | 60·5 |
| 180-200° C. | 2·5 ,, | 18·4 | 19·1 | 10·8 |
| 200-260° C. | 58·1 ,, | 14·2 | 13·9 | 7·2 |
| 260-290° C. | 27·1 ,, | 1·3 | —— | 7·7 |
| Residue by difference... | 11·7 ,, | 4·1 | 3·9 | 13·8 |

I should like to add that I was first led to examine these nutmeg oils in order to answer a question that had been put to me:—"Is there any variation in the aroma and flavour of sal volatile (when diluted with water) arising out of a difference in the nutmeg oil used in its production?" With the data furnished above, there should be but little difficulty in answering the question.

*Southwark, London.* JOHN C. UMNEY.

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### THE PHARMACY ACTS AMENDMENT BILL.

Sir,—Having read the report of the proposed Bill, I quite agree with the members of the Council that they have taken a step in the right direction towards obtaining the support and confidence of the trade by giving "associates" the privileges which at present only members are entitled to. But I would like to make one suggestion (if not too late), namely, that all examined pharmaceutical chemists should have the title of "Fellow of the Pharmaceutical Society." As the Major examination is considered an honorary examination, why not have an honorary title also? The majority of the general public do not know the meaning of the title Pharmaceutical Chemist. But everyone knows the difference between an "associate" of a society and a "member," and again, between a "member" and a "fellow." I hope that the Council will consider it at their next meeting, as undoubtedly it would be an encouragement for the "Minor" man to go on with his studies.

*London.* YOUNG MEMBER.

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Sir,—I shall be glad if you will permit me to make a few remarks concerning the draft Pharmacy Acts Amendment Bill, which the Council has recently decided to introduce into Parliament. As there is no prospect at present of a more comprehensive and, therefore, more contentious measure receiving the sanction of the Legislature, obviously the most expedient course to adopt is to proceed with the present non-contentious Bill, the sole object of which is to strengthen and consolidate the Society. The fact that the Minor examination has greatly increased in severity, and is far different now rom what it was originally, is alone sufficient to warrant the recognition by the Society of the claims of those possessing that qualification to full membership. It is, however, in connection with the proposed transference of the title of Associate that I venture to offer a suggestion. Now that it is proposed to render successful candidates at the Preliminary examination eligible for the Associateship, the present appears to me to be an opportune moment to again direct attention to the desirability of both extending the scope and increasing the stringency of that examination, which remains practically the same as it was when it was first instituted. The advantages that would accrue from the widening of the range of the Preliminary have been so clearly indicated in your columns by Mr. J. E. Saul and others, that it is unnecessary to dilate upon them. I write simply to suggest that at the same time that the student is elevated to the rank of Associate, this much-needed change in the Preliminary should be effected.

*Lewisham.* E. L. Henry, M.P.S.

Sir,—Now that it is intended by the Pharmaceutical Society to raise "associates" to the status of "members," and "students" to that of "associates," would it not be a favourable opportunity of forming a higher grade, viz., that of "fellowship"? The new title "fellow" might be either exclusively reserved to men who have passed the Major, or extended to all pharmaceutical chemists, as thought desirable. The "fellows" need have no other privilege than the enjoyment of their title, and I think Major men deserve this recognition of their extra study. A Minor Man.

### On Dispensing Percentage Prescriptions.

Sir,—Mr. E. J. Green says the B.P. liquor acidi chromici would be dispensed by any chemist having a prescription for a 25 per cent. solution of chromic acid. I do not think so: generally, we weigh solids and measure liquids, and percentage solutions are regarded by the bulk of prescribers and dispensers as containing *n* parts in 100 fluid parts of the solution.

*Edinburgh.* J. A. Forret.

## Books, etc., received.

On Seborrhœa and its Consequences. By J. F. Payne, M.D., F.R.C.P. Pp. 23. 1s. London: John Bale and Sons. From the Publishers.

City and Guilds of London Institute for the Advancement of Technical Education. Report to the Governors, April, 1894. London: Gresham College. From the Secretary.

Liebig and Kopp's Jahresbericht über die Fortschritte der Chemie, for 1890. Part 1. Edited by F. Fittica. Pp. 480. Brunswick: F. Vieweg and Son. From the Publishers.

Wright's Prescription Book. Containing 150 prescription forms, perforated. 1s. Bristol: John Wright and Co. From the Publishers.

The Tannins. By Henry Trimble, Ph.M. Vol. ii. The Tannins of Oak Bark, Mangrove, Canaigre, Chestnut. Pp. 172. Philadelphia: J. B. Lippincott Company. From the Author.

Catalogue Générale de la Société des Echanges Botaniques Silésienne. Pp. 80. Mainburg, Bavaria: S. Mayer, Apotheker. From the Publisher.

Law and Theory in Chemistry. By Douglas Carnegie, M.A. Pp. i.-xiii., 1 to 222. 6s. London: Longmans and Co. From the Publishers.

The Natural History of Plants. From the German of Anton Kerner von Marilaun. By F. W. Oliver, M.A., D.Sc. Part 1. Pp. 112, with 2 coloured plates and numerous woodcuts. 2*s*. 6*d*. net. London: Blackie and Son. From the Publishers.

## Diary of the Week.

### Monday, May 7.

*Royal Institution of Great Britain*, at 5 p.m.
General Monthly Meeting.

*Society of Chemical Industry*, at 8 p.m.
"The Commercial Electrolysis of Fused Salts," by Claude Vautin.
"Testing of Hydraulic Cements," by W. H. Stanger and Bertram Blount.

### Tuesday, May 8.

*Royal Institution of Great Britain*, at 3 p.m.
"Rubies" (second lecture), by Professor J. W. Judd.

*Photographic Society of Great Britain*, at 8 p.m.
"On the Permanence of the Undeveloped Image on Gelatine Bromide Plates," by C. H. Bothamley.
"On the Standard Amyl-Acetate Lamp and some other forms of Constant Light," by C. H. Bothamley.

### Wednesday, May 9.

*Pharmaceutical Society of Great Britain.*
Library, Museum, School and House Committee.

### Thursday, May 10.

*Royal Institution of Great Britain*, at 3 p.m.
"The Solid and Liquid States of Matter" (second lecture), by Professor Dewar.

*Royal Society*, at 4.30 p.m.
Ordinary Meeting.

*Edinburgh District Chemists' Trade Association*, at 9 p.m.
Annual Business Meeting.

### Friday, May 11.

*Royal Institution of Great Britain*, at 9 p.m.
"English Folk Song," by S. Baring-Gould.

### Saturday, May 12.

*Royal Institution of Great Britain*, at 3 p.m.
"Colour Vision" (second lecture), by Captain Abney.

*Pharmaceutical Cricket Club* v. *St. Mark's C. C.*, at Surbiton, at 3 p.m.

*School of Pharmacy Students' Association.*
Botanical Excursion to Surbiton. Leave Waterloo at 2.5 p.m.

## Notices to Contributors.

*⁂ Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.*

*All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names only commenced with capital letters.*

*When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines, must be supplied not later than a week before the proposed date of publication.*

*Communications should reach the Editorial Department before noon on Wednesday, if publication is desired in the next issue of the Journal; though this cannot always be guaranteed.*

Communications, Letters, etc., received from Messrs. Carter, Hill, Mitchell, Wolstenholme.

## ABRUS PRECATORIUS;

### A CHEMICAL EXAMINATION OF THE LEAVES AND ROOT.

BY DAVID HOOPER.

The seeds of *Abrus precatorius* are well known under the names of "jequirity" and "ratí," and have been pretty thoroughly examined with regard to their chemical composition and physiological properties. The root of this plant, on the authority of Ainslie and O'Shaughnessy, has been described as a good substitute for liquorice root, and has been called wild, or Indian liquorice. Other medical and botanical authorities having noticed the resemblance of this root to liquorice, notably Dr. J. Fleming, Drury, Dalzell and Gibson, Bouton (of Mauritius) and Waring, it was made official in the Pharmacopœia of India in 1868. More recent observers in the field of Indian materia medica, after considerable acquaintance with the authentic drug, have thrown discredit upon the statements of these authorities. Dr. Bidie says: "The abrus root has little or no saccharine taste, and would form a very indifferent substitute for liquorice." He also expresses a doubt as to the Indian liquorice sold in the bazaars being the root of *Abrus precatorius*. Dr. Dymock considered the root to bear very little resemblance to true liquorice, either in appearance or qualities. Dr. Moodeen Sheriff noticed the poverty of the root in saccharine matter, and said the leaves were the sweetest part of the plant. The roots have been used in some parts of India to procure abortion, and Sanskrit writers have accorded to them actively emetic properties. It will be remembered that Warden and Waddell in 1884 pointed out the existence of a toxic property in the root similar to the seeds. In view of such evidence, it is wrong to apply the name "liquorice" to the root of *Abrus precatorius*, and its introduction into the Pharmacopœia of India was a mistake.

Some roots and leaves of abrus were obtained for me by Mr. R. Hollingsworth, of Madras. The collection of the roots was a matter of some little difficulty, as the plants grew in a rocky situation, and large stones had to be removed to get at them. The root is very hard and woody, and much branched. The larger pieces are about half an inch in diameter, gradually tapering, and very brittle. The colour is reddish-brown. The cortical layer is very thin, and the woody portion yellowish-white. Only the root bark had a slight disagreeable taste, and no distinct sweetness was perceived in the crude drug.

The whole root bruised and immersed in water and the infusion concentrated left a light brown extract which gave evidence of a very small quantity of a substance resembling glycyrrhizin. As water failed to dissolve anything but a small amount of extractive, a powder was made of the root bark, and as much of the woody portion as would pass through a fine sieve, and the whole was macerated in ether. The strongly coloured tincture was evaporated to dryness and left a dark reddish-brown, brittle residue, which softened in the mouth without imparting any taste or odour. The resin acid dissolved in ethylic and amylic alcohols, chloroform, bisulphide of carbon and the strong alkalies. It dissolved in strong sulphuric acid with a fine green colour. Nitric acid formed with it a yellow solution, and an alcoholic solution was precipitated by an alcoholic solution of plumbic acetate. Rectified spirit extracted a red coloured residue consisting of an organic acid and an alkaloid, with some colouring matter. The alkaloid was not very abundant; it yielded a volatile product of a very penetrating odour when heated with caustic soda. The subsequent treatment of the drug with water removed a brownish extract which was distinctly sweet, and when estimated by precipitation with acid it was found to contain one and a half per cent. of crude glycyrrhizin. The resin acid was the chief constituent of the root, and constituted as much as 8 per cent.

The leaves of *Abrus precatorius* are abruptly pinnated, like many other leguminous plants, and have eight to twenty pairs of leaflets. The leaflets are linear oval, obtuse at both ends, glabrous, membranous, deciduous, ⅜ to ⅝ of an inch long, and ⅙ to ⅓ of an inch broad. The taste is sweet, like liquorice, but they have no odour whatever. The sweet principle of these leaves was observed by Berzelius so long ago as 1827, but no examination or estimation of this principle appears to have been made.

The powdered leaves were first treated with ether to remove chlorophyll and fat, they were then extracted with distilled water until nothing further was dissolved, and the solution was precipitated with acetate of lead. The organic acid was separated from the lead compound with hydrogen sulphide, and was found to have the characters of glycyrrhizin. This method of Vogel yielded 9 per cent. of purified glycyrrhizin, which was soluble in alcohol, and became gelatinous when the solution was concentrated. Another estimation was made according to Lade's process, which consists in evaporating an infusion, precipitating with an acid, and purifying the precipitated mass by solution in alcohol. This process afforded 10·21 per cent. of glycyrrhizin, having the peculiar sweetness, with slight acridity, so well known in liquorice root, and leaving only a faint trace of ash. The acid nature of this substance was well marked, and since the investigations of Roussin (1875) and Habermann (1879) have brought out this feature very prominently, the name glycyrrhizic acid would be preferable for this principle. Roussin discovered the sweet principle of liquorice to exist as an ammonia compound, and Sestini (1878) gave it as his opinion that the glycyrrhizin was combined with calcium, but in fresh abrus leaves no ammonia was evolved by heating a decoction with caustic soda; on the other hand, sufficient potassium and calcium were present in the leaves to combine with the organic acid, and some of the acid, I have reason to believe, was there in a free state.

The following is a proximate analysis of the leaves of abrus. The nitrogen was estimated with soda-lime, and was calculated into albuminoids, omitting to deduct the small amount required for Habermann's formula of glycyrrhizic acid, which, by the way, has not been confirmed:—

| | |
|---|---|
| Chlorophyll and fat | 4·78 |
| Glycyrrhizic acid | 10·21 |
| Albuminoids | 16·56 |
| Gum and colouring matter | 3·90 |
| Fibre | 46·65 |

| | |
|---|---|
| Mineral matter .................. .......... | 10·20 |
| Water ......................................... | 7·70 |
| | 100 00 |

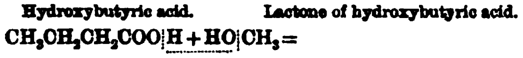
These leaves contain a large proportion of glycyrrhizic acid when compared with other drugs yielding this substance. Sestini* obtained 6·3 per cent. on dried liquorice root. McCullough† found 7·18 per cent. of crude glycyrrhizin in the root of *Glycyrrhiza glabra*, and 6·39 per cent. in that of *G. lepidota*, Nuttall. Dr. Moodeen Sheriff recommended an extract to be made from abrus leaves, but they are so bulky and light (fifty-eight leaflets weigh only one grain), and in the dry weather the foliage is so scanty, that it would be inconvenient to collect and manufacture, and the extract would have no advantage over solazzi juice. Genuine liquorice root is supplied at a low price by the bazaars in many parts of India, so that no substitute is needed for such an article of universal reputation.

## THE NOMENCLATURE AND FORMULÆ OF CARBON COMPOUNDS.

*(Continued from page 876.)*

### *Derivatives of the Hydrocarbons.*

Compounds are frequently met with which contain the characteristic group of more than one class of bodies, and therefore cannot be exclusively ranked with any one class. Thus bodies frequently contain the hydroxyl group, which necessitates their being regarded as alcohols, and the carboxyl group, which as plainly marks them as acids. Such are called hydroxy-acids; some of these hydroxy-acids have the curious property that the hydroxyl and carboxyl group combine with each other, water being eliminated as in the formation of an ester, and an "internal anhydride" is formed. By comparing this action in hydroxybutyric acid with the formation of an ester from butyric acid and an alcohol, the similarity of the reactions will be perceived—



$$CH_2\boxed{OH}\boxed{CH_2CH_2COO}\boxed{H} = H_2O + \underbrace{CH_2CH_2CH_2CO}_{O}$$

Hydroxybutyric acid. Lactone of hydroxybutyric acid.

$$CH_3CH_2CH_2COO\,\underline{|H + HO|}\,CH_3 =$$
$$H_2O + CH_3CH_2CH_2COOCH_3$$

Butyric acid. Methyl alcohol. Methyl butyrate.

Internal anhydrides of this nature are called lactones.

Passing now to organic compounds containing nitrogen, these may generally be regarded either as hydrocarbons in which some of the hydrogen has been replaced by nitrogen (often with hydrogen also attached to it), or as ammonia in which more or less of the hydrogen has been replaced by an organic radical. Considering them from the latter point of view, they fall at once into three groups, as follows: (1) those in which one atom or more of the hydrogen is replaced by an equal number of univalent radicals; these are termed amido-compounds; (2) those in which two hydrogen atoms are replaced by one bivalent radical; these are termed imido-compounds; (3) those in which three hydrogen atoms are replaced by one trivalent radical; these are called nitriles.

In the group of amido-compounds, when the ammonia residue or amido group ($NH_2$) replaces the OH of the carboxyl group of an acid, the resulting substance, which has neutral properties, is called an amide or acid amide. On the other hand, when the amido group replaces a hydrogen atom in a hydrocarbon the resulting compound shows basic properties and is called an amine. If a compound which would otherwise be an amine is more strongly characterised by some other group which is present than by the amido group, it retains the name it would have if the latter were absent, with the prefix amido-. A few examples will make these rules clearer:—

Acetamide, $CH_3CONH_2$, from acetic acid, $CH_3COOH$.

Di-acetamide,

$\begin{matrix}CH_3CO\\CH_3CO\end{matrix}\!>NH$.

Methylamine, $CH_3NH_2$. Dimethylamine, $(CH_3)_2NH$.

Triethylamine, $(C_2H_5)_3N$.

Ethylene diamine, $C_2H_4(NH_2)_2$.

Amido-acetic acid, $CH_2(NH_2)COOH$.

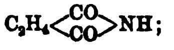
Amido-ethyl alcohol, $C_2H_4(NH_2)OH$.

In dibasic acids, if the OH of one carboxyl group is replaced by $NH_2$, and the other remains unchanged, the substance is termed an amic acid, as for example:—

$C_2H_4<\begin{matrix}CONH_2\\COOH\end{matrix}$ from $C_2H_4<\begin{matrix}COOH\\COOH.\end{matrix}$

Succinamic acid. Succinic acid.

Imido-compounds are similarly divided into imides, imines, and substances designated by the prefix imido-, as shown by the following examples:—



$C_2H_4<\begin{matrix}CO\\CO\end{matrix}>NH$; $C_2H_4{:}NH$; $CH({:}NH)COOH$.

Succinimide. Ethylene imine. Imido-acetic acid.

It should be noted that all amines and imines are designated with equal correctness by names having the prefix amido- or imido- respectively. Thus methylamine may be also called amidomethane, and so on.

When the three hydrogens of ammonia are replaced by a trivalent organic radical, the nitrogen will be attached by three bonds to a carbon atom; in other words, the compound will contain the cyanogen group (CN), and may therefore be also termed a cyanide. When an organic cyanide is boiled with caustic alkali, the elements of water are taken up, and an acid is formed, the nitrogen combining with hydrogen to form ammonia. For example, in the case of phenyl cyanide, $C_6H_5CN$, the reaction is shown thus:—

$$C_6H_5CN + 2H_2O = C_6H_5COOH + NH_3$$

Phenyl cyanide. Benzoic acid.

Any cyanide is called the nitrile of the acid which may be thus formed from it, and receives a corresponding name; thus phenyl cyanide is called benzonitrile, ethyl cyanide ($C_2H_5CN$) is also termed propionitrile, etc.

There are some substances which unite in themselves the typical structure of the two classes of bodies last considered, viz., ammonia derivatives and internal anhydrides. This condition arises from the loss of water by a substance containing a carboxyl and an amido group, and this may occur in two ways. For instance, amido-phenyl acetic acid might lose hydrogen and hydroxyl, thus:—

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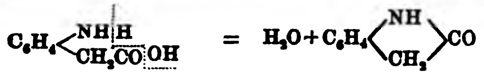
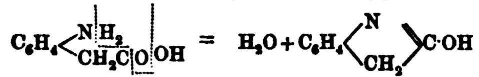
* *Pharm. Journ.*, [3], x. 387.
† *Am. Jour. Pharm.*, Sept., 1890.



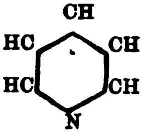
or it might lose two hydrogens and an oxygen, thus:—



giving two different products. Bodies formed according to the former type are called lactames, those according to the latter, lactimes.

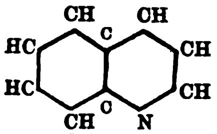
Continuing with compounds containing nitrogen, the next to be mentioned are the hydrazines. These are formed by substituting an alkyl residue for a hydrogen atom in hydrazine, $N_2H_4$, (or $H_2N-NH_2$), just as amines are formed by a similar substitution in ammonia; the class is chiefly of importance on account of the widely-useful member phenyl-hydrazine, $C_6H_5NH-NH_2$. Similarly when the OH group of an acid is replaced by the residue of a hydrazine, the compound is called a hydrazide (compare amide), as acetyl phenyl-hydrazide, $CH_3CO \cdot HN \cdot NH(C_6H_5)$. When two hydrogen atoms of a hydrazine unite with the oxygen of an aldehyde or a ketone, and the hydrazine residue takes its place, the resulting substance is a hydrazone, as acetone phenyl hydrazone, $(CH_3)_2C:N \cdot NH(C_6H_5)$.

Another class of nitrogenous bodies is seen in the "diazo-" and "azo-" compounds. When the residue of a "ring" hydrocarbon is united to an acid radical by means of two atoms of nitrogen, the compound is distinguished by the prefix diazo-, for instance, diazobenzene sulphate, $C_6H_5N:NHSO_4$; diazo benzene itself contains the hydroxyl group in place of the acid radical of its salts, and has the formula $C_6H_5 \cdot N:N \cdot OH$. If two hydrocarbon residues are similarly united by means of two nitrogen atoms, an azo-compound results, as azo-phenyl-ethyl, $C_6H_5 \cdot N:N \cdot C_2H_5$. The azo- and diazo- compounds are the bases of very many of the more important dyes.



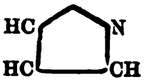
Pyridine.

There are three other nitrogenous bodies which require attention, viz., pyridine, quinoline, and pyrazol. The first of these is represented by the formula shown. Thus it may be regarded as benzene, in which one trivalent CH group is replaced by one atom of nitrogen; the latter is represented in the above formula as being united to the molecule by two bonds only; the third bond being usually unexpressed in the formula for the reasons before given for not showing the fourth bonds of the carbon atoms in benzene. Quinoline stands in the same relation to naphthalene that pyridine does to benzene, this fact being accordingly represented in the formula.



Quinoline.

Pyrazol $C_3H_4N_2$ is of growing importance as the basis of many new antipyretic substances; its molecule is represented graphically so as to show it to be a "ring compound," with two nitrogen atoms in the ring.



Pyrazol.

(*To be continued.*)

## THE "INDEX KEWENSIS."

The appearance of the first part of this great work calls for something more than a mere record. Since the publication of the second edition of Steudel's "Nomenclator Botanicus," in 1840-1, there has been no other attempt to collect and publish the names of the thousands of plants described in the botanical literature of all nations. But Steudel's work is merely an alphabetical catalogue of plant names, with the native countries of the plants and some other details. The "Index Kewensis" is what its title implies, as it gives references to the place of publication of each genus and of each species. The foundation of this work, on which Mr. B. Daydon Jackson and several assistants have been engaged ever since January, 1882, may be claimed for the late Sir William Hooker, who had an interleaved copy of Steudel's "Nomenclator Botanicus," in which he entered, or caused to be entered, all new names as they were published. This was commenced the same year that Kew Gardens were opened to the public, and it has been continued down to the present day, though there are doubtless some arrears in species. The practice is to post up, at least, all names of plants that are laid into the herbarium, and all names of new genera published in all the new books acquired for the library. Some years ago Sir William Hooker's interleaved "Steudel" was so full of manuscript that it was necessary to take some fresh step. Accordingly two copies of Steudel were procured and mounted on large folio paper, one column on each page, leaving two blank columns for the manuscript additions. The whole forms four huge folio volumes, and was prepared and continued chiefly at the expense of the late Mr. G. Bentham. In this way Mr. Daydon Jackson had something approaching a complete list of names of plants to start with, and he has during the last eleven years laboured continuously at the superstructure, the first part of which was in the hands of botanists early in September. For the history of the publication of the "Index Kewensis" we cannot do better than quote Sir Joseph Hooker's brief preface to the work:—

"Shortly before his death, Mr. Darwin informed me of his intention to devote a considerable sum in aid or furtherance of some work of utility to biological science; and to provide for its completion, should this not be accomplished during his lifetime. He further informed me that the difficulties he had experienced in accurately designating the many plants which he had studied, and ascertaining their native countries, had suggested to him the compilation of an Index to the Names and Authorities of all known Flowering Plants and their Countries, as a work of supreme importance to students of Systematic and Geographical Botany, and to horticulturalists, and as a fitting object of the fulfilment of his intentions.

"I have only to add that, at his request, I undertook to direct and supervise such a work; and that it is being carried out at the herbarium of the Royal Gardens, Kew, with the aid of the staff of that establishment."

Sir Joseph Hooker himself has most generously devoted an immense amount of time to the herculean and monotonous task of revision, and has brought his vast personal knowledge to bear on the independent but by no means inconsiderable task of settling the geographical distribution. Mr. Daydon Jackson estimates that the complete work will contain about 400,000 names and many more references; and the first part contains nearly 110,000 names. The period covered is from the establishment of binominal nomenclature by Linnæus down to the end of 1885. If nothing occurs to hinder the present rate of progress the whole work will be issued by the middle of 1895. —*Kew Bulletin.*

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## CRESOL SOLUTIONS AS ANTISEPTICS, ETC.

In an article on this subject in the *Apotheker Zeitung*, Dr. H. Nördlinger mentions that while ten years ago that portion of tar distillates which came over after phenol was regarded as an almost useless waste product, bacteriologists have now ascertained that the cresols it contains have a high value as antiseptics, and consequently the preparation of these materials for such purposes has become a special industry. The difficulty arising from the sparing solubility of cresols in water has now been overcome, and various cresol preparations readily miscible with water have been introduced for general use. These may be divided into two classes, according to the methods adopted in preparing them.

1. By mixing cresols with sulphuric acid and formation of cresol sulphonic acids.

2. By mixing cresols with concentrated solutions of soap or alkaline phenolates.

To the first class belong creolin Artmann and sanatol, to the second (*a*) the mixtures of cresol with resin soap, Creolin Pearson, Disinfectol, Izal, Sapo Rasbol II.; (*b*) mixtures of cresol with fat soap, Cresol (Raschig), Lysol, etc., also the liquor cresol saponatus and aqua cresolica of the German Arzneibuch; (*c*) mixtures of cresols with alkaline phenolates, such as solutol; and (*d*) mixtures of cresols with alkaline salts as solveol, etc.

All these preparations possess characters which interfere with their application for medicinal purposes.

1. When diluted with ordinary water they give turbid solutions, owing to the formation of insoluble lime salts.

2. They are decomposed by acid liquids or by fresh urine, unless they contain a large excess of uncombined alkali.

3. They are decomposed on dilution with distilled water with elimination of caustic alkali, which renders the solution corrosive.

To obviate these defects Gruber proposed the introduction of solutions of the purified cresols for medicinal use. Though less soluble in water than phenol or boracic acid, the phenols are more soluble than the benzoic or salicylic acids, which are used for the same purposes. One hundred parts of water at 15° C. will dissolve the following proportions:—

| | | |
|---|---|---|
| Phenol | 6 | |
| Boracic acid | 4 | |
| Benzoic acid | 0·3 | |
| Salicylic acid | 0·2 | |
| Orthocresol | 2·6 | Gru |
| Metacresol | 0·6 | |
| Paracresol | 1·9 | |
| Mixture of cresols from coal-tar | 2·75 | |

But so far back as 1891 Nördlinger had applied solubility of cresols in water for disinfecting purp by introducing saprol, and at his suggestion Gr investigated the use of water solutions of cresols f a bacteriological point of view, and he, as wel Scheurlen, recommended the application of such s tions for medicinal and disinfecting purposes.

At that time it was supposed that the cresols of c tar could not be separated at such a cost as wo allow of their being used in an isolated conditi and shortly after the publication of Gruber's p a preparation was introduced under the name "tricresol," consisting of the three forms of this s stance existing in coal tar. It is represented as be a natural mixture of those substances, and to be constant composition, although it is well known t the relative amounts of ortho, meta, and paracre vary according to the kind of tar from which t mixed product is obtained. But the fact that t cresol yields distillates between 183° and 185°, a 185° and 190°, amounting to 4·3 per cent. and 5 per cent., while the cresols only begin to boil a 188°–190°, shows that tricresol also contains an appreciable amount of phenol, from 4 to 9 per cent. Nördlinger has introduced a purer form of unmixed cresol free from phenol under the name pure liquid cresol. He describes it as the hydrate of orthocresol, $C_6H_4CH_3.OH + H_2O$, bearing the same relation to the crystalline orthocresol that liquefied phenol has to the crystalline substance.

The reasons for giving a preference to orthocresol as compared with meta or paracresol are the following:—

The slight differences in the disinfecting power of 4 per cent. solutions of the different cresol sulphonic acid observed by Frankel are scarcely recognisable with water solutions containing 0·5 to 2 per cent. of the several cresols. The relative disinfecting power was not therefore of so much importance in regard to the selection of one or other of the three cresols as their chemical, physical, and economic relations. Orthocresol has important advantages over the other two forms of this substance. It is more soluble in water, less corrosive, and less poisonous. Moreover, it can be produced with ease in large quantities, and supplied at a much lower price than the other forms of cresols. As it is solid below 30° C., it is supplied for use in the hydrated liquid state as a colourless clear liquid, which gradually becomes reddish on exposure to light. The specific gravity is 1·06. It does not solidify above 10° C., has an agreeable odour, is soluble in alcohol or ether in all proportions, forms a clear solution with 33 parts of water, and is readily soluble in alkalies.

Orthocresol gives a reaction with ammonia, which serves to distinguish it from the other forms of cresols. When a few drops are mixed with a few centimetres of ammonia solution and shaken, the liquid becomes bluish on standing, like dilute solution of cupr lphate ; 'but after some days it acquires a deep digo blue colour, and becomes opaque. Paracresol reated in the same manner gives a transparent iquid of a pale yellow colour. Metacresol also gives transparent liquid, which has at first a faint steel lue colour, afterwards becoming bluish, but distinuishable from the deep indigo blue produced with rthocresol.

In the state supplied for use the purified cresol is eutral, free from any admixture for rendering it mis-ible with water, and consequently the solution made y mixing it with ordinary water is quite clear. This olution is not decomposed or rendered turbid by cids or earthy salts. A one per cent. solution does ot affect the skin, does not render the hands slippery r numb, and metal instruments are not acted upon y it. Solutions containing 0·25 to 1 per cent. are as ffectual as solutions containing from 2 to 5 per cent. f carbolic acid.

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## CINNAMON AND CASSIA BARKS.

A contribution to our knowledge of the barks of the genus *Cinnamomum*, more especially those affording the cassia barks of commerce, has recently been published by Dr. Rudolph Pfister in the *Forschung-Berichte über Lebensmittel und ihre Beziehungen zur Hygiene, über forense Chemie und Pharmacognosie* (vol. 1, pp. 6 and 25). Several of the specimens examined by Dr. Pfister were supplied from the Museum of the Pharmaceutical Society of Great Britain, and the information he has contributed is to a great extent new and of much histological value.

The species studied were *Cinnamomum zeylanicum*, Nees., *C. cassia*, Bl., *C. iners*, Reinw., *C. obtusifolium*, Nees., *C. burmanni*, Bl., *C. tamala*, Nees. et Eberm., *C. loureiri*, Nees., *C. culilawan*, Bl., *C. sintok*, Bl., *C. sp. incerta* ("Massoi bark from New Guinea") and *Massoia aromatica*, Becc.

In the examination of these barks, authentic specimens of the stem or bark of the species were obtained and compared with the barks in commerce. As the result of his work he has constructed the following analytical table of the commercial barks obtained from the genus and sold under the name of cinnamon or cassia :—

I. RAPHIDES ACICULAR, principally in the medullary rays.

A. *Bast fibres numerous.*

(*a*) Cells of the sclerenchymatous ring tangentially elongated.

1. Cells of the secondary parenchyma isodiametric. *C. zeylanicum.*

2. Cells of the secondary parenchyma tangentically elongated. *C. obtusifolium.*

(*b*) Cells of the sclerenchymatous ring radially elongated. *C. iners.*

B. *Bast fibres few.*

Secretion cells 60–100 $\mu$ in diameter ; cells of the secondary parenchyma thin-walled ; no porous cells. *C. cassia.*

II. RAPHIDES TABULAR.

A. Cells of the medullary rays with porous thickening. *C. loureiri.*

B. Cells of the medullary rays usually thin-walled.

(*a*) Secondary parenchyma thin-walled ; no porous cells ; sclerenchymatous cells in isolated groups. *C. burmanni.*

(*b*) Secondary parenchyma with a tendency to sclerosis ; porous cells present. *C. tamala.*

A similar analysis of the other barks is not given, but the characters recorded under each may be thus tabulated :—

*C. sintok.*—Raphides acicular; fibres of the secondary bast *band-shaped* ; sclerenchymatous ring *continuous*; *porous cells present.* Stone cells forming *well-defined zones* in the secondary bast.

*C. culilawan.*—Raphides acicular and bone-shaped ; bast fibres *band-shaped*, lignified ; sclerenchymatous ring interrupted; *porous cel's absent ;* stone cells forming *numerous groups* in the secondary bast.

*C. species* (false Massoi bark).—Raphides acicular ; sclerenchymatous ring interrupted, *unequal in width* ; *porous cells present* ; stone cells in rounded *groups only in the outer part* of the inner bark.

*Massoia aromatica.*—Raphides singly or in pairs, filling the *stone cells* of each group ; bast fibres *circular in section, always with oblique slit-like pores* ; stone cells isodiametric in groups.

The author does not, however, direct special attention to the differences evident to the unaided senses. It may be pointed out, therefore, concerning the less known barks, that *C. obtusifolium* has a very fibrous inner bark evident on transverse fracture, and a coriander flavour ; that *C. tamala* and *C. burmanni* are very hard, horny barks, somewhat mucilaginous when chewed, the latter having a slight flavour of cassia. *C. iners* is a softer, somewhat fibrous bark, but the fibres are not very perceptible to the naked eye; and the aromatic odour is stronger than the taste, which is sweet and slightly pungent. *C. culilawan*, as its name implies, has a clove-like flavour, in which it is like false Massoi bark. True Massoi bark (*Massoia aromatica*) differs from all the others in the flavour and odour resembling that of cocoa nut oil.

Concerning the geographical sources of the cinnamon and cassia barks, Dr. Pfister considers that cinnamon bark, although cultivated in many tropical countries, is nowhere equal to that of Ceylon. The cassia bark of Sumatra, known as the "Cassia vera Padang," comes exclusively from *C. burmanni*. This species yields cassia also in other islands of the Dutch East Indies, as in Java, etc., also in Timor, and probably also some of the Chinese cassia. It is likewise the source of the red-brown kind of Vogl.

*C. tamala* affords cassia bark in North India, and therefore probably a good deal of that which comes from Calcutta. Dr. Pfister has also seen bark of this species from Cochin China and China.

*C. iners* yields a bark constituting probably a part of the cassia from the E. I. Archipelago. Dr. Pfister has also seen it from Bombay.

*C. obtusifolium.*—This yields bark in Northern India. It has been offered in the London market as cinnamon.

The histological examination of these barks has shown that the bark of *C. burmanni* is identical in structure with that of *C. dulce*, Nees., *C. kiamis*, Nees., and *C. burmanni* var. *lanceolata*; that *C. tamala*' Nees. and Eberm., and *C. albiflorum*, Nees., are the same species; that the bark sent by Dr. Dymock to this Society as that of *C. tamala* belongs to *C. iners*; that the cassia bark from Calcutta ('Mus. Cat.,' No. 452, e) is derived from *C. tamala*; that the Saigon cassia of the New York market is the unscraped bark of *C. cassia*; and that the true Massoi bark and the false Massoi bark from New Guinea are quite as distinct under the microscope as they are in odour. He also brings out the curious fact that the "*Cassia vera*" of the Continent is that of *C. cassia*, whilst in this country it is that of *C. burmanni* and *Tamala*, and that the "*Cassia lignea*" of continental writers is the bark of *C. burmanni* and *C. tamala*, whilst in London it is that of *C. cassia*; that the China cinnamon of continental (and American) authors is the bark of *C. cassia*, and that the China cinnamon of London is the unscraped bark of *C. cassia*, known in New York as "Saigon" cinnamon. This unscraped bark is much more aromatic and pungent than the scraped bark.

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## STERILISATION BY FILTERS.

Filtration through porous filtering media has been considered an excellent method of removing from water any microbes it may contain, but nothing is less certain. As early as 1885 Bourquelot and Galippe had protested against the supposed infallibility of these filters, finding as the result of their experiments that microbes could pass through the porous porcelain. Their conclusions have been confirmed by the experiments of Lacour-Eymard (*Revue d'hygiene*, June, 1893). The results of introducing cultures of *Bacterium termo*, *B. coli commune*, and *Micrococcus prodigiosus*, into clean and sterilised Chamberland filters, are represented in the following table, the number of colonies per cubic centimetre of the filtered water, found at the end of the eighth to the fifteenth day respectively, being there given in columns :—

| Name of Organism. | 8th to 10th day. | 11th day. | 12th day. | 13th day. | 14th day. | 15th day. |
|---|---|---|---|---|---|---|
| *B. termo* .................. | 2 to 5 | 24 | 116 | — | — | 480 |
| *B. coli commune* ...... | Few | — | 8 | 20 | 24 | 60 |
| *M. prodigiosus*......... | — | — | 48 | 169 | 234 | 380 |

These filters appear, therefore, to be far from affording absolute security; and the porous cylinders should be carefully cleaned and sterilised every three days at least, and a pressure of not more than two atmospheres be maintained, to ensure even relative security. —*Médicine moderne*, through *Bull. de pharm. de Bruxelles.*

## VIIIth INTERNATIONAL CONGRESS OF HYGIE AND DEMOGRAPHY.

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### PHARMACY SECTION.

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### PROVISIONAL PROGRAMME.

President :—Dr. J. Jármay.

Honorary Presidents :—Dr. Arp. Bókai, Dr. Chrl. Ki Dr. Alb. Lengyel, Chl. Thán, Dr. L. Tóth, J. Török.

Secretaries :—Dr. S. Fischer, Dr. J. Kóssa, Dr. St Moldoványi, A. Török.

The foreign honorary presidents will be elected b the executive committee as soon as it is known wh intend to take part in the Congress.

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The following is the list of papers already promised in this section :—

1. "On the establishment and control of pharmacies in different countries," by Herr Böttger (Berlin).
2. "New remedie s," by A. Brestowsky (Vienna).
3. "Practical notes on the storage and preservation of medicaments," by Eugen Dietrich (Helfenberg).
4. "The training of pharmacists," by Albert Hilger (Erlangen).
5. "New forms of apparatus for use in the examination of drugs," by Károly Kiss (Budapest).
6. "On the dispensing of medicines by medical men, and the evils of secret remedies," by J. König (Hermannstadt).
7. "The quantitative analytical methods of the different pharmacopœias compared," by A. Kwizda (Vienna).
8. "New drugs which ought to be official in the pharmacopœias," by H. Bocquillon-Limousin (Paris).
9. "Incompatible medicines," by István Moldeványi (Budapest).
10. "Determination of the active principles in the more important tinctures and extracts," by István Moldoványi (Budapest).
11. "A comparison of the various official methods of quantitative analysis," by Nándor Molnár (Budapest).
12. "On agreement in the writing of prescriptions," by Camille Redard (Geneva).
13. "On the storage and preservation of drugs," by Mátyás Rozsnyai (Arad).
14. "The medicinal plants of Hungary," by Aurél Scherfel (Felka).
15. "The evils resulting from the sale of secret remedies," by Igo Schwarcz (Esseg).
16. "An International Pharmacopœia," by Anton von Waldheim (Vienna).
17. "The chemistry of the Hungarian Pharmacopœia," by Lajos Winkler (Budapest).

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, MAY 12, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE COUNCIL REPORT.

IN connection with the subject of trade organisation, the report to be presented by the Council at the anniversary meeting of the Society contains matter which is of more than ordinary interest, both in regard to the work of the Society as a voluntary organisation and in regard to its proceedings in that more public capacity in which it has been placed by statutory enactments. In the first place it is to be noted that the Society is constituted of rather less than one-third of the number of those who have been, from the point of view of the State, incorporated as legally qualified to carry on the business in which they are engaged. It is only that section of the entire body that takes part in the work of protecting and advancing the interests of the craft, and this fact is very generally overlooked by those who criticise what is done with those objects, or complain of what is not done. Potentially the Society is the entire trade; for at the present time it is open to every member of the trade to associate himself with the Society in some capacity, and to influence, as well as assist, in the internal administration of pharmaceutical affairs. Of the two-thirds of the entire trade who have not done so there are no less than four thousand individuals possessing the advantage of the partial federation conferred upon them by the Act of 1868, in virtue of their having been previously in the business, who are still unconnected with the Society, although eligible as members on application. Among those who have since that time been enrolled as legally qualified members of the craft there is a still larger number that have not joined the Society. Hence, owing to the small area occupied by the Society, as compared with the entire body of qualified chemists, the action of the Society for purposes of protection and advancement is necessarily restricted and impeded. That disability in regard to the promotion of the general interests of the body must necessarily continue to exist until the internal organisation is more extended, and brought into closer approximation to identity with the incorporation of registered chemists, which has been established for public purposes.

But even with the limited capabilities of the Society as it is now constituted, the official retrospect of the past year shows that a vast amount of work has been done to the advantage of the entire body of chemists. Taking in the first place the work done by the Society in its more private capacity as a voluntary organisation, the maintenance of the School of Pharmacy may be referred to as having been pre-eminently conducive to the interests of the body at large. It has been the means of gaining for chemists higher appreciation and respect, which directly benefit each and all of them. In connection with this part of the Society's work mention must also be made of its museums and libraries, and the means by which their utilisation for educational purposes has been provided for. Though the advantages of these departments have been chiefly confined to those who reside in London and Edinburgh, the success which has attended the establishment of a branch of the Society in Scotland points to the possibility that, with a more extended membership, similar branches might be established elsewhere, and be productive of equally beneficial results. The evening meetings held at the two centres above mentioned during the past year have afforded opportunity for gaining information and discussing matters of interest in a manner that has been of practical value to those engaged in the business of pharmacy. The effect of this and similar work is to be seen in the decision of the General Medical Council to invite the aid of the Society in the compilation of a new edition of the British Pharmacopœia. Another important undertaking of the Society is the establishment of a research laboratory, which has attracted the attention and support of public bodies outside the Society. The Benevolent Fund and the Orphan Fund are further illustrations of the good service rendered to the trade at large by the comparatively small section constituting the Society.

In its capacity as a public body, entrusted with statutory functions, the Society has continued to perform the duty of testing the fitness of candidates to be placed on the Register of qualified chemists, and while the Government Visitor of the examinations has testified to the public advantage arising from that work, the record of rejected candidates shows that it has also been productive of benefit to registered chemists by protecting them from the competition of incompetent persons. As a further lesson to be learnt from the results of the examinations, it may be inferred that there is still a great deficiency in the provison for systematic training for the business, by which the community would be secured the services of chemists possessing scientific and practical knowledge. In the administration of the Pharmacy Act the work of the Society during the past year has been extensive and its results highly important, both in regard to the public and for the interests of chemists. There has been greater activity in reporting cases of infringement of the Pharmacy Act, and in a very large number of those cases proceedings have been taken to enforce compliance with the law. As a consequence of the decision of the Court of Queen's Bench in regard to proprietary medicines containing poison, it has been necessary to institute proceedings against unregistered persons dealing in these articles. In most of these cases decisions have been given in favour of the Society, and in one case which was made the subject of an appeal, the decision was confirmed by the Divisional Court. The action of the Society in this respect has, however, been strenuously contested by the unregistered vendors of proprietary medicines, and the question as to the precise point at which a preparation, containing a scheduled poison, becomes subject to the provisions of the Pharmacy Act has still to be decided. The attempt to bring such preparations within the exemption of the sixteenth section of the Act, by taking out patents for them, has necessitated applications to the Court of Chancery for the revocation of such patents as being contrary to the law. In three instances patents of this kind have been revoked, and other cases are awaiting trial. In Scotland the Society has instituted prosecutions against several unregistered assistants in the open chemists' shops kept by medical men, and the defendants have either pleaded guilty or been convicted. In one case the decision has been appealed against in the High Court of Justiciary in Edinburgh, and the decision of the judges in reference to it has not yet been delivered.

In respect to all the matters above referred to, the work of the Society has been for the good of the craft generally, and productive of benefit to every individual engaged in the business. The credit attaching to the work done belongs to those constituting the Society, and if the achievement falls short of what might have been done, it must also be evident that any just complaint on that score by chemists who are not connected with the Society can only be regarded in the light of self-condemnation.

### MEDICAL TREATMENT BY CHEMISTS.

REFERRING to the case reported in the Journal last week (p. 933), in which a man died after the administration of a hypodermic injection of morphine by a chemist, the *British Medical Journal* remarks that it serves to illustrate, not only the danger attending such amateur medical practice, but also the very undesirable position in which it may place chemists who lend themselves to this practice. In connection with the case, it is stated that a local medical man writes to say that there are a number of chemists in the neighbourhood who do a regular trade in prescribing, and that some of them treat almost as many patients as the ordinary doctors. It is matter for reget if, as alleged, there is every reason for believing that such a practice is very general, and we are quite in accord with the opinion expressed by our contemporary, that there can be no doubt that the practice is in many instances detrimental to the persons so treated, as well as to the legitimate interests of medical men and chemists. The precise line of demarcation between what is unlawful and permissible in this respect is undoubtedly very difficult to define, but, as suggested, "there should not be any difficulty on that point if due consideration is given to the relations which ought to exist between chemists and medical practitioners."

### THE ANNUAL MEETING.

THE fifty-third annual general meeting of the members and associates in business of the Pharmaceutical Society will be held at 17, Bloomsbury Square, on Wednesday, May 23. The report of the Council will then be received, and the election of members of Council and auditors for the ensuing year take place. Notice of the following motion, to be proposed at the meeting, has been given by Mr. R. A. ROBINSON, an associate in business of the Society:—

> "That this meeting cordially approves the draft Pharmacy Act Amendment Bill recently adopted by the Council, with the exception of the words in clause 3, limiting the number of representatives on the Council, of members who are not on the register of pharmaceutical chemists, being strongly of opinion that any limitation of equality of representation would injuriously affect that unity it is so desirable to promote. This meeting is therefore of opinion that no such limitation should be placed upon any qualified member of the Society being elected to the Council."

### THE SALE OF CARBOLIC ACID.

THE *Medical Press* remarks that it is to be hoped the Pharmaceutical Society will not rest content with the unsatisfactory reply given by Mr. ACLAND when asked to include carbolic acid among the scheduled poisons. It is further observed that he evidently regarded the request as an attempt by chemists to obtain the monopoly of the sale of this much-used disinfectant; but that it was surely unnecessary to invoke any such unworthy motives in view of the terrible and increasing number of deaths from accident and suicide attributable to the indiscriminate sale of so poisonous a drug. The extraordinary rapidity with which carbolic acid has climbed to the second place in the list of poisons employed by suicides and in occasioning deaths by accident is urged as sufficient evidence to prove the immediate necessity for restricting the sale. At the same time it is remarked that it would possibly be too sanguine to hope that we are within measurable distance of a recasting of the laws regulating the sale of poisons generally, in spite of the numerous and gross abuses to which it is, from time to time, necessary to call attention.

### THE ANNUAL DINNER.

We are desired to remind those members and associates of the Society who contemplate being present at the Annual Dinner on Tuesday, the 22nd instant, that Saturday next, the 19th instant, has been fixed as the latest day for receiving applications for dinner tickets. After that date it may be difficult to secure a seat. The Honorary Secretary to the Dinner Committee is Mr. Richard Bremridge, 17, Bloomsbury Square, who is the only person through whom tickets may be procured.

### SCIENCE PROGRESS.

The introductory article in the May number of this review is by Mr. R. Warington, F.R.S., and treats of the determination of the available plant food in soils. The main object of the chemical analysis of soils is first considered, and the results of a series of analyses made at Rothamsted next receive attention, after which a summary of the results obtained by Dyer in determining the acidity of root sap is given, and reference made to the work of Grandeau and Pitsch. The embryology of the Porifera is the subject of a lengthy paper by E. A. Minchin; some aspects of the immunity question are discussed by Dr. G. A. Buckmaster; and the value of experimental work in mineralogy is enforced by H. A. Miers. In a paper on "Algæ," Mr. G. Murray, of the British Museum, speaks of various publications devoted to descriptions of plants in this group, and refers approvingly to Mr. Holmes' *fasciculi*. Finally, Dr. C. S. Sherrington gives some interesting jottings from recent neurological progress. The editor of "Science Progress" may be congratulated on maintaining a uniform standard of excellence in the publication, and on fairly recording progress in different directions.

### BRITISH MEDICAL ASSOCIATION.

The sixty-second annual meeting of the British Medical Association will be held at Bristol from July 31 to August 3, inclusive, under the presidency of Professor George Hare Philipson, M.D. Cantab., D.C.S., F.R.C.P., who occupies the chair of Medicine in the University of Durham. Various meetings will be held each day; the president's address will be delivered on the Tuesday evening; the public dinner is to be held on the Thursday evening; and Saturday, August 4, will be devoted to excursions. In the annual museum, section A will be devoted to food and drugs, including prepared foods, chemical and pharmaceutical preparations, etc.; section B to instruments; section C to books, diagrams, and charts; and section D to sanitary and ambulance appliances. The secretary to the museum sub-committee is Mr. John Dacre, 14, Eaton Crescent, Clifton.

### INTERNATIONAL CONGRESS OF HYGIENE.

We have been favoured by Dr. Julius Jarmay, President of the section on pharmacy in connection with this Congress (see page 877), with a list of the papers so far promised. This will be found at page 942. It will be noticed that no communications have yet been promised by British pharmacists, and we are desired by Dr. Jarmay to state that the committee will esteem it an honour if any representatives of pharmacy in this country decide to take part in the proceedings of the Congress.

### PHARMACEUTICAL SCHOLARSHIPS.

The attention of pharmacy students is once more directed to the advantages offered to those who successfully compete for the "Jacob Bell Memorial" and "Manchester Pharmaceutical Association" scholarships, full particulars of which will be found in the Society's calendar. The examinations on the results of which these will be awarded will this year be held on July 10, and all entries must be in the hands of the Secretary—Mr. Richard Bremridge—by June 1. All candidates must be subscribing "Students" of the Pharmaceutical Society, and to prevent disappointment, it is desirable that intending competitors should understand that they cannot be elected as such, to be in time for the examinations, later than the meeting of the Council held on the first Wednesday in May. In the case of the Jacob Bell Scholarships, two of which are offered annually, candidates must be between twenty and twenty-two years of age on the date of examination, and have spent not less than three years in the pharmacy of a registered pharmaceutical chemist or chemist and druggist. The conditions are practically the same for the Manchester scholarship, except that the age limit differs, being from nineteen to twenty-one years, and the three years' pupilage must have been spent in a pharmacy situated in Lancashire, Cheshire, or the High Peak parliamentary division of Derbyshire. It is greatly to be regretted that this scholarship has never yet been competed for since its foundation, an inexcusable lack of ambition being thus evidenced by students in the district mainly interested, and it is to be hoped that there may be no ground for a similar reproach in future.

### EXPORTATION OF INDIAN OPIUM.

In the House of Commons on Tuesday it was officially stated that the number of chests of opium exported from India to China were:—In 1892—October, 5619; November, 6332; December, 4410. 1893—January, 3442; February, 3815; March, 4448; October, 6591; November, 6647; December, 5027. 1894—January, 5521; February, 3795; and March, 2498. It will be seen that the amount exported during the last-named month is little more than half that for the same month of last year, though the total for the first quarter of the year exceeds that for the corresponding period in 1893.

### PHARMACEUTICAL SOCIETY *v.* ARMSON.

We understand that in connection with this case notice of appeal has been lodged against the decision of Justices Charles and Bruce, delivered in the Queen's Bench Divisional Court on April 26 last (see page 902).

# Transactions of the Pharmaceutical Society of Great Britain.

## DONATIONS.

*To the Library in London.*

**Mr. William West, Bradford:**
New British Freshwater Algæ, 1893.

**Mr. J. Medley Wood, Durban, Natal:**
Report on Natal Botanic Gardens for 1893.

**Pharmacy Board of New Zealand:**
Pharmaceutical Register of New Zealand for 1894.

**Dr. A. De Wèvre:**
Recherches sur la technique microchimique des albuminoïdes, 1894.

**Dr. Theodoro Peckolt, Rio de Janeiro:**
Historia das plantas medicinaes e uteis do Brazil, fasc. 3-4.

**Royal Institution of Great Britain:**
Proceedings, 1893.
List of Members, etc., 1893.

**Royal Medical and Chirurgical Society of London:**
Medico-chirurgical Transactions, vol. 76.
Catalogue of Library, supplement 7.

**Dr. R. A. Philippi, Santiago de Chile:**
Plantas nuevas chilenas, 1894.

**Professor H. Trimble, Philadelphia:**
The Tannins, vol. 2, 1894.

**H.M. Secretary of State for India:**
Flora of British India, by J. D. Hooker, part 20.

# Proceedings of Societies in London

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

At the meeting held on Thursday, April 19, Mr. T. Tickle, Vice-President, in the chair, the following paper was read by Mr. Goulding, the reporter on botany:—

### PROTOPLASM.

BY ERNEST GOULDING.

Protoplasm is the living substance of the vegetable cell. The word first occurs in a memoir by Mohl, in 1846, "On the Movement of Sap in the Interior of Cells,"* which deals, however, not so much with the movement of what would to-day be called cell-sap as with the general behaviour of all the motile contents of active vegetable cells. After showing that his predecessors had not clearly understood the important part played in the life of the cell by the viscous matter known vaguely up to that time as "schleim," or mucus, Mohl points out the essential identity of the nucleus, primordial utricle, and the basic substance filling all but the sap-cavities of the cell. For the substance which is essential to the formation of every new cell and to the development of newly formed cells, he proposed, upon physiological grounds, the significant name "protoplasma."

The protoplasm may constitute the whole cell, as in the Myxomycetes, in which case the naked masses are termed "plasmodia;" or it may be enclosed by a cell-wall, as in all the higher plants.

The consistence of protoplasm depends upon the amount of water it contains. Thus, in dry seeds it is nearly as tough as horn, while in the same seeds during germination it becomes like softened gelatin. It absorbs water readily and becomes permeated by it, thereby increasing its apparent fluidity, but it never becomes a true fluid.

In a young cell, the protoplasm occupies the whole of the cell-cavity; it gradually absorbs water, however, and on account of the pressure set up in the interior by which the cell-wall is stretched, the protoplasm is forced against the wall, and the water collects in a vacuole (or vacuoles) in the centre. The layer of protoplasm, which thus forms a lining to the cell-wall, was termed by Mohl the "primordial utricle."

Protoplasm possesses very considerable power of locomotion. Its movements may be classed under two heads:—

1. *Movements of Protoplasm destitute of a Cell-wall.*—Of these there are two kinds: (*a*) swimming by means of cilia, as in *Protococcus* and the antherozoids of many cryptogams; and (*b*) amœbiform movements, where a naked mass of protoplasm emits irregular projections, termed "pseudopodia," from its surface, while the rest of the mass flows after the processes.

2. *Movements of Protoplasm within the Cell-wall.*—When a single strong stream moves round the protoplasm lining the cell-wall (as in the root-hairs of *Hydrocharis*), the movement is called "rotation," to distinguish it from the other movement, termed "circulation;" in the latter case, the protoplasm travels to and from the nucleus, and thus currents may pass one another, going in opposite directions, whereas in the movement of rotation the current is always in the same direction.

The rate of protoplasmic movement is accelerated by increase of temperature up to a given point (the optimum); beyond this point the movement may continue until an upper limit of temperature (the maximum) is reached, above which no motion is observable. At or very near this point structural changes take place, and the death of the protoplasm speedily ensues.

The optimum temperature for protoplasmic movement differs for different plants, but is not far from 37°·5 C.

The maximum, beyond which no movement is seen, also varies, but may be given as not higher than 50° C.

The lower limit (the minimum) of temperature, below which no movement takes place, may be stated at 0° C., and until a temperature of at least 15° C. is attained, the movement is sluggish. No marked effect upon the rate of the protoplasmic movement appears to be caused by the presence or absence of light, except so far as the concomitant action of heat comes into play.

The effect of mechanical irritation is to stop the movement of protoplasm for a time. An interrupted current of electricity has essentially the same effect.

It was supposed, until recently, that the protoplasm in one young cell is completely shut off from that in contiguous cells by an imperforate cell-wall, and that even in the cases where the wall is perforate, there is no communication of protoplasm through the pores. There is now abundant evidence to show the incorrectness of the view. It has been shown lately that in many plants the protoplasm of one cell is in communication with that of the cells around it by means of plasmic threads, which pass through the cell-walls: this has been termed the "continuity of the protoplasm."

Chemically considered, protoplasm is a very complex substance. It is composed of the elements carbon, oxygen, hydrogen, nitrogen, and sulphur in somewhat varying proportions, and belongs to the group of bodies known as proteids.

The following are its principal reactions:—

1. Iodine stains it a yellow or brownish colour.
2. When treated with a solution of copper sulphate

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* *Botanische Zeitung*, 1846, p. 75.

and afterwards with potassium hydroxide, a purple colour is produced.

3. With Millon's reagent it gives a red colour.

4. By the successive action of a solution of sugar and strong sulphuric acid a rose-red colour is obtained.

5. When strong nitric acid and ammonic hydrate are successively applied, a yellow or orange colour is produced.

6. Dilute solutions of the caustic alkalies dissolve protoplasm, concentrated solutions do not.

The protoplasmic contents of a cell present certain clearly differentiated portions. In the first place, there is the "nucleus;" closely associated with the nucleus are two bodies termed the "centrospheres," and, finally, there are more or less numerous "plastids." These all lie in the general protoplasm of the cell, which is termed the "cytoplasm."

The cytoplasm apparently consists of a single proteid substance, termed "cytoplastin."

With regard to its structure, the cytoplasm has been said to consist of a sort of network of fibrillæ, in the meshes of which is a homogeneous liquid. The bars of the network are said to be the living substance or true protoplasm, while the substance in the meshes is not living, and is termed "paraplasm."

According to another theory, the cytoplasm is not a network, but is of the nature of a foam or froth.

Imbedded in the cytoplasm, especially in the inner portions, there are generally minute granules, which have a high degree of refringency, and which stain very deeply with hæmatoxylin; these are termed, by Hanstein, "microsomata." The cytoplasm consists of two portions, an outer, delicate, firmer layer, the "ectoplasm," which is identical with the primordial utricle afore-mentioned, and an inner, more watery portion, the "endoplasm."

The cytoplasm contains granules of foreign matter in varying quantities, such as other proteids, fats, carbohydrates, and a small proportion of inorganic matter.

Apart from these granules which it contains, the cytoplasm has been distinguished as "cyto-hyaloplasm," or clear cytoplasm; of this the ectoplasm entirely consists.

The cyto-hyaloplasm has been distinguished into the formative cyto-hyaloplasm or "kinoplasm," and the nutritive cyto-hyaloplasm.

The former is closely associated with the nucleus, and is active in the processes of cell formation, and upon its presence in the cell depends the capacity of the cell for growth and multiplication. The latter, as its name implies, plays an active part in the nutrition of the plant.

The nucleus was so named by Robert Brown, who first called attention to its importance. It is always situated in the cytoplasm, and, in actively growing cells at least, in the kinoplasm. It consists mainly of a semi-fluid clear ground-substance, the "nucleo-hyaloplasm," which chemically is a substance termed "paralinin." In the hyaloplasm lies a fibrillar network which consists of a substance termed "linin," in which are imbedded numerous granules of a substance termed, by Flemming, "chromatin," and, by Strasburger, "nuclein." In the hyaloplasm are also one or more granules, the "nucleoli," which consist of a substance termed "pyrenin." When the nucleus is treated with staining reagents the chromatin granules of the fibrillar network and the nucleoli become stained, and are thus rendered visible.

The "centrospheres," otherwise known as the "directing spheres," or "tinoleucites," are closely associated with the nucleus. They are spherical in form, and consist of a central particle (the "centrosome") surrounded by hyaloplasm and bounded by a granular outline. There are normally two of these bodies connected with the nucleus of the cell. They play an important part in the process of cell-division, termed "karyokinesis," in which they take up their position on opposite sides of the nucleus.

The "plastids" are differentiated portions of the protoplasm, which, like the nucleus, multiply by division. They appear to consist of a ground-substance, composed of a proteid body termed "chloroplastin," which is similar to the cytoplastin of the cytoplasm; in this are imbedded fibrils, denser at the surface, consisting also of a proteid material, "metaxin," which appears to be peculiar to the plastids. The plastids may be divided into two classes:—

1. The colourless ones, which are termed "leucoplastids," "anaplasts," or "leucites" proper.

2. Those which are coloured are termed "chromatophores." The chromatophores are distinguishable as "chloroplastids," "autoplasts," or "chloroleucites," when they contain the green colouring matter chlorophyll; or as "chromoplastids," "chromoplasts," or "chromoleucites," when they contain no chlorophyll, but some other colouring matter.

These various names have been given by different workers. The following table shows very clearly the nomenclature employed and the authors of the different terms*:—

| | | Older Nomenclature. | Schimper. | Meyer. | Van Tieghem. |
|---|---|---|---|---|---|
| General term . | | | Plastid | Trophoplast | Leucite. |
| Special term | | Colourless protoplasmic granule | Leucoplastid | Anaplast | Leucite proper |
| | | Chlorophyll granule | Chloroplastid | Autoplast | Chloro-leucite. |
| | | Colour granule | Chromo-plastid | Chromoplast | Chromo leucite |

Plastids are not found in the fungi, nor apparently in certain algæ (Cyanophyceæ).

The leucoplastids occur in parts which are normally devoid of chlorophyll, such as tubers, rhizomes, etc. Their essential function is to form starch grains. They were first described in all their relations by Schimper, who termed them "starch generators;" they are also known as "amylogenic bodies," which, of course, means the same thing. In parts of plants which, in the ordinary course, become exposed to light, the leucoplastids develop into chloroplastids. Conversely, when a part which is normally exposed to the light is kept in darkness, the chloroplastids become replaced by leucoplastids.

The chloroplastids are so termed because the colouring matter which they contain is most commonly chlorophyll. They are not, however, always green. In some of the algæ they are red or brown, because in addition to the chlorophyll there is present in one case (Rhodophyceæ) a red colouring matter, phycoerythrin, and in another (Phæophyceæ) a brown colouring matter, "phycoxanthin." Both these substances are, however, related to chlorophyll. Meyer believes that the chlorophyll takes the form of minute grains, which are dispersed over the whole substance, but Tschirch holds that the pigment, dissolved in a liquid similar to the ethereal oils, is diffused through the mass. When the colouring matter is dissolved out by alcohol or some other solvent, the protoplasmic plastid is left colourless.

The function of the chloroplastid is two-fold. In the first place they can, like leucoplastids, generally produce starch grains, and secondly, they are capable, in virtue of the chlorophyll which they contain, of constructing organic subtance from carbon dioxide and water under the influence of light. Their function, therefore, is amyloplastic or starch-forming, and also assimilatory. These two functions are usually performed simultaneously; but while assimilation can only proceed in the presence of light, starch grains can be built up in darkness, just as they are in leucoplastids, the organic substance necessary for their formation not being produced in the chloroplastid, but supplied from other parts of the plant.

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* Gray's 'Text-Book of Botany,' part ii. (Goodale).

The form of chloroplastid occurring in the higher plants is the chlorophyll corpuscle, which is flattened and discoid. Usually there are many corpuscles in a cell, but occasionally (*e.g.* Anthoceros) there is only one. Schmitz has described very fully the chromatophores of the algæ. They possess considerable diversity of form and size. In most green algæ there are also found one or more minute, rounded, granular, colourless bodies embedded in the chromatophore, known as "pyrenoids." They consist of a homogeneous mass of proteid substance, and are frequently associated with granules of starch; they may, in fact, be regarded as masses of reserve material. Chromatophores increase only by the process of division, but the pyrenoids either by division or fresh formation. In many cases the green colour of parts of plants containing chloroplastids is masked (as in the leaves of the copper beech) by the presence of other colouring-matter held in solution in the cell-sap.

The chromoplastids are closely allied to the chloroplastids. They occur most commonly in the cells of yellow floral leaves and the superficial cells of fruits of a red or orange colour.

The reddish-yellow colour of the root of the carrot is not due to chromoplastids, but to the presence of leucoplastids, in each of which is a large orange-coloured crystal of a substance termed "carotin."

A discussion followed, in which the Chairman, Messrs. Hill, Potter, Bryan, Crouch, Lander, and the Secretary took part.

A paper on "Malt and Malting" was then read by Mr. A. E. Skinner, who gave some interesting historical details relating to malt and the liquors brewed from it, and then proceeded to describe the advantages possessed by barley over other grains for this purpose, and the processes by which it was converted into malt. This part of the paper was illustrated by specimens of different varieties of barley and grain in different stages of the process. Finally, the chemical changes undergone by the constituents of the grain, the tests of its quality, and some of the preparations of malt were described.

The paper gave rise to a discussion, to which the Chairman, Secretary, Messrs. Bryan, Crouch, and Potter contributed.

It was resolved that the Executive Committee should be entrusted with the duty of making arrangements for botanical excursions on Saturday afternoons.

The meeting then adjourned.

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## CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual general meeting of this Association was held on Thursday, May 3, the President (Mr. E. F. Harrison) being in the chair.

After the minutes of the previous meeting had been read and confirmed, the President called upon Messrs. Garnett and Sarson to act as scrutineers of the voting papers, and Messrs. Dunning and Long to audit the balance sheet. While this business was being transacted the President said he had great pleasure in announcing that the council had awarded the prize for practical work and the Association's silver medal to Mr. A. Gunn for his papers, entitled "A New Method for the Detection and Estimation of Oxalic Acid," and Cantharidine," and he hoped Mr. "Gunn would be stimulated by receiving the prize to still better efforts in such practical work, and that others would also be encouraged to record the results of their own work in the same way.

The annual report was then read.

### Annual Report.

The council has much pleasure in presenting this, the seventeenth annual report.

During the past session 53 new members have been elected, making the total membership 155; several new patrons have also been elected, the total number now being 48. During the session twenty-four papers on scientific and trade matters have been read and discussed at the evening meetnigs, and in addition three discussions on important subjects have been held. At two of these, resolutions relating to a possible code of pharmaceutical ethics were passed and forwarded to the Pharmaceutical Society, and have been favourably received and considered. Of the twenty-seven contributions, twenty-two have been by members of the Association. Five musical and social evenings have been held, and all were well attended.

The annual conversazione, held at the Portman Rooms, on Thursday, November 16, and the dinner at the Cannon Street Hotel, on Thursday, March 8, presided over by T. H. W. Idris, Esq., J.P., were both very successful evenings, and the numbers present on each occasion show the appreciation which these events meet with.

The attendance during the session has been well maintained, the average number present being thirty; the highest attendances were upon the evenings when the inaugural address and Dr. Luff's paper were read.

A delegate has been appointed to represent the Association at the federation of local associations, in response to the invitation of the provisional committee of that body. He has further been instructed to introduce the question of the proposed "Code of Ethics" to the notice of the federation.

The council regrets its inability to award the essay prize this session, but have great pleasure in being able to award the prize for practical work and the Association's medal to Mr. A. Gunn for his two papers entitled "A New Method for the Estimation of Oxalic Acid," and "Cantharidine."

The question of the advisability of arranging Sunday outings in connection with the Association has been under consideration during the session, but has been postponed for final settlement by the new council.

The Association has received a present of a valuable herbarium from Mr. S. M. Burroughs, and arrangements have been made for the circulation of the specimens amongst the members. There has also been an increase in the number of books in the library.

The balance sheet shows a very satisfactory financial position, and £1 16*s*. 6*d*. has been forwarded to the Benevolent Fund of the Pharmaceutical Society as the result of the distribution of programmes at social evenings.

In moving the adoption of the report, the President remarked that the session had been a satisfactory one; of the discussions held, the second one, upon "Pharmaceutical Ethics," was the outcome of the first, upon company trading, and the manner in which the resolutions had been received by the Pharmaceutical Society was very satisfactory. The members ought to congratulate themselves upon being represented at the federation of local associations. The library, although still small, had increased during the year, and might form the nucleus of a good collection some day. Mr. Rogers briefly seconded the adoption of the report, and mentioned his satisfaction with Upon being put to the meeting the report was adopted unanimously. In the absence of the Treasurer, the Financial Secretary read the balance sheet, audited by Messrs. Long and Dunning, which showed a balance in hand of £38 7*s*. 11½*d*., as against £32 11*s*. 4*d*. last year.

The President, in moving the adoption of the balance sheet, pointed out that the balance in hand was considerably better than at the beginning of the session. This was due partly to the fact that they had arranged more favourable terms for the rent of the rooms, the benefit from which, however, would be chiefly felt in succeeding sessions, and partly to general economies. In addition to increasing the balance, they had paid off a debt which had been standing some time.

Mr. E. J. Parry seconded its adoption, and drew attention to the fact that the amount received for the publication of reports was low again this session. This was, however, answered by Mr. Jones, who stated that the council had the matter under consideration. Upon being put to the meeting, the adoption of the balance sheet was resolved upon unanimously.

The scrutineers reported upon the election as follows:—

No. of voting papers received, 91.
No. „ „ valid, 91.

The candidates received the undermentioned number of votes:—Gane, 60; Harrison, 60; Jones, 58; Robins, 56; Sage, 56; Strother, 55; Tickle, 53; Ellwood, 51; Rogers, 51; Stead, 51; Hill, 49; Parry, 46; Long, 45; Roe, 43. The above fourteen will form the new council. The votes for the unsuccessful candidates were:—Andrews, 42; Anderson, 41; Goatcher, 41; Plant, 41; Gunn, 39; Morley, 39; Carr, 38; Brooke, 37; Hall, 33; Skinner, 33; McConnell, 32; Morgan, 32.

The President then read his—

### VALEDICTORY ADDRESS.

Gentlemen,—It is my duty, at this last meeting of the session, to resign to you the office with which you entrusted me at its commencement, and, in doing so, to offer a few comments on the condition of the affairs of the Association since that time.

I think we may say that we have had a fairly satisfactory session. We have, it is true, a slightly decreased membership, but too much importance must not be attached to this. During the previous one or two sessions our numbers were increased considerably by the efforts of one or two particular members, who have been unable to show the same activity this session, and this fully accounts for our smaller number; but there has been an improvement rather than otherwise in the number of new members proposed in ones and twos by the rank and file, which is a very satisfactory sign.

Our numerical strength, however, is by no means the most important criterion of progress. Have we done anything, have the meetings been well attended, and the discussions well maintained? Well, you have just been told in the report how many papers have been read, and your memories will serve you fairly well as to the subjects of the papers. We have had more evenings than usual devoted to not strictly scientific matters; for instance, there were the papers referring to pharmaceutical training and to the result of it. Then, again, there are the discussions that have been held on matters of pharmaceutical politics, on the questions of company trading, a code of pharmaceutical ethics, and the admission of chemists and druggists to membership of the Pharmaceutical Society. Discussions of this kind may appear to have little enough result at the time, but they may sow the seeds of much that is good for the future, and they cannot fail to increase the attention given by assistants to such matters. Then the attendance at nearly all the meetings of the session has been good, and the discussions fairly brisk, though I must own that here I think there is very much room for improvement. The majority of us are very greatly in need of practice before we can consider ourselves at all able hands at discussion.

Now, all our experience and knowledge gained from a review of the past are of value chiefly for the assistance we can derive from them for our guidance in the future, and I should like to offer a few remarks on the application of our past experience here to the future administration of the affairs of the Association. If this appears rather out of place in a valedictory address, I can only say by way of apology that I think one is better qualified to speak on the subject when putting off the harness than when putting it on.

What, then, are the conditions essential to our success? Or rather, first, what do we want to succeed in, what can we succeed in? We want, I take it, to be a chemists' assistants' association in the fullest and widest sense, and this is not an impossible standard to set before us. We can do all that we do now, and no doubt we can do much of it better than we do. We must aim at an even higher standard in our papers, both in the subjects and in the quality of the work. I think very strongly that we should go much further than we have ever yet gone in the discussion of what I may call pharmaceutical politics. There are many matters which are of almost vital importance to us as chemists, on which we must get right ideas, and we cannot develop our ideas better than by these discussions among ourselves. I think we most advance much here. Then we may do more also in the development of the much-needed sociability among assistants; there is no need to be sociable only once a month, on those evenings specially set apart for it; let the tone of our gatherings always be such that an assistant coming in for the first time shall very quickly feel at home. And I think, as an association, we should be alert and alive to any and every way of being helpful to assistants of all grades.

It is necessary that we should recognise fully our limitations. We occupy a position very different from that filled by any local association of men in business. Perhaps the most notable difference lies in the fact that the *personnel* of the Association is ever changing; more than a third of our members leave us every year, and their places are taken by new ones. Then, again, we are nearly all young men, and can scarcely expect or wish to make final pronouncements; in short, development must be our watchword. We are a sort of training ground for more mature associations or for the Council of the Pharmaceutical Society. The immediate question for us, then, is how, with our ever shifting *personnel*, are we to get the best results? First, by an active and wideawake condition of every individual member. Secondly, by ensuring that the official positions of the Association are always held by the best men in the junior ranks of pharmacy. This, I think, has usually been the case, as is shown by the fact that nearly all our past officers are now holding high and responsible positions; but it is necessary that we should keep this necessity before us, that the best men may be attracted into our ranks by seeing here a field for their abilities and energies. The Association must not get a name for being a mechanically worked thing that anybody could run; precedent must not be under-valued, but it must not over-ride everything else.

I trust you will pardon me for having occupied you so long with these observations about the future, but I am compelled to regard it as more important, practically, than the past. Adverting now for a moment to personal matters, I feel that in my year of office the balance of advantage lies greatly on my side; the experience I have gained has far more than repaid any service I have been able to render. I have been aware of many shortcomings in myself, more so, I venture to think, than most of you, and for these I have to ask your pardon; and so, gentlemen, in my present capacity I bid you farewell.

At the conclusion, Mr. Rogers proposed and Mr. Ellwood seconded a very hearty vote of thanks to Mr. Harrison for the able manner in which he had filled the chair, both at the ordinary evening meetings and the council meetings, and also for his valedictory address. Mr. Harrison having briefly responded, the proceedings terminated.

# Provincial Transactions.

## SHEFFIELD MICROSCOPICAL SOCIETY.

A general meeting of the above Society was held on Tuesday, May 1, the President, Mr. J. Newton Coombe, in the chair. There was a large attendance.

A practical demonstration on the "Development of a Bird" was given by Professor Denny, F.L.S. The structure and composition of the egg was first explained; then followed the development of the chick embryo during incubation. About a dozen slides of chick embryos of different ages were shown, these ranged from a few hours to five days, the "branchial clefts" being well marked in some. The following novel and very successful process was used in the preparation of these slides. The embryo is washed in clean water once or twice, then place in osmic acid (1 per cent. solution) for a short time, this fixes and also stains a brownish-black; then soak in Müller's fluid for a day or so, and afterwards clean in clove oil. Mount in balsam. The differentiation in structure by using osmic acid alone is complete, being far superior to hæmatoxylin or any other stain. On the motion of the President, seconded by Mr. Arnold T. Watson, a hearty vote of thanks was accorded the lecturer.

## CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

On Thursday, April 26, Mr. Alderman Deck delivered an interesting lecture on "Ballooning," under the auspices of the Cambridge Pharmaceutical Association, in the room adjoining the Three Tuns Temperance Hôtel, St. Edward's Passage, Mr. A. S. Campkin presiding. The lecturer detailed the early essays in ballooning, and showed a model balloon of his own construction. He also described ascents he had made, and some of the beautiful phenomena that might be seen when amongst the clouds, and with the aid of some fine coloured views illustrating different phases in his own aeronautical history, succeeded in conveying a vivid idea of the subject to his audience. On the proposition of Mr. A. S. Campkin, seconded by Mr. G. Peck, a hearty vote of thanks was passed to the lecturer, who acknowledged the compliment.

# Parliamentary and Law Proceedings.

## PROCEEDINGS IN THE COURT OF CHANCERY.

### IN RE D. WILKINSON'S PATENT
### (NO. 5445 OF A.D. 1893.)

In the Chancery Division of the High Court, on Saturday, May 5, the petition of the Pharmaceutical Society of Great Britain for the revocation of Letters Patent No. 5445 of 1893, in respect of a cancer cure consisting largely of corrosive sublimate, was heard before Mr. Justice Kekewich.

Mr. Roger Wallace appeared for the petitioners, the respondent appeared in person.

Mr. Roger Wallace: May it please your Lordship I appear for the petitioners, the Pharmaceutical Society.

Mr. Justice Kekewich: Is this petition opposed?

Mr. R. Wallace: Yes, it is opposed.

Mr. Justice Kekewich: Then I will take it later on. Who appears for the respondent?

Mr. R. Wallace: The respondent appears in person, and he consents to the revocation.

Mr. Justice Kekewich: You just told me it was opposed.

Mr. R. Wallace: It is opposed in that sense, that the respondent appears.

Mr. D. Wilkinson: I appear for myself.

Mr. Justice Kekewich: Are you the patentee?

Mr. D. Wilkinson: Yes, my Lord.

Mr. Justice Kekewich: What do you say about this?

Mr. D. Wilkinson: I went into the minute parts of the different articles of the patent, which is to take tumours, abscesses, and cancers out.

Mr. Justice Kekewich: Do you object to this petition?

Mr. D. Wilkinson: No. They granted me a patent.

Mr. Justice Kekewich: Do you wish to argue it?

Mr. D. Wilkinson: I consent to anything that is legal and lawful.

Mr. Justice Kekewich: You have got a patent.

Mr. D. Wilkinson: Yes.

Mr. Justice Kekewich: The petitioners, the Pharmaceutical Society, say that your patent is a bad one, and that it ought to be revoked—do you understand that?

Mr. D. Wilkinson: I am quite willing to have it revoked if it is not lawful.

Mr. Justice Kekewich: They ask that the Court shall make an order revoking your patent. Are you willing that that should be done?

Mr. D. Wilkinson: Yes.

Mr. Justice Kekewich: Very well. I suppose, Mr. Wallace, this petition proceeds on the same lines as the one that was recently before Mr. Justice Stirling?

Mr. Wallace: Yes, my Lord, it is the same class of case. The proceedings are taken by the Pharmaceutical Society under the provisions of the Act with a view of protecting the public.

Mr. Justice Kekewich: You understand, Mr. Wilkinson, that your patent is gone?

Mr. Wilkinson: Yes.

Mr. Justice Kekewich: Very well.

## POISONING CASES AND INQUESTS.

### DEATH FROM OVERDOSE OF PRUSSIC ACID.

An inquest was held on Thursday, May 3, at Rastrick, relative to the death of John Heaton, chemist, aged 25, who died on Tuesday, at the residence of his father, in Gooder Lane, Rastrick. Deceased had suffered from sleeplessness, and had been taking drugs. A verdict of "Death from misadventure by an overdose of prussic acid" was returned.—*Yorkshire Post.*

### CHEMISTS' PRESCRIPTIONS AND DEATH CERTIFICATES.

On Wednesday, May 8, Mr. E. Hooper, coroner, held an inquest at the Beach Tree Inn, Blackheath, Dudley, respecting the death of Elizabeth Grove, aged four days, the illegitimate child of Annie Grove, who resides in Hickton's Building, Tump Road, Blackheath.

Mary Smith, midwife, said that the mother was confined on April 24. The infant was weakly, and had a large wound on its back. On the advice of the mother, witness took the child to the shop of Mr. Barlow, chemist, who, after examining the child, advised [illegible] to take it home and keep it warm. Witness [illegible] showed Mr Barlow deceased's back, and he gave [illegible] a box of ointment, which he told her to apply on a piece of linen rag. The box was unlabelled, and he charged her a shilling for it. Witness asked Mr. Barlow if he would give a certificate of death, and he replied in the affirmative. Witness took the child home, and did not trouble about having a medical man, because she thought that Mr. Barlow, who would give a certificate, was sufficient. The child shortly afterwards died. In reply to the coroner, witness said she thought Mr. Barlow was sufficient, without going to a medical man. The coroner cautioned her to be more careful in the future. She, as a midwife, must certainly have known that a chemist had not the slightest qualification or right to attend people in illness or give certificates.

Joseph Barlow, a registered chemist, Halesowen Street, Blackheath, said he had been practising in Blackheath for about twenty-three years. He denied that he told the midwife that he would give a certificate in case the child died. Since he had been at Blackheath he had been attending poor people, and had had three or four cases. His practice was where the cases were serious to advise the attendance of a medical man. He admitted charging one shilling for prescribing, and promising that if the child grew worse he would attend at the house. He was aware there was a parish doctor, and admitted having prescribed for a child named Bridgwater, who had a cold. He did not make a practice of prescribing. He was not aware that the people in that neighbourhood believed that he was a medical man.

The coroner said he would leave the matter for another court. He intended to put a stop to that kind of practice, and he gave Mr. Barlow fair warning that if another person was buried on any certificate he gave he should have the body exhumed. In summing up to the jury, he said he considered Mr. Barlow had taken a very important part in the matter. If that kind of thing was allowed in any neighbourhood serious results might occur. It would open a door to many evils which the law was trying to prevent. He should report Mr. Barlow to the Pharmaceutical Society. He should also require to know whether Mr. Whitehouse (registrar) had on any other occasions given certificates on any notes from Mr. Barlow, and if so he should be compelled to report him to his superior officer.

The jury returned a verdict of "Death from natural causes," but added a rider to the effect that death had been accelerated by want of proper medical treatment. They requested the coroner to censure Mrs. Smith, the midwife, and the mother, and also considered that Mr. Barlow had erred in not sending the woman to a doctor.

The coroner, in censuring the midwife, said the case was a very cruel one, and he considered she was not fit for the work. He disallowed her expenses. Addressing Mr. Barlow, he remarked that he had been guilty of a breach of the law by arranging to attend the child at home, and by receiving fees for doing so. If he broke the Act a second time he would not hesitate to commit him for manslaughter.—*Birmingham Daily Post.*

## PROCEEDINGS UNDER THE WEIGHTS AND MEASURES ACTS.

On Friday, May 4, at the Lincoln City Police Court, before Dr. Mitchinson (in the chair), Mr. R. Hall, and Mr. J. Jekyll, Charles Edward Harston, 56, Burton Road, chemist, was summoned for having in his possession thirteen weights which were unstamped. Sergeant Bradley stated that he visited defendant's shop on Monday morning, and he found in the drawer of his dispensing scales thirteen weights which were unstamped. On a shelf at the back he found three measures which were unstamped. Some of the weights were too heavy. In extenuation, defendant said he had no idea that the weights were not stamped, as he had sent the scales down twice. The scales were stamped, and not the weights. He had been using them all the time, believing that both the scales and weights were stamped. The magistrates did not think there was any intention to defraud the public, but it was contrary to law. They did not intend to take a serious view of it, and inflicted a fine of 10*s.*—*Nottingham Guardian.*

## Reviews and Notices of Books.

A STUDENTS' TEXT-BOOK OF BOTANY. By SYDNEY H. VINES, M.A., D.Sc., F.R.S. First Half. Pp. i.-ix., 1 to 430. With 279 illustrations. 7*s.* 6*d.* (Swan Sonnenschein and Co., London.)

In this new text-book of botany we have one which is intended by the author to supersede the old translation or adaptation of Prantl's handbook, which has held its own more or less successfully for the last ten or fifteen years, and has served as the leading introductory text-book of the subject. Each succeeding edition of this has, however, shown more or less clearly that it is an unsatisfactory book to put in the hands of a student, and now Professor Vines has introduced to us the first half of a new work which, while going somewhat on the lines of the old Prantl and Vines, and indeed introducing certain sections of the latter, is so far extended as to be practically a new work. From the preface we gather that Professor Vines still contemplates that the book will be essentially a student's book, and continue to serve as an introduction to this subject. How far that expectation will be justified is, of course, a question which can only be solved by time and experience.

The first part, which has just appeared, is only called by the author the first half, not the first volume; so that the work, when completed, will be still a single book, though its dimensions will be much greater than those of the old Prantl. The work opens with a description of the general morphology of plants, which is discussed at some length, occupying eighty-eight pages. The whole of the forms of vegetable life existing have been brought under review, and the same laws of morphology are shown to extend throughout the whole of the vegetable kingdom. The old idea that the flowering plant was the one great effort of nature, and the only one to be thought of when the term plant was employed, has been finally disposed of. The idea of a supplementary sort of vegetation of an altogether inferior order, worthy only of brief discussion in a few odd chapters, and indeed of altogether subsidiary importance, has no place in the new text-book, and the morphology of cryptogam and phanerogam is discussed together, and their relationships shown. The lowest members of the former class are shown to be possessed of forms which are strictly comparable in outward appearance to those of the highest phanerogams, though their structure is not so complex. Thus the idea of leaves and stem in the algæ, only claimed by most to exist in such plants as *Chara*, is now put prominently forward, and that of a branched axis with ultimate appendages differing from it is shown to be common to most forms.

The division of the plant body usually into the two sections of root and shoot, suggested by Sachs, has received a good deal of development, and is shown to exist even down to the filamentous algæ, and to be present in comparatively humble fungi. The dependence of the distinction between stem and root upon anatomical characters is shown to be misleading, and the physiological action is insisted upon as a clue to correct diagnosis. The same idea of the essential unity of the vegetable kingdom is well brought out in the treatment given to the subject of the alternation of generations. We find for the first time put prominently forward and insisted upon that the rule is for every plant to possess in its life cycle two distinct forms or phases regularly alternating with each other. This is now claimed as prominently for the higher phanerogams as for the vascular cryptogams and mosses, in which group the two forms most nearly approach each other. The alternation is shown also to be traceable in the group of thallophytes with more or less completeness, and the homologies are pointed out. The student for whom the work is intended will, however, find much in these early chapters which will need much close application and study. The sections which deal with the symmetry of the body of plants are extremely uninviting, and coming as they do quite early in the volume, present difficulties to the beginner which recall the old idea that it was necessary at the outset to master a very dry terminology, and to almost bury oneself in bewildering details of variety of forms. This part of the work is perhaps the least satisfactory, and seems to be pressed beyond the point at which it will interest one who is first taking up the subject.

In the second section of the work, pages 89–215, we have the minute anatomy of plants discussed. Here, as in the other part, we have the whole of the vegetable kingdom treated as a unity, and the old distinction between the anatomy of dicotyledons, monocotyledons, and cryptogams makes no appearance. The author first discusses the anatomy of the cell, then that of the tissues. The most recent researches upon the processes of cell division are incorporated into the text; indeed, one almost fancies the author too ready to accept as facts details which may still be thought to be in the region of controversy. In the discussion of the tissues and their arrangement we find the new "stele" theory of Van Tieghem very clearly put forward. It is a little unfortunate, perhaps, that in the discussion of the tissues of the axis the author allows himself to speak of "fundamental" tissue still, dividing it into extra- and intra-stelar respectively. The idea of fundamental tissue as a basis of structure, supporting as a kind of packing material the fibro-vascular bundles which are developed in it, is rather antagonistic to the idea of the central stele possessing an individuality of its own, and serving as the seat of the development of the bundles.

The third section of the work is incomplete; it is a sketch of the classification of plants, and deals in considerable detail with all the forms up to the highest vascular cryptogams. Here the first half of the work breaks off, leaving the phanerogams to be discussed in the succeeding part. The Algæ are treated as completely as is possible in an introductory work; indeed, this section is very full of detail. The homologies are well worked out, and the distinction between gametophyte and sporophyte is illustrated wherever possible. The true nature of the latter in the Florideæ and the Coleochætæ is now pointed out. In the treatment of the Fungi the author proceeds upon the old lines of the De Bary school. It is a little disappointing not to find more reference made to the later work of Brefeld and his followers.

The work contains thus a very fair, but rather compressed, account of the present state of botanical knowledge. The author appears to have tried to include as much as possible of recent work, and yet to present it in such a form as to train a student. The task of combining these two objects is one of very great difficulty, and only time will show how far he has succeeded in solving the problem he has set himself. The student will probably regret the necessity of the introduction of so many new terms, of which the author makes very free use. The terms, however, are not brought in unadvisedly, though they will commend themselves more to a reader who has already an acquaintance with the subject. The systematic botanist will, no doubt, take exception to familiar terms being employed in a new sense. Thus, the term "monœcious," which has a definite acceptation in systematic botany, implying a plant which bears staminate and pistillate flowers only on the same individual, is applied by the author to every case in which the same individual bears both stamens or carpels, whether they are both in the same flower or not.

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**Étude Monographique de la Famille des Globulariées, au point de vue Botanique, Chimique, et Thérapeutique.** Par le Dr. Edouard Heckel, avec la Collaboration de M. le Professeur Schlagdenhauffen pour la Partie Chimique, et de M. le Dr. J. Mourson pour la Partie Thérapeutique. (G. Masson, Paris.)

The natural order Globulariæ, which by English botanists is sunk under Selagineæ, is not one that seems to have great claims upon the consideration of pharmacists or pharmacologists from a medicinal point of view. In the Introduction, Mr. Heckel consequently gives his reasons for making so complete a study of the plants of the order. The genus *Globularia* is well represented in the south of France, and living specimens are procurable without difficulty. Moreover, this family, although well defined by characteristic features, is related to several others, so that its exact position in the natural system has been subject to much discussion. Of late years there has been a growing tendency to believe that the anatomy of plants should have considerable weight in determining their position in the vegetable kingdom, and that their chemical constituents and physiological action should not be altogether neglected as affording an additional clue to their true relationships.

In the botanical portion, Dr. Heckel describes in detail the histological characters of the following species :—*Globularia vulgaris*, L.; *G. trichosantha*, F. and Mey.; *G. tenella*, Lange; *G. ilicifolia*, Willk.; *G. incanescens*, Viv.; *G. orientalis*, L.; *G. salicina*, Lamb.; *G. stygia*, Orph.; *G. cordifolia*, L.; var. *bellidifolia*, var. *intermedia*, var. *nana*, Rouy; G. *nudicaulis*, L.; *G. alypum*, L., and *G. arabica*, J. et Sp. He contrasts the general anatomical characters of this genus with those of Selagineæ and the Myoporineæ, and finds that these confirm the method of classification adopted by Bentham and Hooker, and that the Globulariæ and Selagineæ are closely connected, whilst the Myoporineæ, although morphologically connected with the Globulariæ, are histologically distinct in the structure of their leaves and bark.

M. Schlagdenhauffen, in the chemical portion of the work, finds in *Globularia alypum*, L., a bitter glucoside, globularin, which splits up on hydrolysis into glucose and globularetin, a resinous substance containing as one of it constituents cinnamic acid, by which the presence of the drug can be partly recognised in a decoction of the plant. Two other species, *G. nana* and *G. vulgaris*, each representing a different section of the genus, were also analysed and found to contain the same constituents. In the therapeutical section Dr. J, Moursou points out that *Globularia alypum* is a dangerous purgative in unskilled hands, since its action is usually not manifested for twenty-four hours, and then continues for two days or longer. He finds that globularin possesses antipyretic properties, slows but strengthens the action of the heart, and increases peristallic action, whilst globularetin is decidedly purgative and acts upon the kidneys as a diuretic, increasing the amount of solid matter in the urine. The volatile principle also acts as a diuretic, and the cinnamic acid adds to the purgative action by local irritation of the intestine, whilst at the same time exercising a sedative action on the circulation. The work is very carefully done by the three collaborateurs, and the histological figures will be very serviceable to future students of this group of plants.

# Correspondence.

### A CORRECTION.

Sir,—Will you oblige me by allowing me to correct the misreporting of the quotation from Wordsworth I used to garnish my remarks at the last meeting of the Council? It will be well, I think, to requote the lines :—

> "The primal duties shine aloft like stars,
> The charities that soothe and heal and bless,
> Lie scattered at the feet of men like flowers."

*71, Aberdeen Road,* ROBERT HAMPSON.
*Highbury Park, N.*

### THE BENEVOLENT FUND ADMINISTRATION.

Sir,—I heartily sympathise with Mr. Hampson's desire to secure the election of those candidates for annuities who are most in need and most deserving of our sympathy. Many years ago I adopted the plan of voting only for those candidates who sent no canvassing cards or circulars, and who had apparently no friends to promote their election. If many subscribers would do the same, and make it known that such was their custom, it would do much to discourage the wasteful expenditure which the candidates at present feel they dare not curtail. More recently I changed my policy, feeling that it was abortive so long as there was not united action, and it sometimes led to my not voting for some candidate who, on an examination of all the evidence at my command, appeared to be in urgent need. I therefore took to destroying the canvassing cards as received, and when the voting paper came basing my selection purely upon the evidence supplied by the Committee, but still with the feeling that the Committee could have finished the work of selection better than it was possible for outsiders to do it from their list. I quite agree with Mr. Young that the large number of members who do not vote abstain from doing so in consequence of ideas similar to my own. Mr. Schacht gives us evidence that many people say "I should be very sorry to lose my voting power," but the evidence of fact is that a great many voluntarily do lose their voting power rather than make their selection and send it to the post. Mr. Grose objects to the voting power being taken away from subscribers, and in so far I agree with him. I should not like to deprive any subscriber of the right to vote when he had made up his mind as to who were the best candidates, but there is still the evidence quoted by Mr. Young, that many potential voters do not wish to exercise this power. We also have the evidence of Mr. Southall and Mr. Harrison that the public are satisfied with the policy of leaving the selection in the hands of a committee of those who are most competent to do it well. Mr. Martindale thinks Mr. Hampson is right in the abstract, and I think Mr. Martindale is wrong in the concrete. He says "the Fund is distributed with the least possible cost to the candidate, and with the greatest benefit to him." This might be true if there were only one candidate, but under present circumstances it is not true of those candidates who incur printing and postage in the hope of securing votes. Nor is it true of any deserving candidate who fails of election. It is said that the devil can quote scripture to suit his own purpose. But Mr. Hill is not so clever as that astute old gentleman, or his quotation fails to answer his purpose. If God had made the Benevolent Fund, the probability is that He would have made it for the grocer and draper, as He made the sunshine and the rain, which may be regarded as the equal property of all who take equal measures to possess themselves of them. But parasols, waterproof coats, and benevolent funds are not provided for us ready made by Nature. By Nature we are possessed of intellect, judgment, and conscience—physical powers, and a world full of raw material out of which by the processes of civilisation we evolve parasols and benevolent funds according to the dictates of our conscience and judgment, without being bound to distribute them equally among the just and the unjust. God sends His sunshine upon fields that are parched for want of rain, and He sends rain upon fields already flooded. We should not be obeying the dictates of conscience and the light that is given us if we were to attempt to go and do likewise. God's ways are not our ways, and the chief aim of an enlightened civilisation is to counteract the painful anomalies with which we are surrounded, and which God's spirit within us tells us it is our duty to ameliorate. The law at present provides that the Benevolent Fund is for the benefit of those who justly claim the title of chemist and druggist, and Mr. Hill himself would hesitate to place the unjust claimants upon an equally good footing.

Mr. Carteighe's comments upon Mr. Hampson's objection to votes being gained by canvassing are very illogical; it would be no worse to elect one candidate who is less deserving than it is to elect three such while the urgent cases are unsuccessful for want of influential friends who can promote their candidature. And his statement that 10,000 votes may be given to one candidate when 2000 would secure his election—thus 8000 votes are lost—is no condemnation of Mr. Hampson's views, but a strong condemnation of the present system of election. On the other hand, I quite agree with Mr. Carteighe that it is some solace to the unsuccessful to receive a temporary grant, and to have the votes registered in their favour carried to their credit at the next election. While I sympathise more with the views expressed by Mr. Hampson and Mr. Harrison than with those enunciated by any other of the speakers at the meeting, I do not feel that I could adopt the plan proposed by the former, nor that of the latter, unless the unfolding of the same in committee should display advantages not yet visible. I must admit that there is some truth—perhaps I should say much truth—in the statement that the average man who subscribes to the Fund likes to receive voting papers and to feel that he has the right and the power to use them when so inclined. But I would like to see a note appended to the list of candidates, stating that any one receiving a paper and not wishing to exercise his privilege of selection might sign the same and return it to the Secretary, when the votes to which he was entitled would be distributed according to the best judgment of the Committee. This would meet the objection raised by Mr Gruse, and supported by Mr. Schacht, that anyone might feel that his voting power had been taken away from him. This method would remove from Mr. Hampson's plan any risk of the disastrous effects which various speakers think his method would have upon the popularity of the Fund, and it would leave the Committee with the power of a casting vote in favour of any urgent case which had not been sufficiently appreciated by the general voting body. I think it would do something towards discouraging the issue of circulars begging for support, though not so much as I would like to do in this direction, if I could see an unobjectionable way of exercising more force. And that I do not see, except in a recommendation to voters to regard the receipt of a circular advocating the cause of any candidate as an indication that he had friends to look after him, and was in so far less in need of support. The fear expressed by the President that the officials would be inundated by appeals would be readily removed by a general announcement that such action would tell against the chances of the candidate.

*Grey Street, Newcastle.* BARNARD S. PROCTOR.

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### OPIUM ASSAY.

Sir,—Pressure of business and the performance of some necessary experiments conspired to prevent me from at once giving Mr. E. J. Millard the explanation he demanded (*ante*, p. 881). In my contribution to the discussion on the United States Pharmacopœia (*ante*, p. 785), I called particular attention to the fact that the morphine obtained by drying at 100° C., as the B.P. directs, is anhydrous, while that got by drying at a temperature not exceeding 60° C. is crystallised morphine, with one molecule of water. The results in the paper were stated as morphine obtained by the B.P. and U.S.P. methods respectively. If the ·805 anhydrous morphine obtained from the tincture by the B.P. process be calculated to hydrate, it is found to be equal to ·856; this makes the increase by the U.S.P. method 10·05 per cent. Assuming that the morphine obtained in both processes is the same, the increase is about 17 per cent. Mr. Millard remembers that the morphine is anhydrous in the one case and a hydrate in the other, yet forgets to take that into account in his calculation. Similarly the 12·4 anhydrous morphine from the powder is equal to 13·18 morphine hydrate, the U.S.P. process giving 12·93; in this case there is a decrease of 1·9 per cent. Mr. Millard says, "It is generally admitted that the present B.P. process yields results at least 10 per cent. below the truth," and then quotes Conroy in support of this statement. Squire's 'Companion' makes the loss greater, saying about one and a half grains morphine is lost in the process. Conroy got only 9·05 grains morphine as the mean of four estimations from 10 grains of pure morphine. This result has been accepted by, I suppose, all British chemists, and finds a place as an important foot-note in Allen's 'Organic Analysis' (vol. iii., part ii., p. 345). On referring to Mr. Conroy's very useful paper (*Pharm. Journ.* [3], xv., 473) for information regarding the morphine he used in his experiments, there is nothing said beyond that it was pure morphine. Assuming that Mr. Conroy used the commercial article, which is approximately a monohydrate, then the 10 grains employed are equal to 9·4 anhydrous. Until comparatively recently it was understood that morphine dried at 100° C. had the composition B. $H_2O$, that has now been shown to be erroneous, morphine losing all its water at 100° C. (Dott, *Pharm. Journ.* [3], xviii., 701). In order to ascertain whether my assumption were correct or not, two estimations of the water in commercial morphine were made, and a sample was assayed according to the B.P. process for opium. On drying the morphine for three hours at a temperature between 50° and 60° C., the loss was ·16 per cent. in the one determination and ·2 per cent. in the other, and on further drying at 100° C. for two and a half hours, the loss was 6·07 and 6·03 per cent. respectively. The assay of ·5 gramme of commercial morphine by the B.P. process yielded ·454, that is, 10 parts of morphine containing 6 per cent. of water gave 9·08 parts of anhydrous morphine. It therefore follows that, in the light of our present knowledge, Mr. Conroy's results would read thus, that he obtained 9·05 grains anhydrous morphine from 10 grains morphine hydrate, equal to 9·4 grains anhydrous. This accords with the results stated above, and shows that the loss of morphine in the B.P. assay process is not so large as it has for the past eleven years been supposed to be. While the results from the tincture are about 10 per cent. higher by the U.S.P., those from the powder are practically the same. I wish to state here that in every estimation I have made the morphine got by the B.P. method was always lighter in colour and apparently cleaner than the U.S.P. alkaloid. This difference in the results from tincture and powder may be due to the following facts:—(1) In assaying powdered opium according to the U.S.P., the opium is not completely exhausted; on collecting another 20 C.c. beyond the final 20 C.c. directed in the process, acidifying and adding an alkaloidal precipitant, I obtained a very heavy precipitate; (2) in assaying the tincture all the morphine is already in solution, and the morphine precipitated therefrom has more colouring matter entangled with it than that from the powder, and it is very difficult to wash away. In order to gratify Mr. Millard's very laudable desire for light on the subject of the purity of the morphine residues, another assay of powdered opium was made, and the resulting morphine was titrated with *n*/10 sulphuric acid. The results of this estimation are embodied in the following table, along with the estimation of the sample mentioned in my paper, the B.P. anhydrous morphine being calculated to hydrate for the purpose of comparison with the U.S.P.:—

*Morphine from Powdered Opium.*

| | | Anhydrous. | | Hydrate. |
|---|---|---|---|---|
| 1 | B.P. | 12·4 | = | 13·18 (calcd.) |
| | U.S.P. | — | | 12·93 |
| 2 | B.P. | 11·56 | = | 12·29 (calcd.) |
| | U.S.P. | — | | 12·89 |

The charge Mr. Millard prefers against me of being illogical because I did not titrate my former morphine residues does not appear to me to be well founded. The paper only professed to compare the two methods of assay, and gave some results by these methods, and as titration is not enjoined in either case, it did not seem necessary to carry my opinion "to its logical conclusion," especially as it appeared self-evident that titration, if it could be accurately done, would be an improvement. Portes and Langlois, the originators of the process, Dott, Allen, Teschemacher and Smith, and Farr and Wright, all believe in titration of the morphine. Notwithstanding these opinions, my own opinion has, thanks to Mr. Millard, been somewhat modified since I have made a trial of titration in the estimation of morphine. Two factors militate against the precision which should characterise the volumetric estimation of such a body as morphine, these are its high combining weight and the difficulty of determining with accuracy the end-point of the reaction. The results I obtained by titration were to a certain extent comparative (though not sufficiently conclusive to warrant publication), in so far as they showed that the morphine obtained by the B.P. method was purer than the U.S.P. alkaloidal residue, just what one would suppose on looking at them. In conclusion, sir, I would like to point out and emphasise the fact that the results in different processes of opium assay are not comparable among themselves, owing to some estimating the morphine as hydrate—the volumetric processes are conducted with decinormal acid, 1 C.c. = ·0303 morphine hydrate—and comparing their results with the B.P. results, under the impression that the alkaloid from the latter process was also a hydrate, whereas it is anhydrous. All this has helped to bring the B.P. process into disrepute, and give it a character for registering lower than is actually the case. I observe that even Farr and Wright, in one of their classic researches on tincture menstrua (Tincture of Opium, *Chemist and Druggist*, vol. xlii., p. 77), compare the results by the B.P. process with those by the Dott-Teschemacher process, without explaining that the morphine obtained in the former case is anhydrous, and in the latter it is calculated as hydrate. By including in the B.P. process Mr. Conroy's original suggestion to increase the quantities of opium and water used, making a definite allowance for loss, and giving attention to some matters of detail, such as the removal of the ethereal layer by a pipette, and so on, the process would be greatly improved as regards both speed and accuracy. It is to be hoped that a method with so many good points about it, a method which, to use the words of Messrs. Farr and Wright, "is the one best fitted for the use of pharmacists generally, and it is a process which can be conducted behind the dispensing counter quite as well as in a thoroughly equipped laboratory"—will not be lightly discarded.

*Edinburgh.* George Coull.

### The Approaching Council Election.

Sir,—Kindly permit me to invite the attention of my fellow subscribers to the approaching election. If they did but realise how much of their best interests is involved in this annual election, I feel sure that more of them would exercise the power they have, and would try, by a judicious process of selection and elimination, to bring the pharmaceutical Council up to the highest standard of efficiency. I do not wish to be misunderstood; I believe that a very large majority of the present Council are excellent—most excellent—men, and work most energetically with an eye to the well-being of pharmacists at large; and I trust the electors will see to it that in putting new men on the Council they do not, at the same time, let any good friend of the trade at present in office be overlooked. Just a word or two more, especially to the subscribers in and about this district, where approaching Whitsuntide holidays and the Royal visit are likely to disorganise things for a while—just let me say, "Don't forget your voting paper; fill it up, and take care that it is posted in good time—before the 21st inst."

*Manchester.* Harry Kemp.

### The Pharmacy Acts Amendment Bill.

Sir,—The efforts at legislation recently exhibited by the Council concerning the Pharmacy Act Amendment Bill have suggested to me the question, What are the advantages of Major men? I fully concur in granting the privileges of membership (apart from the assumption of the title) upon associates, if this inducement would tend towards better organisation, which to me appears somewhat questionable, but I protest against the alteration of titles as they at present exist. The Major qualification to those in business, or even as assistants, has never seemed to be much of a financial success, and now that the honour attending it is to be also withheld us, what are its real advantages appears a reasonable question. The knowledge obtained is undoubtedly useful, but if the studies be pursued simply for the utility of the knowledge obtained and the interest or fascination attending them, then the examination itself with its attendant expenses would be quite unnecessary. I heartily echo the thoughtful sentiments of "A Minor Man" in your last week's issue concerning our well earned though little appreciated title. I am afraid the sole use of this privilege to many will consist in their proclaiming to the public generally, upon labels and other printing matter, their newly acquired title. If, as some suggest, a fellowship be conferred upon members, then what necessity is there for the alteration of titles. If the popular cry be of a socialistic tendency, for a basis of strict equality, then in fairness to all let us have it by making the Major examination compulsory, or abolishing the Major and increasing the stringency of the Minor, rendering it equivalent to the present Major. The latter would, at any rate, secure equality for all the future aspirants to the trade. To me, the Society itself seems to be doing far more to arouse the dormant sympathy of the trade by the persistent exercise of the legal powers vested in it which have been so characteristic of late, and fully reported in these pages.

*Halifax.* A Major Man.

Sir,—If the Council, in its wisdom, deems it desirable to make any change in the conduct or awards of the Pharmaceutical Society, would it not be advisable to place every chemist now on the Register on one footing, and, to favour unity in the trade, let all enjoy the same privileges and titles, reserving only the title of "pharmaceutical chemist" for Major men, as at present? The proposed additional title of "fellow" is, I think, wholly superfluous, and certainly not necessary to enable a man to carry on business as a chemist and druggist, and will not distinguish, in the public eye, his aptitude for business from that of his registered neighbour. It is the man, not his title, that makes his business. I deprecate any and all changes and additions to existing titles unless they will remove the present distinction between registered and Minor men. The time is ripe now for the obliteration of this distinction on paper, so far as business capabilities are concerned, between the two grades. Let the Society embrace, noting the reservation just mentioned, Major, Minor, and registered men with equal ardour.

M. P. S.

Sir,—While cordially agreeing with the principles of the above Bill, I think that it has one important defect. I submit that since it proposes to extend additional privileges and dignity to two out of the three grades recognised by the Pharmaceutical Society, it ought to provide for this in a corresponding degree as regards pharmaceutical chemists, instead of which, in its present form, it will, by conferring some of the rights of this class on chemists and druggists, proportionately detract from the advantages of their position. This specially applies in the case of those who obtain the higher title through passing the Major examination. The remedy that I would advocate is contained in the suggestion of "Young Member," in last week's Journal, to the effect that every examined pharmaceutical chemist should be styled "Fellow of the Pharmaceutical Society." This would be decidedly more fair, and would, moreover, prevent the detrimental effect which the measure would otherwise have of lessening the inducement to pass the Major examination. This alteration would, in my opinion, render more satisfactory and complete a Bill which is calculated to prove a most desirable piece of legislation, in causing a far greater number of chemists to join the Society, and so promoting that unity among them without which it is impossible to properly protect the interests and raise the standard of their calling.

*Cowes, Isle of Wight.* W. E. Pritchett.

Sir,—It has been proposed that students who pass the Preliminary examination shall be eligible for election as Associates of the Society. Now, supposing a man fails to pass the qualifying examination, or never even enters for it, yet goes into business, styling his shop a "Drug Stores," what is to prevent him from putting up a sign with the inscription "Associate of the Pharmaceutical Society," thereby using the name of the Society to further his own ends and deceive the public?

*Coventry.* H. W. Jones.

### Recipients of the Benevolent Fund.

Sir,—As a very old member and associate of our Society, prior to the charter of incorporation, perhaps I may be allowed to offer a few remarks on the above-named subject, and in the first place to express my unequivocal belief in the principles advocated by Mr. Hampson, based on the law of kindness, and the natural outcome of the teachings of one who "spake as never man spake," the golden rule "to do unto all men as ye would they should do unto you." Unfortunately this axiom is not often acted upon. The worship of mammon is becoming the rule, but it ought not to obtain in a Society that is professedly democratic. If a man is overtaken by misfortune his feelings are no less sensitive, and it must be with reluctance that he applies for a candidature. He has to reveal the full extent of his poverty, and not until he is totally ruined can he expect to participate in the advantage he has wrought to secure, not for himself (as mentioned by Mr.

Atkins), but for those who never subscribed a farthing to the fund. This is injustice. Then the candidate's self-respect must be outraged by the publication of his name in every corner of the civilised world. There are a number of societies—as the Dramatic, the Artistic, and notably the Medical Society—whose poorer members are taken care of, but their names are never published; so that even fellow members are not made aware of their circumstances. We can imagine the sense of degradation that must attend a man who has been thus branded as he goes about amongst his former compeers. I submit that the language of the Vice-President, as reported in the *British and Colonial Druggist*, is unwarrantable and supercilious. "Those poor people" who, although they have spent their little all in the purchase of votes, are to have a "solatium" in order to recoup their expenses. And this is "charity!" But Mr. Walter Hills' definition of the divine virtue—the greatest of the three cardinal ones—eclipses any that I ever met with. "God made His sun to shine on the evil and the good, and on the just and the unjust alike." "That was the true rule in the administration of charity." Does Mr. Walter Hills conceive that he has been appointed by the Supreme Being "to cause His sun to shine on the evil and the unjust?" This blessing is the inheritance of every one of God's creatures, animate and inanimate. If a higher authority is required for a description of charity, I refer to the apostle Paul, who shows that charity and almsgiving are entirely different things. "Although I give my goods to feed the poor, or my body to be burned, if I have not charity (*i.e.*, love) I am but as a sounding brass or as a tinkling cymbal." I do not admire the ring of the President's "stentorian voice," or the trite fallacies he pronounces. The compliment paid to him by the *B. and C. D.* is unusually high. The fiery poetry of Byron has seldom found such an application, but let us hope the fate of Sennacherib will not typify that of the archangel. By the constitution of the Society secretaries are appointed in every part of the country. These gentlemen are chosen in virtue of their intelligence and high moral character. What would be easier when applicants made known their circumstances than to inquire into each particular case, and if on investigation the individual is considered worthy of assistance, or to be placed upon the list of candidates, for the local secretary to report them to the Committee of the Fund, who would thus have the opportunity of being acquainted with all needful particulars, and without publicity, expense, obligation to friends, wholesale houses, etc.; the eleemosynary feature of the grant would cease, and we should feel that an act of real charity had been done to a brother or a sister in the widest relationship. Without any desire to boast, I may say that in former years I have felt deeply interested in the Benevolent Fund—and not without successful efforts.

*Kingston-on-Thames.* R. GOODWIN MUMBRAY.

## Answers to Correspondents.

*A. Ball.*—The specimens are varieties of (1) Dammar; (2) Scammony; and (3) Copal.

"*Aestas.*"—No examination is necessary. To obtain admission you must be recommended by at least three Fellows, and be afterwards duly balloted for. Apply for a form to the Librarian, Burlington House.

"*Live and let live.*"—We quite agree with the opinion you express, that every subscriber to the funds of the Society is entitled to criticise the annual financial statement. At the same time it is not clear from your letter that you possess sufficient information respecting the different items you specify to be in a position to discuss them. In any case, the publication of anonymous criticism would be inappropriate.

*Erratum.*—On page 931, Main, Charles Sinclair, should be Main, George Sinclair.

## Diary of the Week.

### TUESDAY, MAY 15.

*Royal Institution of Great Britain*, at 3 p.m.
"Rubies" (third lecture), by Professor J. W. Judd.

### WEDNESDAY, MAY 16.

*Royal Microscopical Society*, at 8 p.m.
Ordinary Meeting.
*Western Chemists' Association*, at 9 p.m.
Meeting at the Westbourne Restaurant, 1, Crava Road.

### THURSDAY, MAY 17.

*Royal Institution of Great Britain*, at 3 p.m.
"The Solid and Liquid States of Matter" (third lecture), by Professor Dewar.
"The Influence of Moisture on Chemical Change," by H. Brereton Baker.
"Volatile Compounds of Lead Sulphide," by J. B. Hannay.
"A Specimen of Early Scottish Iron," by Margaret D. Dougal.
"The Mineral Waters of Cheltenham," by Professor Thorpe.
*School of Pharmacy Students' Association*, at 7 p.m.
"Tanning," by E. G. Gaul.
"Report on Organic Chemistry," by C. S. Ellis.

### FRIDAY, MAY 18.

*Royal Institution of Great Britain*, at 9 p.m.
"The Splash of a Drop and Allied Phenomena," by Professor A. M. Worthington.
*Quekett Microscopical Club*, at 8 p.m.
Ordinary Meeting.

### SATURDAY, MAY 19.

*Royal Institution of Great Britain*, at 3 p.m.
"Colour Vision" (third lecture), by Captain Abney.
*Quekett Microscopical Club.*
Excursion to Hale End for Highams, starting from Liverpool Street Station by first train after 2 p.m.
*School of Pharmacy Students' Association.*
Botanical Excursion to Rickmansworth. Leave Gower Street at 2.20 p.m.
*Pharmaceutical Cricket Club* v. *Edmonton Liberal Club*, at Edmonton, at 3 p.m.

## Notices to Contributors.

*** *Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.*

*All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names only commenced with capital letters.*

*When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines, must be supplied not later than a week before the proposed date of publication.*

*Communications should reach the Editorial Department before noon on Wednesday, if publication is desired in the next issue of the Journal; though this cannot always be guaranteed.*

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bette, Cracknell, Dowell, Thompson, Wolstenholme.

## PRACTICAL PHARMACOGNOSY.

*(Continued from page 604.)*

### Systems of Tissue.

### *Stem Wood.*

The wood in plant stems consists essentially of the xylem portion of the fibro-vascular bundles, to which is added in the case of dicotyledons the tissue constituting the medullary rays. The walls of the different kinds of cells found in the wood tend, generally, to become lignified, and their cavities to be filled with air. Thus, the elements found in the xylem have usually lost their protoplasmic contents early. They are four in number :—vessels, tracheids, wood-fibres, and wood-parenchyma. True vessels (*tracheæ, ducts*) are articulated tubes, formed from rows of superimposed cells, the adjoining walls of which have been more or less absorbed, the absorption being partial only when the intervening walls are oblique, but frequently complete when they are horizontal (*sp*, Figs. 14 and 15). The vessels are distinguished as spiral, reticulate, annular, scalariform, or pitted, according to the manner in which their longitudinal walls are thickened. Tracheids (*hydroids*) are closed, much lengthened, narrow prosenchymatous cells, simulating vessels in the nature of the thickening of their walls, which are pitted, and in functionally containing water only, both vessels and tracheids being specially adapted for conducting water. Coniferous wood, as a rule, consists entirely of tracheids (see *Pharm. Journ.*, [3], xxii., 22).

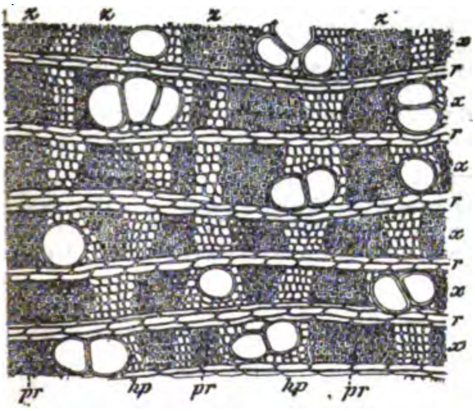

Fig. 13.—Quassia Wood. Transverse section—*hp*, wood-parenchyma, adjoining large vessels; *r*, medullary rays; *pr*, wood fibres. x65. (Berg).

Wood-fibres (*libriform cells*) are also prosenchymatous cells, having thick walls with small slit-like pits (*pr*, Figs. 13 and 14). They resemble bast cells, but are usually shorter than the latter. Constituting part of the mechanically supporting tissue, they also occasionally serve for conducting and storing nutritive material. Wood-parenchyma (*hp*, Figs. 13 and 14) occurs in the secondary wood, and is formed by the repeated transverse division of the cambium cells, the cell walls being thin, and bearing large simple pits. It serves for conducting carbohydrates and storing starch, and the cells frequently still contain protoplasm. Crystals of calcium oxalate are also often found in these cells. (Figs. 16, 18, 19).

Medullary rays appear in transverse sections of dicotyledonous stems as lines between the fibro-vascular bundles, and extend from the centre of the stem to the circumference (*r*, Fig. 13). In radial longitudinal sections they appear as transverse bands of small height (*r*, Fig. 15), and in tangential sections as elliptical groups of cells, consisting of one or more rows surrounded by the elongated elements of the wood (*r*, Fig. 14). The rays consist of parenchymatous cells, much elongated in the radial direction. The cells frequently contain protoplasm, conduct in a radial direction, and are receptacles for the storage of starch and other reserve materials. Secondary medullary rays do not extend to the pith, and are formed at a later stage than the others.

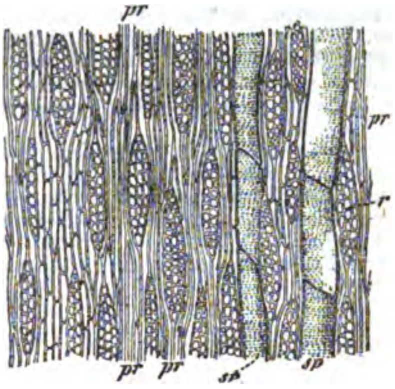

Fig. 14.—Quassia wood. Tangential section—*sp*, vessels; *r*, medullary rays; *pr*, wood-fibres. x65. (Berg).

In many large timber trees there is frequently a striking difference between the older and younger portions of the wood, known as heart-wood (*duramen*) and sap-wood (*alburnum*) respectively. The heart-wood is often darker in colour, always contains less water, and has no starch in its parenchymatous cells.

### *Reactions of Lignin.*

Lignified cell-walls are coloured yellow by zinc chlor-iodide, and dissolve in concentrated sulphuric and chromic acids, but are insoluble in cuprammonia and in Schultze's maceration fluid.

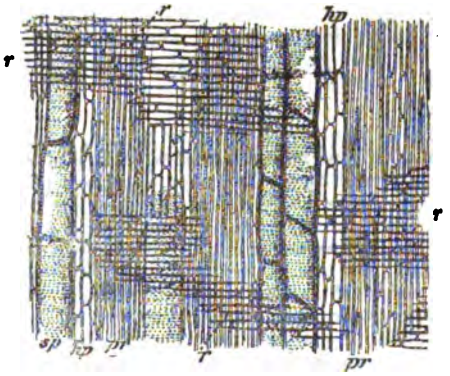

Fig. 15.—Quassia wood. Radial section—*sp*, vessels; *r*, medullary rays; *pr*, wood-fibres; *hp*, wood-parenchyma. x65. (Berg).

The middle lamella, however, dissolves readily in the latter, and the constituent cells of the wood may thus be isolated. The maceration medium consists of nitric acid and crystallised potassium chlorate. The concentrated acid may be used, or two parts diluted with one of water. A small quantity of the salt is added, and the pieces of tissue to be studied should be boiled with this mixture for a few minutes. The isolated cells should afterwards be carefully washed in alcohol and may then be preserved in glycerin. Sulphate of aniline in aqueous solution, with or without dilute sulphuric acid, colours lignified cell-walls a beautiful yellow, and all membranes containing lignin assume an intense rose colour when treated with phloroglucin and hydrochloric acid.

Pure cellulose differs from lignified tissues in being coloured violet by zinc chlor-iodide, blue by iodine and sulphuric acid, and brown to yellowish-brown or yellow by an aqueous or alcoholic solution of iodine. It swells in aqueous potash solution and in mineral acids, the stratification of the cell-wall being frequently rendered more distinct as a result, like that of starch under similar circumstances (see page 602). On heating lignified membranes, however, with alkalies, concentrated nitric acid, or Schultze's maceration fluid, the deposited lignin is removed, and the cellulose remaining then gives the usual reactions with the above reagents.

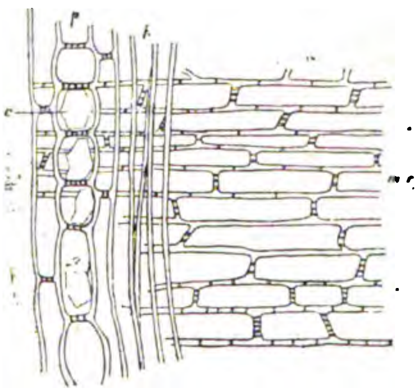

Fig. 16.—Quassia wood. Radial section—*mr*, medullary ray; *f*, wood-fibres; *p*, wood-parenchyma; *c*, crystals. x160. (Greenish).

### *Quassia.*

Quassia wood, from *Picræna excelsa*, consists of pieces of the stem and branches, and is of a very light yellowish tint. Transverse sections (Fig. 13) show numerous fine medullary rays, which are very close, and intersect many obscure and irregular concentrically arranged rings. These apparent rings are not continuous, being formed by bands of wide and unthickened wood-parenchyma running transversely from one medullary ray to another. They differ essentially from annual rings, and the cells contain numerous crystals of calcium oxalate, and occasionally a yellow resin. The pith forms an extremely small cylinder. Radial longitudinal sections have the appearance of being transversely striated by reason of the small vertical height of the medullary rays, which consist of two or three rows of cells (Fig. 14), and are built up of about fifteen layers of cells (Fig. 15). By maceration in Schultze's fluid the individual elements of the wood may be isolated, and quassia will then be seen to consist of vessels, wood-fibres, wood-parenchyma, and the tabular cells of the medullary rays.

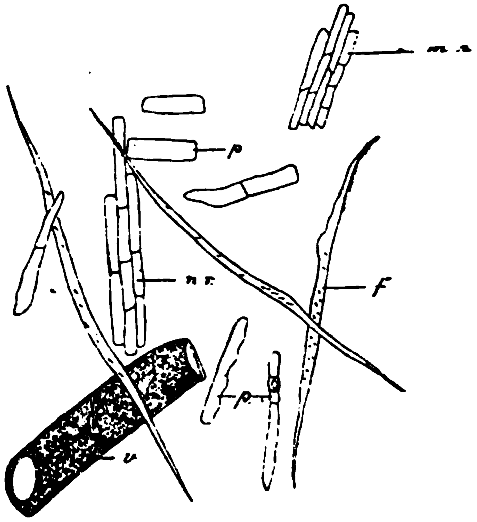

Fig. 17.—Quassia wood. Elements isolated by Schultze's maceration fluid—*mr*, cells of medullary ray; *f*, wood-fibres; *p*, wood-parenchyma, containing crystals; *v*, vessel. x70. (Greenish).

### *Guaiacum.*

The wood of guaiacum, or lignum-vitæ, from *Guaiacum officinale* and *G. sanctum*, is also obtained from the stem and branches. When cut transversely, a stem, seven to eight inches in diameter, exhibits a narrow zone of light yellow sap-wo surrounding the dark greenish-brown heart-wo Apparent rings are formed in both, as in qua by alternate lighter and darker layers, the sap-w also being distinguished by groups of vessels. Th

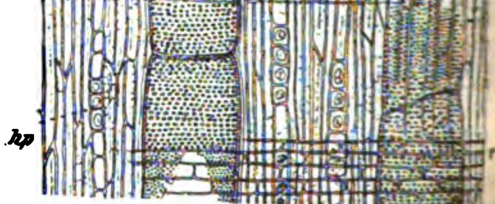

Fig. 18.—Guaiacum wood. Radial section—*sp*, vessels; *r*, medullary rays; *pr*, wood-fibres; *hp*, wood parenchyma, containing crystals. x190. (Berg)

centre is pithless, and the medullary rays are invisible to the naked eye. They are, however, numerous and equidistant. The brownish resin is found in the heart-wood only. A tangential section shows the wood to consist mainly of wood fibres traversed by one-celled rows of medullary rays. There are also thin layers of wood-parenchyma, and a few comparatively large pitted vessels, as is well seen in a radial section (Fig. 18). The sap-wood differs from the heart-wood only in not containing resin. The parenchymatous cells contain crystals of calcium oxalate (*hp*, Fig. 18).

### *Logwood.*

The red heart-wood alone of logwood, *Hæmatoxylon campechianum*, is used. Transverse sections exhibit a series of very narrow and somewhat undulating concentric zones or apparent rings, of similar nature to those in the two previous examples. The medullary rays are also numerous, and have one to three rows of cells, but are not arranged regularly. Few vessels are contained in the bundles, which are transversely united by small bands of wood-parenchyma made up of large, cubic, elongated, or polygonal cells, each containing a crystal of calcium oxalate (*hp*, Fig. 19). The prevailing tissue, however, is densely packed prosenchyma, consisting of wood-fibres (*pr*, Fig. 19) having thick, dark red-brown walls with small pores. The red colouring matter is chiefly contained in the ligneous cell walls, and sometimes occurs in the form of greenish crystals.

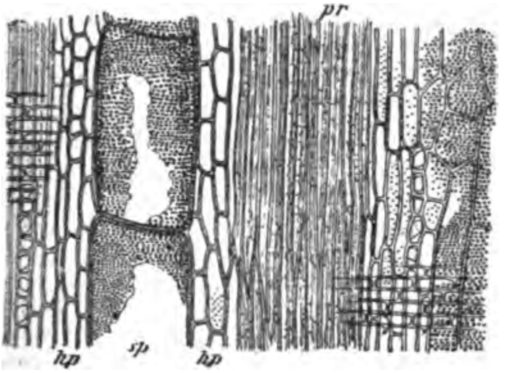

Fig. 19.—Logwood. Radial section.—*sp*, vessels; *r*, medullary rays; *pr*, wood-fibres; *hp*, wood-parenchyma, containing crystals. x190. (Berg.)

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## ELAIOPLASTS.

Herr Zimmermann finds the bodies called by Wakker elaioplasts in a few scattered genera of Monocotyledons, most commonly in the flower- or fruit-stalk. They are usually spherical, though occasionally of some other form, generally only one in each cell; in the living cell they appear to be finely granular. The elaioplast consists of a proteinaceous matrix, with deposits of oily substances. They appear to be normal organs of the cells in which they are found. (*Beiträge zur Morph. und Phys. der Pflanzenzelle*, Heft. 3, pp. 185–197.)

## THE NOMENCLATURE AND FORMULÆ OF CARBON COMPOUNDS.

*(Concluded from page 939.)*

### *Intra-molecular Relations.*

The names given to the parent substances of organic compounds, and the ways in which the names of more complex substances are derived from them having been previously briefly indicated, a little space must be devoted to considering the methods adopted for indicating intra-molecular relations between the constituent parts of a compound; and first, it will be necessary to give some explanation of what is known as isomerism.

When two or more substances are composed of the same elements united in the same proportions, they are said to be isomeric with, or isomerides of, each other. Thus, formic aldehyde, $CH_2O$, methyl formate, $C_2H_4O_2$, acetic acid, $C_2H_4O_2$, and glucose, $C_6H_{12}O_6$, are isomeric, since in 100 parts by weight each contains 40 parts of carbon, 6·66 of hydrogen, and 53·33 of oxygen. Isomeric bodies may either have the same molecular weight, and therefore contain the same number of atoms of each element in the molecule, as methyl formate and acetic acid, or the molecular weight of one will be a multiple of the molecular weight of another, as formic aldehyde and glucose. In the former case they are called metameric, while in the latter the term polymeric is employed.

In the case of metameric substances, there are two cases possible. First, the elements composing the bodies may be combined into quite different groups in the different cases. From what has been said previously, the difference will at once be comprehended between amido-acetic acid $CH_2(NH_2)COOH$, hydroxyacetamide $CH_2(OH)CONH_2$ and nitrite of ethyl, $CH_3CH_2ONO$, all of which are represented by the same empirical formula $C_2H_5NO_2$. In order to distinguish between substances showing metamerism of this kind, the systematic name of the compounds gives sufficient information, as the names of the constituent groups are expressed or implied in such names, as in the examples given.

Second, the same groups or radicals may be present, but these groups will be united together in different ways, or subsidiary groups will be attached to different parts of the molecule, in the different cases. Hydroxypropionic acid may be taken to illustrate this kind of metamerism. The formula of propionic acid is $CH_3CH_2COOH$; if now a hydroxyl group be substituted for a hydrogen atom, the result may be represented by $CH_2(OH)CH_2COOH$, or $CH_3CH(OH)COOH$, which stand for different substances. For metamerides of this class, therefore, it is necessary to adopt some method of indicating the different parts of the molecule to which subsidiary groups are attached.

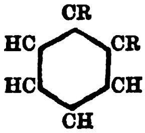
Beginning, then, with the acids derived from the paraffins, which are known as the fatty acids, substituent radicals may be attached to any of the carbon atoms, except that of the carboxyl group; and it is therefore necessary to distinguish these. To do this, they are indicated by the letters of the Greek alphabet, $\alpha$, $\beta$, etc., beginning at the one next to the carboxyl group and proceeding towards the other end of the chain. If, in place of the carboxyl group, there is a carbinol, aldehyde, or other group, these letters are adopted with the same significance; in these cases a substituent might also be attached to the terminal carbon, which is therefore designated as ω; for example—

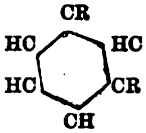
$CH_2(OH)CH_2CH_2COOH$ ...γ-hydroxybutyric acid.
$CH_3CHClCH_2OH$ ............α-chlor-propyl alcohol.
$CH_3CH_2CH(NH_2)OH$ ......ω-amido-propyl alcohol.

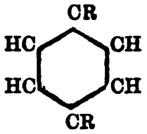
Among di-substitution derivatives of ethylene, when the two substituents are attached to different carbon atoms, the compound is distinguished as α-; when, on the other hand, both substituting groups are joined to the same carbon, the prefix β- is employed; for example:—

α-dibromethylene..............$CH Br : CH Br$.
β-dimethylethylene............$CH_2 : C(CH_3)_2$.

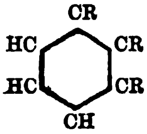
In the case of benzene, if any radical is substituted for one hydrogen atom, only one compound is possible; as all the hydrogen atoms stand in the same relation to the molecule. If, however, two radicals are so introduced, metamerism of a new kind becomes possible, depending on the position of the radicals with regard to each other. In such a case there will be three compounds possible, represented by the formulæ—

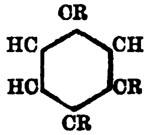


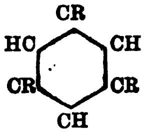




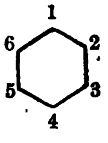
Di-substitution products of the type of the first are called ortho-compounds, those of the second meta-, and those of the third para-; the letters o, m, and p are often employed instead of the particles. In tri-substitution derivatives of benzene, when the three substituting radicals are all similar there will be three possible forms represented by the formulæ—

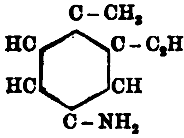






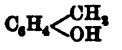
These are sometimes termed respectively ortho-, meta-, and para-, but since these prefixes have been occasionally used with different signification by different chemists, and since when the substituting radicals are all different, the number of possible metamerides is so great that these prefixes are inadequate, it is better to confine their use to di-substitution compounds, and for all others adopt the plan of numbering the carbon atoms of the benzene ring 1 to 6, as shown. The relative position of any substituting radical is then indicated by the number of the carbon atom to which it is attached. For instance, 1-methyl 2-ethyl 4-amido-benzene is the compound represented by the annexed formula. This method is also frequently employed in naming the di-substitution derivatives, the ortho- being called the 1, 2, compound, meta- 1, 3, and para- 1, 4. One of the carbon atoms to which a substituent is attached is, of course, numbered 1, but it is of no consequence which is taken; thus the above compound may also be called 1-amido 3-ethyl 4-methyl-benzene.



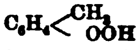


1-methyl 2-ethyl 4-amido-benzene.

In the case of toluene, $C_6H_5 \cdot CH_3$, any new radical entering the compound may either replace a second hydrogen atom of the benzene ring, or one of the hydrogens of the methyl group. In the former case the compounds are at once distinguished by the prefixes o-, m-, or p-; in the latter case by the prefix α-, or by some special name

(A) 

$C_6H_4<\begin{smallmatrix}CH_3\\OH\end{smallmatrix}$

(C) 

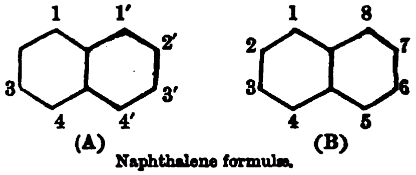
$C_6H_4<\begin{smallmatrix}CH_3\\OOH\end{smallmatrix}$

(B) $C_6H_5CH_2OH$

(D) $C_6H_5CH_2COOH$

which indicates the position. Thus while (A) represents a phenolic body, which is either o-, m-, or p- cresol, (B) is benzyl alcohol; again, (C) is o-, m-, or p-toluic acid, (D) is α-toluic or phenyl-acetic acid.

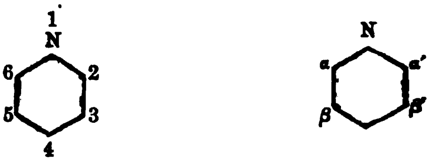
In naphthalene the position of groups in poly-substitution compounds is usually indicated by figures as in diagram (A)—



Naphthalene formulæ.

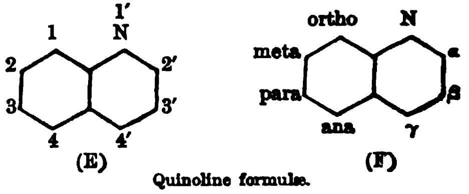
When only one substituent radical is introduced, if it occupies the position 1, 1′, 4, or 4′, each of which stands in the same relation to the molecule, it is distinguished as an α-compound; if it is at 2, 2′, 3, or 3′, as a β-compound. The positions are also sometimes numbered as in diagram (B), but the former method is now generally adopted in this country.

In the case of pyridine, the position of groups in mono- or poly-substitution derivatives is indicated by numbers, as in (C), but Greek letters are sometimes, though less frequently, used, as in (D).



Pyridine formulæ.

In quinoline, the positions are distinguished as at (E), but the method represented at (F) is also often employed.

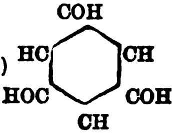


Quinoline formulæ.

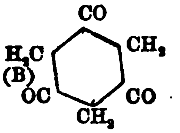
In addition to the above rules, the prefix α- is oft used unsystematically to indicate a particular one o two metameric compounds. This end is also oft attained by means of the prefix iso-, which is generally applied to that one of two compounds which is less important or less common; it is used according to rule in the following cases. The group $-N=O$ attached to a molecule is called the nitroso-group, and $=N-OH$ the iso-nitroso-group. Bodies containing the group $-C\equiv N$ and $O-C\equiv N$ are respectively termed cyanides and cyanates, those containing $-N\equiv C$ and $-N=C=O$ iso-cyanides and iso-cyanates. For pyrazol and its derivatives, see *Pharm. Journ.*, [3], xxii., 892.

There is yet another kind of isomerism about which a few words must be said. In some cases, two bodies occur which contain the same groups of elements, and these groups are united together in the same way; the substances show identically the same behaviour, but differ from one another in their physical action on a ray of polarised light. Such bodies are said to be physically, or optically, isomeric. For a discussion of the theory by which optical isomerism is explained, see *Pharm Journ.*, [3], xxii., 41. Very similar to isomerism is the phenomenon known as tautomerism. Bodies are said to be tautomeric when they exist in two forms. This is illustrated by 1, 3, 5, tri-hydroxybenzene, or phloroglucinol. This substance behaves under some conditions as though it were a trihydroxybenzene, as represented by (A), and under other conditions as a triketone, as indicated by the formula (B). It is supposed to actually exist as a mixture of these two forms, and that any particular molecule is constantly changing from one form to the other. If now a substance is presented to it which will react with it in one form only, the molecules which are in that form will be attacked, and as fast as others assume this form they will also be attacked and so prevented from changing back, until the whole of it has reacted either as a trihydric phenol, or a triketone, as the case may be. A similar explanation is applied to other cases of tautomerism.

(A)

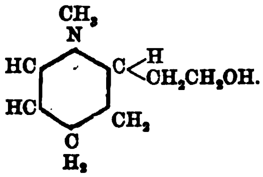


(B)

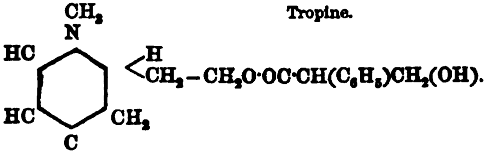


By way of exemplifying the various rules that have now been given, the constitution of one or two bodies, as indicated by their systematic names, may be briefly considered. For instance, atropine is the tropic ester of tropine, that is, it is formed by the combination of tropic acid and tropine, with elimination of water between a carboxyl and an alcohol group. Tropic acid is α-phenyl β-hydroxypropionic acid. We know the constitution of propionic acid to be represented by an open chain formula thus, $CH_3{\cdot}CH_2{\cdot}COOH$: the Greek letters tell us to which carbon atoms the hydroxyl and phenyl groups respectively are attached, so that we can write the formula for tropic acid $CH_2(OH){\cdot}CH(C_6H_5){\cdot}COOH$. Next turning to tropine, its systematic name is α-hydroxyethyl-methyl-tetrahydropyridine. Tetrahydropyridine is pyridine to which four atoms of hydrogen have been added. One atom of hydrogen is replaced by a methyl group, which is attached to the nitrogen, otherwise its position would be indicated by a letter; another hydrogen is replaced by a hydroxyethyl* group, in the α- position.

We can now write the formula for tropine. Combining this formula with that for tropic acid, by combination between the carboxyl and alcohol groups, we have that for atropine.



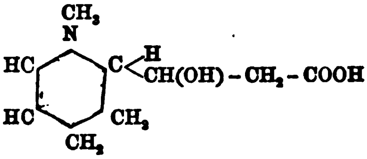
Tropine.



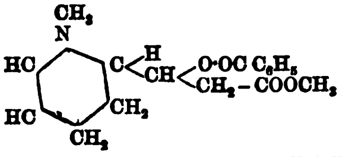
Atropine.

Compounds of tropine with acids, such as atropine, are called tropeïnes.

Taking now another alkaloid, ecgonine is β-hydroxy-β-methyltetrahydropyridyl-propionic acid; its formula is arrived at by inserting in the formula for propionic acid, in the β- position, a hydroxyl group and a pyridyl group, to which four atoms of hydrogen have been added and the one attached to the nitrogen then substituted by methyl; thus:—



It is thus seen to be nearly related to tropine. Since it contains both an alcohol and an acid group, it can unite with both acid and alkyl radicals, and cocaine is the compound so formed by its combination with benzoyl and methyl residues, thus:—



The name phenyl-acetamide is officially given as a synonym for antifebrin or acetanilide. Acetamide is, of course, the amide of acetic acid, $CH_3CONH_2$; and the phenyl derivative of this will be represented by $CH_3CONH(C_6H_5)$, which is the formula for antifebrin. If the phenyl group replaced one of the hydrogens attached to the carbon in the acetamide, the resulting compound, $C_6H_5{\cdot}CH_2{\cdot}CONH_2$, would be α-toluamide, from α-toluic acid, $C_6H_5CH_2COOH$.

Countless other examples might be given, but enough has been said to enable the student, with a little application, to grasp the meaning of chemical names which would otherwise be unintelligible. Many illustrations of the formulæ of new compounds and the names associated with them will be found in *Pharm. Journ.*, "The Month," *passim*.

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* Note, in passing, the difference between the hydroxyethyl group, $-C_2H_4OH$, and the ethoxyl group, $-OC_2H_5$; the former contains an alcoholic hydrogen, the latter does not.

## THE CULTIVATION OF VANILLA IN TAHITI.

The cultivation of vanilla has been carried on in the Island of Tahiti for several years, but is limited to a few districts only, that of Papara supplying more than half of the quantity sent into the market. The native method of culture is, as a rule, simply to plant the cuttings of the vine under the shade of trees, and then to leave them to grow and twine round supports as best they can. Occasionally attention is paid to keep the vines trained round the trees, and to prevent them from attaining a greater height than nine feet, so that during the inoculating season the flowers may be reached without difficulty. Shade, though not dense, is absolutely necessary during the growth of the vanilla vine to ensure a successful crop of beans. About one year from the time of planting the vine commences to flower, and the inoculation, which then takes, place must be carefully attended to; this is generally carried out by women and children, whose light hands are best suited for this delicate operation. In from six to nine months from the time of inoculation the bean will be ripe for picking and curing.

The native method of curing is to keep the beans alternately indoors rolled in cloth and out of doors during the day spread on mats exposed to the sun, for periods of three or four days at a time, until they are dried and ready for the market. The disadvantage, by drying on mats in the open, of having beans frequently wetted and deteriorated in value by sudden showers before there is time to get them under cover, has made itself apparent to many native planters, who now dry their vanilla in boxes with glass covers similar to those used at the Temarua plantation, in the district of Papara, which is under foreign management. In this plantation great attention is paid to trimming the plants and keeping the ground clear from weeds; the vines are trained on well selected supports; and the process of inoculation is invariably carefully attended to.

It may here be remarked that low prices in the market one season may render the native planter so indifferent to his interests that his plantations may be left entirely neglected the following year, the flowers even not being inoculated. These failings naturally tell to the advantage of the Temarua plantation, though from steady and good management its crops invariably command the highest prices in the market. The boxes used for curing the beans are made of hard wood with glass covers, and measure 6′ × 4′ × 2′ in depth. They are usually filled three-quarters full, the beans being placed on a blanket in the bottom of each box, and covered with a double thickness of blanket at the top. The glass lids are then put on, and the boxes exposed to the sun for about fifteen days, when the beans are generally found to be sufficiently sweated to admit of their removal to the drying house. This building is constructed throughout of corrugated iron, and contains three tiers of wire shelves. The beans are laid on the top tier first, then they are moved to the second and third in succession as they gradually dry, and remain on the latter until they are perfectly dry and fit for the market.

The Tahiti vanilla is inferior to that of Mexico, Bourbon, and Mauritius, and this drawback is not improved by the careless manner in which the native, and even the European, dries and ties his bundles of beans for export. The export for the past ten years has gradually increased, the United States being the principal market; small quantities are, however, from time to time sent to France and England. The total quantity of vanilla exported in 1883 from Tahiti amounted to 2726 lbs., valued at £818; in 1890 it amounted to 15,882 lbs., value £3248; and this quantity increased in 1892 to 25,560 lbs., valued at £4418.—*Consular Report*, No. 319.

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## THE FUNDAMENTS OF CHEMICAL THEORY.*

BY J. E. TREVOR.

### *The Development of Science.*

The general course of development of the sciences which deal with natural phenomena follows, in its beginnings, through a descriptive stage. The bare facts, the materials with which a science has to deal, are laboriously collected and, in so far as is possible, they are systematically arranged. Not until this patient collection of empirical facts has gathered together a comparatively extended mass of more or less thoroughly classified material does it become possible, with this material as a basis, to begin a study of the casual relations between the different classes of phenomena coming in question. In entering upon this second stage of development the Descriptive Science becomes a Rational Science, the discovery of facts gives place to the discovery of relations, isolated phenomena appear as parts of the coherent whole, and a completed network of its exact relations makes this science a known thing, brings its phenomena under the absolute control of the all-ruling principles of mathematics. A recognition of the connection between phenomena, and not the observation and description of individual facts, is the final aim of science.

Botany, for example, is in its development just emerging from the descriptive stage. The seeking and classifying of kinds of plants has furnished a broad basis of known fact, and men seek now to know the cause of the flow of sap in trees, to follow the transformations in the growing plant and fruit, to understand the chemistry and the mechanics of plant life. The science of physics has made a considerable progress into the rational stage, its investigations are mainly conducted under the guidance of known relations between the phenomena of heat and work, of work and electricity, of electricity and magnetism, and the like. Its world of phenomena is coming more and more under the unerring control of mathematics. But the most complete, the classical instance of this advanced stage of development is offered by sol astronomy, the relations between its elements bei known with such exactness that the minute details of its stupendous phenomena are foretold by computers with nothing less than an astounding accuracy. The command of man over the phenomena of the heavens is one of the most complete as well as one of the grandest achievements of the human intellect.

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* The introductory portion of a lecture delivered Cornell University. From the *Journal of the Ameri Chemical Society.*

Our science of chemistry is in its nature like these others; its progress has hitherto been in the main that of a descriptive science and a fearful mass of necessary chemical material has been accumulated in the course of it. And now its rapid and brilliant rationalisation is attracting the attention of the scientific world.

The desultory alchemy of the middle ages has become scientific investigation when Priestley and Scheele discovered that there was such a thing as oxygen, and Lavoisier showed that matter is not to be annihilated. From this time the increase in our knowledge of descriptive chemistry has been rapid. Valuable principles of classification were furnished by the atomic hypothesis of Dalton and the molecular hypothesis of Avogadro, both appearing early in the century, and they have been employed in a systematic investigation of the properties and reactions of inorganic compounds, which has ever since been carried forward with vigour, to no slight extent under the brilliant leadership of the Swede, Berzelius. This work has been accompanied in later years by an extended study of the materials of organic chemistry, by a seeking and finding of the wonderfully simple and beautiful relations existing between the different classes of the compounds of carbon. Widespread enthusiasm and devotion in this work was kindled over a half century ago in Germany by Liebig, whose gentle memory comes down to us through the science as a charm and an inspiration. This work has enriched science with a wealth of working material, has chased back into the darkness much of the mystery of ordinary life and, in supplying the most useful of our drugs and dyes, has added greatly to the material wealth of the world.

The experimental development of descriptive chemistry, both inorganic and organic, which has made up the great bulk of chemical investigation during the present century, was necessary work and it has been rich in achievement. Yet in it and through it all there is something lacking, something which must eventually claim the supreme interest. From a descriptive science we must pass to a rational science, from the what of chemical phenomena we must pass to the how and the why. The observation and description of individual facts must make way for a recognition of the connection of phenomena; the primitive interest in the discovery of a new compound must vanish to make way for a greater interest in the discovery of relations, of generalisations.

*The Rationalisation of Chemistry.*

The latest phase of chemical science studies chemical processes as such, strives to rationalise chemistry, aims to make it a science of exact relations between classes of phenomena. And since chemical phenomena involve heat and electricity, density, temperature, and the like, things which are specifically treated in the science of physics, the new trend of chemical work has come to be termed the physical chemistry. It is this to which we are now to turn our attention.

To say that the sciences of physics, of mechanics, and of astronomy are more highly developed, are more completely understood than are their sister sciences, is to say that they have been brought more completely under the control of mathematics. The more complete this rule over their phenomena becomes, the more perfect becomes their development as branches of human knowledge. In this respect, as the highest of them all, stands geometry. For twenty-two centuries now the geometry of Euclid has been the encouragement and guide of that scientific progress which is one thing with the advance of man from a worse to a better state; and it is even unto this day the highest aim of every scientific student to bring his science into such a state of perfection as that which has been attained by geometry. The deepest scientific insight shines through the words of the Pythagoreans, who called mathematics the Purifier of the Reasonable Soul, and it is the desire of each one of us to bring that branch of physical science in which he is more immediately interested into such a state that it too shall be, in a similar sense, a purifier of the reasonable soul.

To develop, now, a scheme which shall place chemistry upon the basis of an exact science we must clearly comprehend with what we are dealing, what the subject matter of our work really is. It may be conclusively shown that the actuality with which we have to do is energy; from a physical point of view the manifestations of energy constitute phenomena. From the laws of energy is derivable a coherent system of natural science, made up entirely of exact relations between the various energy phenomena coming in question. This enables us to construct a wide-reaching and coherent theory of the changes of state, a chemical theory characterised by the stately march and all the relentless rigour of a strictly mathematical science.

And in this matter we must stand for conservatism. We must not countenance the wild hypotheses which have so often disfigured chemistry. Facts are the things with which we must deal, and we must deal with them rigorously. Hypotheses are to be used with the utmost caution and discarded whenever possible. In so doing we shall find that our science will become a purer one, and that we shall be far less likely to fetter and blind ourselves by belief in hypotheses, which in themselves may be attractive, but which are essentially unprovable and, therefore unworthy of belief.

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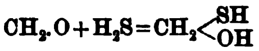
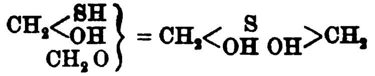
## FORMALIN AS A DEODORISING AGENT.

Schmidt has observed that on adding formalin to putrified meat broth the offensive odour immediately disappears. The same effect is produced on adding formalin to putrid urine. The smell of fæces is also destroyed by formalin. Further inquiry as to the chemical nature of the change thus produced showed that when a solution of sulphuretted hydrogen is shaken with a sufficient quantity of formalin, the odour of the gas disappears and is replaced by a faint alliaceous smell, and it is suggested that the reaction taking place may be represented by the following equation:—



$$CH_2.O + H_2S = CH_2 <^{SH}_{OH}$$

or when there is sufficient excess of formalin to remove the mercaptan smell—



$$\left. \begin{matrix} CH_2 <^{SH}_{OH} \\ CH_2O \end{matrix} \right\} = CH_2 <^{\quad S}_{OH \; OH}> CH_2$$

Methylmercaptan, $CH_3.SH$, which is, according to Nencki, the chief cause of the odour of fæces, is rapidly decomposed by an excess of formalin. Ammonia and ammonia bases are immediately converted into inodorous products. Skatol is not acted upon by formalin unless hydrochloric acid is added, and then it is converted into an odourless product insoluble in water. In this respect synthetic skatol differs from its isomer methylindol, which is immediately acted upon by formalin.—*Pharmaceutische Zeitung*, 39, 56.

## PHARMACEUTICAL CODE OF ETHICS.

### ADOPTED IN 1882 BY THE NORTH CAROLINA PHARMACEUTICAL ASSOCIATION.*

The members of the North Carolina Pharmaceutical Association, considering it necessary that some mutual understanding should exist in regard to the moral principles guiding them in their profession, hereby agree upon the following Code of Ethics:—

1. We accept the U. S. Pharmacopœia as our standard and guide for all officinal preparations, and recognise a variance from its rules only in exceptional cases where sufficient authority has proved some other process more reliable to attain the same end. (This section is not intended to interfere with the dispensing of preparations or medicines ordered in accordance with foreign pharmacopœias).

2. We discountenance all secret formulæ between physician and pharmacist, and consider it our duty to communicate such to each other when requested.

3. We distinctly repudiate the practice of allowing physicians a percentage in any form, on their prescriptions or patronage, as being derogatory to both professions.

4. We will endeavour, as far as possible, to refrain from compromising the professional reputation of any physician, and expect, in return, the same courtesy from him.

5. As the apothecary should be able to distinguish between good and bad drugs, in most cases, and as the substitution of a weak or inert drug for an active one may, negatively, be productive of serious consequences, we hold that the sale of impure drugs or medicines, from motives of competition or desire of gain, when pure articles of the same kind may be obtained, is highly culpable, and that it is the duty of every honest apothecary or druggist to expose all such fraudulent acts as may come to his knowledge.

6. The apothecary should be remunerated by the public for his knowledge and skill, and his charges should be regulated by the time consumed in preparation as well as by the value of the article sold. Although local and other circumstances necessarily affect the rate of charges at different establishments, no apothecary should intentionally undersell his neighbours with a view to their injury.

7. Recognising the value of alcohol as a therapeutic agent, and the propriety of its being dispensed as such by pharmacists, yet deploring the wide-spread evil resulting from its intemperate use in its hundred insidious forms, we condemn any attempt to make it a prominent feature of our business as unprofessional, and we denounce the loose practice of allowing it to be used on the premises in any shape as a beverage as degrading, and we urge upon pharmacists the duty of exercising at all times a conscientious care in dispensing a drug liable to such dangerous abuse.

8. Members of this Association, when asked to do so, shall give each other, confidentially, any information in their possession affecting the character, habits, integrity, or irregularities of any assistant or apprentice who may have applied for employment, or to whom they may have given letters of introduction or recommendation. Any member who shall divulge such confidential communication to the detriment or annoyance of the member giving it shall, upon proof thereof, be no longer entitled to the courtesies due a member, and his name be striken from the roll.

9. Believing that some means should be adopted to enforce the provisions of this Code, violations of the same may be reported at any annual meeting of this Association, when the accused may be heard in his own defence, when, if found guilty, he may be censured, suspended, or expelled by a vote of two-thirds of the members present.

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* From the Proceedings of the Association for 1893.

## CASTOR OIL PRODUCTION IN BRITISH INDIA.

India's backwardness in ability to use her profusion of products to the best industrial advantage is well exemplified in the relative condition of the export trade in castor oil and castor seed. According to *Calcutta Capital* for January 24, the aggregate bulk of last year's shipments of castor oil, viz., 2,578,992 gallons, was practically identical with that of ten years ago, while within the same period the quantity of seed exported has advanced from 222,156 cwts. to 989,534 cwts., the highest record. In the Handbook of Commercial Products devoted to castor oil, the unprogressive nature of the outward trade in this article is accounted for by the fact that the more economical and higher skilled methods of extraction practised in Europe render competition on the part of indigenous manufacturers with their crude appliances and petty establishments, consisting generally at the best of a single or double bullock mill, out of the question, especially as the latter endeavour to supplement their small gains by recourse to adulteration. The history of the jute trade is pointed to as establishing the propriety of this contention; the moral, of course, being that, were European technical knowledge and capital brought to bear on the development of the oil-pressing industry, the same success that has attended the establishment of jute mills in I would in all likelihood be achieved. If the Hindustani castor seed crushers carried on their operations in large factories, there might be some chance of getting the proprietors to see the shortsightedness of the policy of turning out an adulterated article, but under existing conditions the evil must go on until the day shall arrive when it will be judged expedient for the legislature to deal with the question of adulteration generally. For the present the art of sophistication, applied as it is to almost every commodity manufactured in the country, constitutes an industry of no trivial importance in itself, in the means of livelihood it holds out to a not inappreciable section of the community. This, however, setting aside the question of morality, affords small compensation for the retarding influence thus brought to bear on the growth of a large business in native-made Indian oils, or for the depreciated value of, say, cotton and wheat in the European markets.

Although it is probable that the use of castor oil was known, and that the plant was cultivated in India hundreds of years before the Christian era, yet it was from the West and not the East Indies that Europe first derived its supply. On the latter continent the properties of the oil seems to have been known as far back as the thirteenth century, but it was not until about the end of the eighteenth that the first small shipments were obtained from Jamaica, after which supplies from the West were gradually displaced by the production of Hindustan. To comprehend the value of the castor plant, *Ricinus communis*, it is only necessary to look to the number of uses to which it is put. In India the oil is extensively used as an illuminant, and there is none better provided it is "cold drawn," and has been subjected to a proper and carefully conducted method of preparation; moreover, owing to its slow combustion, a saving of ¼ to ⅓ is said to be effected by using it, as compared with other oils. It forms an excellent lubricant, although for this purpose it has been to a great extent superseded by mineral oils. For the dressing of tanned hides and skins it has a high reputation, and the natives employ it largely for preserving water buckets, agricultural appliances, harness, &c., made of leather; and an estimable attribute of the oil, in a climate like that of India, is that it repels rats and other vermin. Country dyers utilise the oil in certain of their processes, as for example in colouring with *Al.*[*] In Assam the plant is widely cultivated as a food for the *eri* silkworm. It has been suggested that where the crop is largely grown in the vicinity of paper mills the stems might be more profitably disposed of for paper-making (an excellent pulp is said to be made from the stems with their bark), than as now used for fuel or for thatching houses. The oil-cake is largely consumed as fuel. It also constitutes a valuable manure; and, although it is considered by European cattle breeders to be highly injurious as a fodder, the same opinion is not by any means prevalent in India. On the contrary, we find that in Mysore a decoction prepared from the cake is given to buffaloes to increase the flow of their milk. In Madras the leaves are given to milch cattle for the same object. Elsewhere, however, we read of the leaves being applied to stop the secretion of milk. This would appear to be a point of considerable importance to clear up, and, as remarked, it might very well form the subject of investigation by the Agricultural Departments in their capacity of consulting chemists and veterinary surgeons. The cake is, or was not long since, used by the East Indian Railway Company, at Allahabad, for gas-making. In Jeypore, the palace, public offices, and streets are lighted by gas produced from a cheap variety of castor oil grown for the purpose. The oil is further said to be capable of forming with copal, dissolved in alcohol, an excellent varnish. The one great thing in which India fails as regards this product is to turn out a good or rather marketable medicinal oil. In this she loses a very large trade; and it is estimated that could such an oil be produced in India and placed in the market, precisely similar to that now imported from Europe, a profit of Rs. 10 per maund would be realised.

As regards the destination of the limited exports of castor oil from India, the greater portion of which is shipped from Bombay, the United Kingdom still heads the list, but the trade has considerably declined during the last ten years. That with Australia, which offers the next important outlet, has fluctuated a good deal during the same period, but in 1892-93 fell below the average. France takes, roughly speaking, about half of the total exports of castor seed; in fact, that country and Belgium together absorb fully fourteen times more Indian oilseeds (excepting linseed) than does Britain, which renders it all the more unsatisfactory that this country should lose the economic and financial gain accruing from the manipulation of so much raw material.—*Board of Trade Journal.*

## THE SYNTHETIC POWERS OF MICRO-ORGANISMS.[*]

BY O. LOEW,

*University of Tokio, Japan.*

Among all living organisms the micro-organisms, micrococci as well as bacteria, bacilli, and spirilli, are especially remarkable for their intensity of chemical activity. Oxidations and decompositions, reductions and synthetical processes are effected on a extensive scale.

If we consider the destructive and the synthetical operations we must arrive at the conclusion that the former are necessary for carrying on the latter. The former yield not only the forces necessary for the synthetical work, but also the suitable atomic groups. It is certainly a highly interesting question of physiological chemistry to study the relations of the two different directions and to elucidate which are the groups that serve for the synthetic work. We must first consider the chemical structure of the compounds that can serve as nutrients, we must investigate the causes that bring about the transformation of potential into actual energy, and we must recognise above all that the proteids of the living protoplasm are chemically distinct from those of the dead. We must acknowledge that when the labile character of the former changes by atomic migration into a stable one the death of the cells has come.

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[*] Morinda root.

[*] Summary in *Chemical News.*

Nutritive and poisonous qualities are relative conceptions. Poisons may become nutrients for bacteria when highly diluted, as phenol or acetic ether, and nutrients may become unfit for nutrition if the concentration reaches certain limits. Small chemical changes may convert a nutrient substance into a poison and, again, the poison into an indifferent substance.

As albuminous matter contains carbon, hydrogen, nitrogen, sulphur, and oxygen, we have to consider principally the question, which substances are suitable sources for the carbon, which for the nitrogen, which for the sulphur. Experiments lead to the following conclusions:—

1. As sources of carbon can be used in neutral or feebly alkaline solutions, alcohols, phenols, organic acids, ketones, aldehydes, carbohydrates, ethers and esters, many alkaloids.

2. As sources of nitrogen can serve: ammonium salts, nitriles, amido-acids, amines, ureas, guanidines, alkaloids, nitrates, and nitrites.

3. As sources of sulphur may serve: sulphates, sulphites, hyposulphites, sulpho-acids, mercaptans, sulphones.

The nucleins, which contain phosphoric acid in their molecule, are here left out of consideration.

The following conclusions are drawn for most of the non-pathogenic microbia:—

1. Hydroxylated acids are better than the corresponding non-hydroxylated ones, *e.g.*, lactic acid is better than propionic acid.

2. Polyvalent alcohols are more favourable for the development than the corresponding monovalent alcohols, *e.g.*, glycerin is better than propylic alcohol.

3. The nutritive quality of the fatty acids and monovalent alcohols decreases with the increase of the number of carbon atoms in their molecules. Thus acetic acid is better than butyric acid.

4. The entrance of aldehyde or ketone groups increases the nutritive properties; glucose is better than mannite.

5. I have observed neither nutritious nor poisonous properties in picro-nitric acid, chloral hydrate, pinakon, ethylendiamine, glyoxal, amido-acetal. Aceto-oxime, diacetonamin, and maleinic acid are very poor nutrients. According to B. Meyer, mesaconic, citraconic, paramethyl-succinic, dimethyl-succinic, and benzoyl-succinic acids are not capable of serving as food.

6. The poisonous properties are determined by the energy with which the unstable atoms of the living protoplasm are attacked.—*Central-Blatt f. Bacteriologie.*

## INDICAN IN PLANTS.

Dr. H. Molisch states that indican is found only in a small number of genera of plants, and these not nearly related to one another. It may be detected by exposing the part of the living plant in which it is contained—usually the root—to the action of alcoholic vapour; the chlorophyll is then extracted by absolute alcohol, and the indican transformed into indigo-blue by the action of concentrated chloral hydrate. Indigo-blue never occurs in the living cell.—*Sitzber. kais. Akad. Wiss. Wien*, June 8, 1893.

## MYROSIN IN PLANTS.

According to Herr W. Spatzier, the presence of this substance in plants is by no means confined to the Cruciferæ; it occurs also in certain genera and species of Resedaceæ, Violaceæ, and Tropæolaceæ. In the Resedaceæ it was found, as in the Cruciferæ, both in the seeds and in the vegetative organs; in the Violaceæ and Tropæolaceæ in the seeds only. In the seeds and vegetative organs of Cruciferæ, and in the seeds of *Tropæolum*, myrosin occurs in special cells, the myrosin-sacs; in the aerial vegetative organs of the Resedaceæ only in the guard-cells of the stomates. When contained in special sacs in the vegetative organs, myrosin is always in a soluble form; while in the seeds it occurs in the shape of granules, which are again converted into the soluble state on germination. The author asserts myrosin to be an enzyme, and a product of the protoplasm. Its formation is not dependent on light. In its physiological functions it appears to stand midway between a product of excretion and a reserve food-material; after having been once formed it is sometimes partially, but never wholly, consumed. Myrosin has the property of splitting up glucosides, the results being potassium myronate and sinalbin. A substance resembling myrosin in its properties was found also in the seeds of the Amygdaleæ.—*Pringsheim's Jahrb. für wiss. Bot.*, xxv., 39-78.

## OPIUM TRADE OF KIUKIANG, CHINA.

The slight falling off from last year in the import of opium is, like that of many of the other imports, to be chiefly attributed to the purchasing power of the population being curtailed by poor crops of tea and general native produce. It by no means follows that Chinese opium is driving the Indian drug out of this market. On the contrary, the import, setting aside 1891, shows a steady increase over that of previous years. The province of Kiangsi would seem to be a large consumer of opium, for, in addition to the import from India, some of which no doubt finds its way farther west, a considerable quantity of the Chinese drug is brought in, both by water and, more largely, over land from Szechuan, without coming under the cognisance of the Foreign Custom-house. A very little is grown locally, and the flavour of it is generally despised. The Ki-Shui district in the Ki-An prefecture to the south-west has a tract of land some eight square miles where the poppy is cultivated to some extent, but the quantity of opium produced does not exceed 90,000 lbs. in a good year. In other parts of the province, agriculturists grow it in small plots sufficient for their own use.—*Consular Report.*

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION

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*SATURDAY, MAY 19, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE SOCIETY'S ANNIVERSARY MEETING.

It may be expected that one of the subjects chiefly engaging the attention of those who attend the annual meeting next week will be the provision of the Pharmacy Acts Amendment Bill, by which it has been proposed to open the way for a considerable accession of members to the Society. The notice of motion given by Mr. Robinson in regard to clause three of the Bill will raise a question that may do away with the non-contentious character which was looked upon as the best reason for believing the Bill might be carried through Parliament without difficulty, and the letters which have appeared in the Journal, especially that from Mr. Warren in the present number, show that there is certain to be considerable opposition to the alteration which is proposed by Mr. Robinson. It would be inappropriate here to enter upon any discussion of the matter as it now stands, but it may be useful to place before our readers a statement of views entertained on both sides. Mr. Robinson's motion, which is the outcome of a discussion on the Bill at a recent meeting of the Western Chemists' Association, proceeds upon the assumption that, in providing for an extension of the privileges of membership in the Society which will be available for all members of the trade, it should be done without any kind of limitation. Hence it is proposed to omit the words limiting the number of members of Council who are not on the register of pharmaceutical chemists. At first sight this proposal appears to be a plausible one, and to be consistent with the object of the Bill to secure more general union throughout the trade. It is argued that if chemists holding the Minor qualification are to be admitted to membership of the Society, instead of being only Associates, in accordance with the existing Act, their position as members should be in every respect the same as that of members at the present time. The point in which the provisions of the Bill fall short of according that equality is in regard to the constitution of the Council, the number of its members who are not pharmaceutical chemists being limited to ten. This is an extension of the limit now obtaining under the Pharmacy Act, 1868, which fixes the number of possible chemist and druggist members of the Council at seven, and it may be regarded in the light of a concession, from the point of view of pharmaceutical chemists, just as the admission of chemist and druggist members to eligibility as members of Council was a concession at the time the Pharmacy Act, 1868, was passed.

Mr. Warren's letter very clearly points to the fact that, except in regard to those who are now Associates of the Society, the proposed Bill is an experiment, the effect of which cannot well be foreseen. That being the case it is essential to conserve the position of pharmaceutical chemists by maintaining the safeguard of a strong pharmaceutical chemist representation on the Council. In support of the policy of such a proceeding he refers to the fact that the majority of the trade are still outside the Society, and are largely influenced by antagonism to it. The gist of his argument, in fact, is that in any attempt to consolidate the trade the Society should be just before it is generous. Past experience of the results arrived at when similar efforts have been made has been of such a nature as to give much force to the suggestion that any fresh attempts in the same direction should be made cautiously, though with liberality. The objection to giving those who have only passed the "Minor," the status of "members of the Pharmaceutical Society," put forward by "M. P. S." in this week's Journal, savours rather of a want of the latter characteristic, and it involves the error of regarding membership of the Society as conferring a title. The only recognised title connected with the calling is that of pharmaceutical chemist, and that is quite independent of membership of the Society. Those who hold that title would not be in any way prejudiced if the privilege of membership of the Society were extended, as is proposed by the Pharmacy Acts Amendment Bill, while the federation of the entire body of registered chemists, thereby rendered possible, might be a means of effecting much good. As Mr. Warren remarks, it is a great measure of reform that is now suggested, and there is ample reason for appealing to the Minor colleagues connected with the Society to accept it without asking pharmaceutical chemist members to forsake the position of trust which they occupy as the successors of Jacob Bell and many other zealous workers for the advancement of pharmacy. With their aid that great measure of reform may be carried through with advantage to themselves, and their co-operation to that end may be the means of bringing about the practical union for which there is so strong a desire and so great a need.

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### THE EDUCATION OF PHARMACISTS.

In the *Apothecary* for April, the Editor, Dr. Oscar Oldberg, who is also Dean of the Illinois College of Pharmacy, contributes a suggestive article entitled "The Only Salvation of the Pharmacist." After referring to the unsatisfactory and unsettled condition of matters pharmaceutical in the United States, he points out that it "is clear that when druggists enter upon a contest for the monopoly of purely commercial business they have absolutely no right or advantage that does not belong equally to other merchants." Druggists who are content to devote their time and energies to purely mercantile competition with other druggists and merchants have no right to complain when their struggles to escape the inevitable consequences are in vain.

Pharmacists, however, who have a higher ambition and possess the requisite education and technical skill, compete for success in life upon an entirely different plane; and Dr. Oldberg is convinced that better education, and earnest efforts to demonstrate the importance and value of the professional services of the pharmacist to the community and the medical profession, "will certainly emancipate pharmacy as a profession from the degrading influence which purely commercial competition must of necessity have, when applied to the business of furnishing medicines to the sick." Physicians and the public, it is suggested, will be certain and glad to avail themselves of the pharmacist's professional services, to such an extent as to make his calling both honourable and sufficiently remunerative; but this will be conditional on the standard of education in pharmacy being such as to command the confidence and respect of intelligent men, whilst it is just as certain that if not sufficiently well educated the pharmacist will not enjoy the respect and confidence which are indispensable to his success as a professional man.

Since the tendency, when all druggists are classed upon the same level, is to keep that level far below what is necessary to warrant the claim of professional education, Dr. Oldberg would have two classes. Members of the first class should be required to have undergone a two years' systematic training, the curriculum of studies and laboratory courses being such as to occupy the students' whole time for eight or nine months in each year. A distinctive title should be conferred upon them, and they should be entitled to practice pharmacy to the fullest extent without restriction, whilst they should also be competent to perform ordinary analyses of water, milk, urine, etc. Pharmacists of the second class would need only to undergo nine months' systematic training, and would also possess a distinctive designation, but would be prohibited from dealing in certain potent and important medicinal substances, the dispensing of which should be restricted to pharmacists of the first class. In the case of either class it is stipulated that two years' shop training should be necessary before registration.

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### THE ANNUAL DINNER AND MEETING.

Members and Associates of the Society are reminded that the Annual Dinner will take place at the Whitehall Rooms, Hôtel Métropole, on Tuesday next, May 22, at 6.45 p.m., the chair being taken on the occasion by the President, Mr. Michael Carteighe, who will be supported by several distinguished guests. The fifty-third Annual General Meeting of the Society will be held at 17, Bloomsbury Square, London, on the following day, Wednesday, May 23, at twelve o'clock noon, to receive the Report of the Council, and elect the Council and Auditors for the ensuing year.

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### GERMAN APOTHEKER VEREIN.

The meeting of this Association will be held this year at Cassel, from August 14 to 17, under the Presidency of Herr Frölich, and in connection with the meeting there will be an exhibition of pharmaceutical objects which is expected to be a special attraction, as the town of Cassel is very conveniently situated for access and the conveyance of goods. Arrangements are now being made for the allotment of space to exhibitors under the direction of a local committee, the chairman of which is Herr W. Nagell, Hofapotheker, Cassel.

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### A DISCLAIMER.

We notice in the City article of Thursday's *Times* a statement that "Mr. W. Martindale has resigned his seat on the board of the Carbolic Smoke Ball Company (Limited)." We are authorised to state that the person there referred to is not the Mr. Martindale who is a member of the Council of the Pharmaceutical Society.

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### PHARMACEUTICAL CODE OF ETHICS.

In view of the recent discussions regarding the desirability of formulating a code of ethics f[illegible] pharmacists, that of the North Carolina Pha[illegible]ceutical Association should possess some inte[illegible] for our readers, and is accordingly reproduce[illegible] page 964, in the present issue of the Journal. S[illegible] this code was adopted twelve years ago and [illegible] continues in force, it may doubtless be [illegible] that it has been found to serve the desired pur[illegible] It should be noted, however, that certain o[illegible] clauses refer to practices which have little i[illegible] existence in this country.

# Transactions of the Pharmaceutical Society of Great Britain.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 9th inst., the Curator presented the following report of donations to the Society's Museums:—

*To the Museum in London.*

**Professor H. G. Greenish, London:**
Specimen of the root of *Asphodelus albus*.

**Mr. J. S. Ward, London:**
Specimen of white Asphodel root.

**Mr. H. N. Ridley, M.A., Singapore:**
Specimens of the leaves of *Leptospermum amboinense*, and of *Beckia frutescens*, and the dried juice of *Strychnos tieute*.

**Mr. Alex. Ridley, London:**
Specimens of miniature Areca plants.

**Mr. F. Coles, London:**
Specimen of titaniferous iron sand.

**Messrs. Warrick Frères, London:**
Specimen of Sandal wood.

**Messrs. T. Christy & Co.:**
Thirty-nine specimens of African drugs.

*To the Herbarium.*

**Mr. H. N. Ridley, M.A., Singapore:**
Twenty-one specimens of medicinal plants from the Straits Settlements.

**Mr. H. Peirson, St. Mary Cray:**
Specimens of *Lathræa squamaria* and of *Paris quadrifolia*.

**Dr. Hugo Finck, Cordova:**
Thirty-eight specimens of Mexican plants.

*To the Museum in Edinburgh.*

**Mr. James Jack, Arbroath:**
Specimen of *Piper longum*.

**Mr. J. S. Ward, London:**
Specimen of white Asphodel root.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

At a meeting held on Thursday, May 3, Mr. E. Brooke, F.C.S., Vice-President, in the chair, the following paper was read:—

### AQUATIC PLANTS.

BY C. E. ASHBY.

Water is a prime necessity to every plant, and the structure of every plant provides for its absorption, transit, consumption, and exit. In land plants water is absorbed by the root-hairs, transmitted through the cell-walls of the wood to the leaves, and there assimilation takes place. But in aquatics the entire surface of the plant can absorb water, there are no root-hairs, and the root appears to have little function beyond holding the plant in its place. This difference between aquatics and terrestrials is seen when one part of an aquatic is kept out of water and the other remains submerged; the former withers and dies, while the part submerged thrives.

Aquatics, like land plants, absorb gases through the epidermal cells, with this difference, that the oxygen and carbon dioxide are absorbed from solution. In the process of assimilation oxygen is given off, and this helps to maintain the supply required by fish The fibro-vascular system of aquatics is not strongly developed. The plant is built up mainly of parenchyma, in which are a large number of intercellular spaces, with walls of simple cellulose not adapted for the transmission of an upward stream of water.

The leaves of submerged plants have fewer functions, and are consequently simpler in structure than those of land plants. The tissue is all parenchymatous, the cells which form the veins being a little longer and rather stouter than the rest. Stomata very rarely occur. In the thicker leaves cavities at regular intervals contain air, and by lessening the specific gravity enable them to float. It is not uncommon to find a water plant bearing two kinds of foliage leaves. For instance, in the water Ranunculus the lower part of the stems produces elegant, finely-cut leaves; but in spring large floating leaves on the upper part bring the flowers to the surface. The flowers of aquatic plants show but few peculiarities of structure. They always open above the surface of the water for pollination. An aquatic habit of life facilitates reproduction by vegetative processes, and puts difficulties in the way of the formation of seeds.

Turning from the general history of water-plants to the peculiarities of individuals, the Oscillarias, well known as green or brown tufts in stagnant water, are among the simplest organisms. They seem to point to the first idea of life. If we examine closely we find each tuft is a mass of filaments, which sway to and fro in the water and, at the same time, travel slowly forwards.

Spirogyra is more highly organised. In this alga is seen the dawn of sexual reproduction. Cells of neighbouring threads coalesce to form spores, which hibernate in the mud at the bottom of the water. In spring they absorb water, burst, and put forth the filaments of a fresh plant.

Diatoms are found gliding about in all waters. A hundred years ago their existence was not known of, but now 1000 British species are distinguished, 4000 more on the Continent, and world-wide investigation brings many more under notice. Moisture and light are essential to their development, as wherever these exist diatoms will almost certainly be found, on moist rocks, on the surface of mud, and on the stems and leaves of water-plants, on seaweeds, in the stomachs of molluscs, etc. The length of those of medium size is about one two-hundredths of an inch, a few are larger, but the majority smaller. These minute plants secrete a case of silica, comparable to a pill box and its lid. As the diatom grows the lid is gradually pushed off, and before separating a new valve is formed in the open half of each side, this process, when often repeated, involving considerable diminution in size. Then the valves fly apart and set free an auxospore of the original size. When they perish the flinty cases fall to the bottom of the water, accumulate, and in course of ages harden into rock. Such a deposit near Richmond, in Virginia, is said to extend for miles, and in places is forty feet thick. The material is used as a polishing powder, as a filtering medium, and as an absorbent for nitroglycerin in the manufacture of dynamite.

Algæ occur in salt water even more abundantly than in fresh. Different flora inhabit different parts of the ocean. The North Sea, Indian Archipelago, the Mediterranean, the Red Sea, and the seas of China and Japan each possess a vegetation peculiar to itself. It would appear that the bottom may in places be, as it were, a vast meadow clothed with vegetation. In the North Sea there is a record of a bed twenty miles long covered with the same species. The gulf weed is usually noticed in crossing the Atlantic. The plants float about unattached, and give the name Sargasso Sea to a large district, around which the currents in the ocean flow. A tree seaweed is mentioned from Patagonia with a stem ten feet high and twelve inches in circumference, its fronds a yard long and three inches broad. Some algæ supply nutritious food. "Dulse and Tangle" was formerly a common cry in the streets of Edinburgh. Irish moss yields a demulcent, nutritive jelly. Ceylon moss, and species found in China and in Chili, are used for soups. Glue is made in China from seaweed. The bladder-wrack is used in medicine, and we depend almost entirely upon seaweeds for our supplies of iodine.

Passing to the fungi we find that, though most species are terrestrial, a vast number of individuals inhabit the water. Water swarms with bacteria and allied forms. Salmon disease is due to a parasitic fungus. The members of this class, consequent upon their thoroughly aquatic habit, produce motile zoospores.

The three groups of vascular cryptogams, ferns, club mosses and horsetails, all contribute to our aquatic flora. The filmy ferns are undoubtedly aquatic, and the Osmunda and marsh fern prefer wet moors. The heterosporous ferns are all aquatic. Salvinia floats on water, and some of its leaves have undergone modification into long filamentous organs, which act as roots. The horsetails are terrestrial, or aquatic, or flourish in either situation. Selaginella and Isöetes are aquatic representatives of the club mosses.

About one-thirteenth of British flowering plants are classed as aquatics, *i.e.*, they grow exclusively where water has stood during the winter. Palustral or bog plants are more numerous, and Littorals, those growing on the sea-shore, form one-fifteenth of the British flora.

Duckweed, the smallest flowering plant, is interesting. A flattened, disc-like stem bears small roots on its under surface, and puts out rudimentary branches at the side. A spadix containing three flowers, two male and one female, rises from the margin; but duckweed is not often found in flower. In autumn the tissue breaks up, and allows water to enter; the plant sinks and decays, leaving one or more buds at the bottom of the pond. In spring these rise to the surface, and growth recommences.

The grasswrack inhabits brackish water, growing in the estuaries of rivers and similar situations. It is sometimes used as packing material in place of straw.

The flowers of *Ruppia maritima* are entirely submerged in the early stage. As they develop, the peduncle elongates and pushes the flower above the surface; after fertilisation the stalk contracts like a corkscrew, and lowers the seed towards the bottom.

Water plantain is regarded by farmers as a somewhat powerful poison to cattle. It has been employed medicinally in cases of paralysis.

In the bladderwort, vesicles containing air cause the plant to float.

Elodea is a North American plant, which bears hermaphrodite flowers. The branches which it throws off, or which become accidentally detached, freely take root, so that the plant has enormous power of increasing. Its introduction into Britain occurred about ten years ago, when a plant was found in the Cam. Now many other rivers and canals are infested with the weed, which causes considerable annoyance to boatmen. All the British plants produce female flowers, and as these alone cannot mature seeds, the rapid increase must be attributed entirely to vegetative multiplication, possibly from the one individual.

In *Vallisneria spiralis* the female flowers are lifted to the surface on a long stalk. The male flowers break loose from their position lower on the plant and float on the surface among the female flowers. After fertilisation, the stalk contracts in a spiral manner and draws the seed under water.

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The paper gave rise to a discussion, in which the Chairman, Secretary, Messrs. Tickle, Garnett, Hill, Henry, Potter, Kitson, Jackson, and Maskew took part.

A "Report on Materia Medica," by Miss Bertha Shove, was, in the absence of the authoress, read by the Secretary. It dealt with the chemistry of various synthetical remedies, such as salol, salophen, betol, alphol, guaiacol carbonate, etc., explaining their constitution and their relations to each other. The report was followed by a discussion, to which the Chairman, Messrs. Garnett, Tickle, T. M. Taylor, Potter, and Hill contributed.

The meeting then adjourned.

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## CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of the council was held at 103, Great Russell Street, on Friday, May 11, when the following officers were elected for the ensuing session:—President, Mr. R. H. Jones; Vice-Presidents, Messrs. H. H. Robins and F. C. Long; Treasurer, Mr. C. J. Strother; Secretaries, Mr. E. H. Gane (Literary), Mr. E. W. Hill (Financial).

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## ROYAL MICROSCOPICAL SOCIETY.

At the meeting held on April 18, Mr. A. D. Michael, F.L.S., President, in the chair, Dr. W. H. Dallinger directed attention to a stereoscopic photomicrograph of Heliopetta, which had been presented to the Society by Dr. W. C. Borden, of New York. Dr. Dallinger also read a short paper from Dr. H. G. Piffard in reference to a method which he had adopted for the examination of some of the old immersion objectives. Mr. J. W. Brown exhibited a "home-made" microscope. Professor F. J. Bell read a letter from Mr. C. J. Pound describing the laboratories of the Stock Institute of Queensland, which had recently been instituted for the purpose of investigating the nature of causes of animal diseases in that colony. Mr. J. G. Grenfell read a paper "On the Tracks, Threads, and Films of Oscillatoriæ and Diatoms," illustrating his subject by diagrams and specimens. Mr. T. Comber and the President made some remarks on Mr. Grenfell's paper.

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# Provincial Transactions.

## NORTH OF ENGLAND INSTITUTE OF TECHNICAL BREWING.

### THE POLARISCOPE IN RELATION TO CHEMICAL CONSTITUTION.*

BY PERCY FRANKLAND, PH.D., B.SC. (LOND.), F.R.S.,

*Professor of Chemistry in University College, Dundee, St. Andrews University.*

In every modern brewery continual use is made an instrument which is capable of revealing one the most remarkable properties possessed by only comparatively small number of substances, viz., power of rotating the plane of polarisation of a of polarised light which is transmitted through The instrument in question is known as the pola or polarimeter, and inasmuch as some of the important substances which display the power rotating the polarised beam are the sugars, it is unfrequently also called the saccharimeter or measurer.

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* Reprinted from the *Chemical News*.

The construction and principles underlying the use of this instrument must be so well known that it is quite unnecessary for me to enter into any description of them, nor into its use in the brewery. On the other hand, I will endeavour to give some account of what has been accurately ascertained concerning those substances which possess the remarkable property of affecting this instrument, and which, on account of their rotating the plane of polarisation, we generally speak of as optically active bodies.

The existence of such active substances possessing the power of rotating the plane of polarisation was discovered by Arago in 1811 on rock crystal, whilst four years later—in 1815—Biot found that certain organic substances were possessed of the same property, and during no less than forty years he laboured in investigating these phenomena of circular and rotatory polarisation, and in ascertaining the laws by which they are governed.

It is, however, with the connection between this property of optical activity and the chemical character of the substances possessing it that we are specially concerned this evening.

The great pioneer in the special study of these active substances from a chemical point of view was Pasteur, and there is nothing more indicative of the marvellous fertility of his genius than the manner in which whatever he has touched has proved to be a solid foundation-stone, on which it has become possible to subsequently erect an edifice of vast and imposing proportions. Thus, in this case, his remarkable prescience led him to see that the study of these optically active substances must ultimately result in the most important revelations concerning the internal arrangement of matter, and by the brilliancy of his initial discoveries in this direction he drew the attention of a number of other chemists to this subject, the investigation of which has been rewarded by some of the most signal and profound advances in chemical science during recent years.

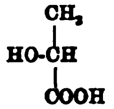
Already, in 1861, more than thirty years ago, Pasteur pointed out that this optical activity was associated in a most remarkable manner with crystalline form, for he observed that those substances which possess this activity exhibit a lack of symmetry in their crystalline structure.

Moreover, in those cases in which a substance was known to exist in two different varieties, the one turning the plane of polarisation to the left, and the other, through the same angle, to the right, he observed that there existed the most extraordinary relationship between the crystals of these two varieties, or optical isomers as we call them.

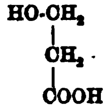
This relationship of form is well exemplified by a diagram of the crystals of dextro- and lævo-ammonium bimalate. On looking carefully at these two forms it will be observed that they are not superposable the one on the other, but, like our two hands, the one is the image of the other as seen in a mirror. To this relationship subsisting between an object and its non-superposable mirror image, those who delight in long words give the name of "enantiomorphism."

Pasteur did not remain satisfied with this superficial observation, but was carried by his imagination to speculate on the internal structure of these bodies exhibiting this remarkable external relationship, and, with that courage which has characterised his career, he at once proclaimed his belief that the constituent atoms of these substances were arranged also in some way or other in a dissymmetric manner, and that the dissymmetry of the lævo-rotary body must be the non-superposable dissymmetry of the dextro-rotary substance as seen in a mirror.

The great source of difficulty which these optically active substances caused chemists was the circumstance that the difference between them could not be represented by the customary formulæ. Thus, to take the simplest case of lactic acid, $C_3H_6O_3$; of this substance we can predict by formulæ the following varieties, or isomers as we call them:—



$$\begin{array}{c}CH_3\\|\\HO\text{-}CH\\|\\COOH\end{array}$$



$$\begin{array}{c}HO\text{-}CH_2\\|\\CH_2\\|\\COOH\end{array}$$

But not only are these two lactic acids known and easily distinguishable, but the first form we know in no less than three modifications, which hardly differ from each other excepting in their action on polarised light; thus one of them has no action on polarised light at all, or is optically inactive, whilst, of the other two, the one turns the plane of polarisation to the right and is called dextro-rotary, and the other turns the plane of polarisation through the same angle to the left, and is therefore called lævo-rotary. It was Wislicenus who first pointed out that these optical differences could not be represented by differences of ordinary formulæ, and that the ordinary formulæ were inadequate for the purpose in consequence of their not representing the disposition of the atoms in space.

A deliberate and bold attempt was now made to represent the arrangement of the atoms in the three dimensions of space by Le Bel in France, and simultaneously but independently by Van 't Hoff in Holland, and the brilliant results which have rapidly followed on the introduction of their hypothesis have rendered their names amongst the most famous in the annals of chemistry.

These chemists assumed that the atom of carbon may be represented by a tetrahedron, the four groups with which it can combine being attached to the four corners of the tetrahedron.

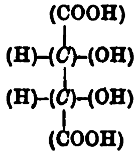
With the assistance of this hypothesis the explanation of the observed phenomenon of isomerism in lactic acid becomes perfectly easy. Thus the two solid formulæ representing the lævo- and dextro-rotary lactic acids are the reverse of each other, whilst the inactive lactic acid consists of equal parts of these two; so that the activity of the one is exactly neutralised by the equal but opposite activity of the other. These two solid formulæ are in precise harmony with the previous speculation of Pasteur, that the dissymmetric arrangement in the two opposite optical isomers is not superposable, but bears the relationship of an object to its image as seen in a glass.

To such a carbon atom, which is capable of having its four attached groups arranged round it in two different ways, Le Bel and Van 't Hoff gave the name of "asymmetric," the one necessary condition for such asymmetry being that all the four attached groups must be different. If two of the groups are identical then the asymmetry ceases.

It is needless to say that a theory so bold and speculative met with the most strenuous opposition, and even ridicule, in many quarters, but so satisfactorily did it explain almost all the cases of optical isomerism which were known at the time that Le Bel and Van 't Hoff did not hesitate to proclaim its perfectly general validity and application.

Thus these chemists predicted that all substances which contain such an asymmetric carbon atom must be capable of existing in two forms differing only in their equal but opposite action on polarised light, whilst conversely that all substances exhibiting optical activity must contain at least one asymmetric carbon atom. It is surely one of the greatest triumphs of chemical philosophy that although this bold generalisation has been before the scientific world since 1874, there has not been found a single fact which is in antagonism to it, whilst, on the other hand, innumerable fresh observations have been made corroborating it, and it has been instrumental in stimulating the most important researches.

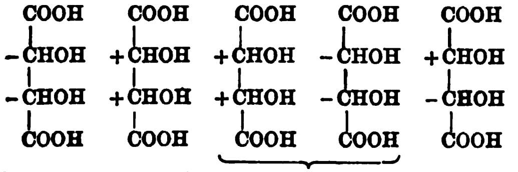
Let us apply this theory of the asymmetric carbon atom to a substance of somewhat greater complexity than lactic acid, viz., tartaric acid. To this body chemists have, on the most overwhelming evidence, assigned the formula—



$$\begin{array}{c}(\mathrm{COOH})\\ | \\ (\mathrm{H})\text{-}(C)\text{-}(\mathrm{OH})\\ | \\ (\mathrm{H})\text{-}(C)\text{-}(\mathrm{OH})\\ | \\ (\mathrm{COOH})\end{array}$$

from which it is apparent that it contains two asymmetric carbon atoms, marked (*C*) in the formula.

The four groups attached to each of these carbon atoms must, therefore, be capable of two different arrangements, and it is obvious that if these arrangements fortify each other we shall have a lævo-rotary tartaric acid on the one hand, and a dextro-rotary tartaric acid on the other, and by mixing equal parts of these optically active acids we shall obviously obtain an inactive tartaric acid. But let us suppose that the arrangement of the four groups around the one carbon atom is opposite to the arrangement of the four groups around the other carbon atom, then the lævo-rotation induced by the presence of the one asymmetric carbon atom will be destroyed by the dextro-rotation of the other asymmetric carbon atom, and we shall again obtain an inactive tartaric acid different, however, from the one we have considered before. Now, as a matter of fact, four different tartaric acids—and only four—are actually known, which we may represent thus:—



$$\begin{array}{ccccc}\mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH}\\ | & | & | & | & | \\ -\mathrm{CHOH} & +\mathrm{CHOH} & +\mathrm{CHOH} & -\mathrm{CHOH} & +\mathrm{CHOH}\\ | & | & | & | & | \\ -\mathrm{CHOH} & +\mathrm{CHOH} & +\mathrm{CHOH} & -\mathrm{CHOH} & -\mathrm{CHOH}\\ | & | & | & | & | \\ \mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH} & \mathrm{COOH}\\ & & \multicolumn{2}{c}{\underbrace{\hphantom{\mathrm{COOH}\qquad\mathrm{COOH}}}} & \end{array}$$

| Lævo-rotary tartaric acid. | Dextro-rotary tartaric acid. | Inactive tartaric acid, commonly known as racemic acid. | Inactive tartaric acid proper. |
|---|---|---|---|

Practically the fundamental difference between racemic and really inactive tartaric acid is that from racemic acid we can obtain by suitable means both the active acids, whilst inactive tartaric acid proper cannot in any way be decomposed so as to yield the active tartaric acids, or, in other words, the inactivity of racemic acid is due to external compensation, the inactivity of inactive tartaric acid proper to internal compensation. A more complete and conspicuous coincidence between theory and practice than is furnished by the case of these four tartaric acids it is difficult to imagine, and necessarily leads us to place a confidence in the theory which further experience has abundantly proved to be well bestowed.

(*To be continued*).

# Scottish Transactions.

## EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

The second annual meeting of this Association was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday evening, 9th inst. Mr. G. H. Laird, President, occupied the chair, and there was a good attendance.

The minutes of last meeting were read and adopted and the Honorary Secretary (Mr. C. F. Hen then read the annual report, which referred to th increase of the membership from 38 to 55; th approach made to the Pharmaceutical Counc with a view to approaching the Board Inland Revenue to get adjusted the grievanc under which chemists suffer in the way th Stamp Acts are administered; the efforts no being made to procure the co-operation of othe societies to attain the end in view; the decision com to by the Association that it was not advisable to agi tate for the abolition of the medicine stamp duty; th extent of the sale of soluble blue containing oxali acid in the city, which was investigated by a special committee; the receipt of £9, balance of funds belonging to the late Chemists and Druggists' Association of Edinburgh, which had been handed over by Mr. J. Laidlaw Ewing, with the consent of his committee; and other matters of minor importance.

The President moved the adoption of the report, and said he trusted that the efforts being made by the Association would lead to a smoother working of the Stamp Acts. Such associations as their own, he thought, would aid the Pharmaceutical Society in many ways. The Council would be enabled to gauge the opinion of the trade throughout the country much better than hitherto. He strongly supported Mr. Hampson's motion in regard to the administration of the Benevolent Fund. He did not suppose they cared very much about the voting. They could not judge properly between the candidates, and this matter, he thought, would be far better in the hands of a committee. He hoped all outsiders would j the Society. It was a hopeless dream, he feared, t think that they could be represented in Parliam but a united society might do much to influ members to get grievances redressed and necess legislature carried out. Mr. Bowman seconded, a the report was adopted.

The Treasurer then submitted the annual financi statement, which showed a balance of £11 7s. in th Association's favour. Mr. Duncan McGlashan w duly elected a member of the Association.

The Picnic Committee having reported that t places were in favour as the rendezvous—Tillietu and Norham Castle—it was unanimously agreed picnic at the latter on Wednesday, June 13.

Mr. J. A. Forret then moved, "That the Asso tion approves of the draft Pharmacy Acts Amend Bill, 1894." He said that this was a very si Bill, to which he did not think any objection c be taken, and he thought that they should encou the Council to proceed with it by passing the moti Mr. Boa, in seconding, mentioned that under present state of things the worthy chairman of North British Branch Executive was not eli for a seat on the Council. Th motion, after short discussion, was unanimously agreed to.

After the Secretary had moved an alteration in rules, providing for the nomination and electi new members at any meeting of the Associ Messrs. Stewart, Lynedoch Place, Edinburgh, McLagan, Grangemouth, were nominated members.

The election of office-bearers was next proc with, when Mr. Peter Boa was elected Presi Mr. Bowman, Vice-President; Mr. Claude F. H Secretary and Treasurer; and Messrs. Aitkin, Glass, R. L. Hendry, Laird, Leask, Lunan, McD McLaren, McPherson, Smith, and Wylie of committee.

A cordial vote of thanks was awarded to Mr. Laird for his services to the Association as p during the last two sessions.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Judgment in the Exeter Case.

At the Exeter County Court, on Tuesday, before his onour Judge Edge, the case of the Pharmaceutical ociety *v.* C. Hornsey, 117a, Cowick Street, St. homas, Exeter, watchmaker, was again mentioned. he plaintiffs sought to recover two penalties of £5 ch, alleged to have been incurred by the defendant December 23, 1893, and on January 5, 1894, spectively, in keeping an open shop for retailing, spensing or compounding a poison, to wit, "corrove sublimate," a poison in the schedule of the harmacy Act, 1868, contained in and forming part the ingredients in a compound called "Hornsey's evonshire specific," contrary to the provisions of the id Statute (31 and 32 Vic. cap. 121). His Honour, will be remembered, delivered judgment at the April urt (see page 868), and in doing so said the expres- on "open shop" seemed to his mind to imply blicity—notice to the public that the particular siness was being carried on, and an invitation to em to take part in it. Therefore, that it was not fficient in this case to show that the defendant tailed poison in a watchmaker's shop. He was lly aware that what the defendant did was quite as ischievous, if not more so, than if he had kept an en shop for the purpose of selling his specific. No plication was made to him to amend the plaint, d the action failed upon what was practically an ror of procedure. The case, however, was adjourned o *formâ* until the May court, to enable the parties consider a suggestion by his Honour that he should mend the plaint by charging a sale on January 5, to hich the defendant should plead guilty, but the dge pointed out that in the event of his sug- stion not being adopted, judgment would be tered for the defendant, with costs, with a ay of execution for twenty-one days to enable the aintiff Society to appeal if so advised. On Tuesday, r. Flux (Messrs. Flux, Son and Co., of London) peared for the plaintiffs, and Mr. A. E. Dunn (of xeter) for the defendant.

Mr. Flux, in answer to the Registrar, said he had application to make, but was merely present out respect to the court. He understood that the se had been adjourned, and was to be called upon -day.

His Honour: It was merely to be called upon *pro rmâ*, so that direct judgment may be entered.

Mr. Dunn: I have been served with notice of peal. Therefore I have nothing to say with regard the suggestion you made at the last court.

His Honour: Yes; I have signed a copy of my tes for the use of the court above.

Mr. Flux: My firm considered it a necessity that e appeal should be entered within twenty-one days m the delivery of judgment, or else we should have ited until to-day.

His Honour: But I adjourned the case *pro formâ* til to-day for the purpose of enabling you to con- ler the suggestion thrown out. I directed that dgment should not be entered until to-day.

Mr. Flux pointed out that the appeal had been tered under advice. It was a public matter, not a re——

His Honour: We may differ in opinion in that pect, because it seems to me it is an appeal upon error of procedure. I said that if the plaintiff ciety thought they ought to appeal, I would give them leave to do so. It appears to me such appeals decide nothing, as I have already pointed out in my judgment that, if proceedings had been taken for the sale, then, in my opinion, there could have been no answer. However, with that I have nothing to do. I have delivered my judgment to the best of my ability, and I have done with it. The defendant is a poor old man about seventy years of age, and I do not know what public benefit will be derived from punishing him. It is, however, a matter for the officers of the Society.

Mr. Flux assured his Honour that there was no desire on the part of the Society to unduly oppress the defendant.

Mr. Dunn said they had no other course when he was served with a notice of appeal, as it threw the suggestion on one side. His Honour would quite understand that he did not wish it remarked in the court above that he had said nothing about the form of the notice he had been served with. He had taken the notice of appeal for what it was worth.

His Honour: I directed judgment to be entered to-day. At the last court I delivered a judgment which, for the time being, was an opinion only, and I adjourned the case until to-day for the purpose of enabling the parties to consider the suggestion I threw out. The Society did not fall in with that suggestion, and all I can do is to direct judgment to be entered to-day.

Judgment was accordingly entered for the defendant, with costs.

## POISONING CASES AND INQUESTS.

### Accidental Poisoning by Carbolic Acid.

Mr. Smelt, deputy city coroner, held an inquest, on May 14, touching the death of Mary Langton, aged 71, late of Churnet Street, Harpurhey, Manchester, at the Workhouse Infirmary. Rose Sorton, a nurse in the infirmary, said that on Thursday she was about to wash the head of the deceased, and put a cup containing carbolic acid and turpentine on the locker by the side of the bed, while she went for a towel. She returned immediately, and Mrs. Langton then said, "Have I taken enough do you think, and will it do me any harm?" Witness could smell the turpentine in the old woman's breath. She told the charge nurse. The doctor was fetched, and he used the stomach pump, but the deceased became unconscious, and the following morning she died. Witness had washed the patient's head with the same kind of mixture before, and told her on Thursday that she was going to wash it then. The jury found that the deceased had been accidentally poisoned by drinking the contents of the cup through mistake.—*Manchester Courier.*

### Death from an Overdose of Laudanum.

On May 9, the Grantham district coroner, Mr. G. W. G. Beaumont, held an inquest at the Bell Inn, Swarby, touching the death of Jane Weston, widow, aged 72, who died on the previous night from an overdose of laudanum. William Weston, son of deceased, stated that his mother had been accustomed to taking tincture of rhubarb, and also kept a little laudanum in the house, but for no specific purpose. Lucy Thorpe, living next door to deceased, stated that deceased came into her house on Monday morning, and said she had taken a dose of laudanum instead of tincture of rhubarb. Witness did not believe deceased took the laudanum intentionally. Dr. Jacobson, of Sleaford, stated that he was called to deceased, and applied the stomach pump, and washed out the stomach, but without avail. Witness thought deceased had swallowed about an ounce of laudanum, and that would contain about thirty-three grains of opium. Four or five grains of opium would in an ordinary case be a fatal dose. The jury returned a verdict of "Death from misadventure."—*Nottingham Daily Express.*

### ACCIDENTAL POISONING BY CARBOLIC ACID.

On Wednesday, May 9, the death of a child, named Isaac Abraham, occurred at the Lancaster Clinical Hospital, in consequence of drinking carbolic acid. Mrs. Abraham, with her son, the deceased, who was two years and eleven months old, visited her mother's residence at 17, Lord Street, Red Bank, on the Tuesday afternoon, and the child, along with another, went upstairs to play. A short time afterwards the child was heard to cry, and it was found that he had drunk some carbolic acid which was in a bottle in the firegrate. He was taken to Dr. Tytler, Cheetham Hill Road, who used the stomach pump, and subsequently to the Clinical Hospital, where he died as stated.—*Middleton Guardian.*

## Reviews and Notices of Books.

THE NATURAL HISTORY OF PLANTS. By ANTON KERNER VON MARILAUN. Translated by F. W. OLIVER, M.A., D.Sc. Part I. Pp. 112, with numerous woodcuts and two coloured plates. 2*s.* 6*d.* net. (Blackie and Son).

The work of which this is the first instalment is a translation of Professor Kerner's *Pflanzenleben*, which is probably one of the best popular accounts of the vegetable kingdom. It appeals especially to general readers, and has, since its publication in the original German seven years ago, met with a deservedly large measure of success. The introduction to the subject matter, on the study of plants in ancient and in modern times, deals with plants considered from the point of view of utility, and with the development of ideas regarding their description and classification. The doctrine of metamorphosis and speculations of nature-philosophy are also considered, the scientific method of study is shown to be based on the history of plant development, and the objects of botanical research at the present day are briefly defined. In the opening chapter the living principle in plants is treated of, protoplasts are considered as the seat of life, and the discovery of the cell and of protoplasm are described in detail. The movements of protoplasts are next described, and the following section treats of their secretions—cell-sap, cell-nucleus, chlorophyll bodies, starch crystals—and constructive activity. Under the heading "Communication of protoplasts with one another and with the outer world," the transmission of stimuli, the specific constitution of protoplasm, vital force, instinct, and sensation are discussed. The latter half of this part of the work is occupied by the first portion of an exceedingly interesting chapter on the absorption of nutriment by plants. Commencing with a classification of plants based on nutrition, the author proceeds to describe the theory of food-absorption, then considers in turn the absorption of gases and salts by different groups of plants—water-plants, lithophytes, and land-plants, the absorption of organic matter from decaying plants and animals by saprophytes also receiving full attention. It will thus be seen that the complete work, which is to be issued in sixteen parts, will deal with the natural history of plants in a very comprehensive fashion. At the same time the reproach that botany is a dull science is shown to be thoroughly unfounded, the chapters being bright and interesting, from the point of view of non-technical readers, from beginning to end. The woodcuts, of which there will be about one thousand in all, are remarkably good, and well adapted to elucidate the descriptions in the text; whilst the coloured plates, of which sixteen are promised, are excellent. The two included in the first part illustrate swarmspores and zygospores, and the *Cereus nycticalus* respectively. In conclusion, it remains only to say that the work of both author and translator is all that could be desired, scientific accuracy being maintained throughout, without in any degree detracting from the entertaining and instructive character of the subject-matter. Everyone interested in botanical science will profit by a perusal of the book, and will doubtless hope that the enterprise of the translator and publishers may meet with a fitting reward.

## Obituary.

Notice has been received of the death of the following:—

On April 27, Frederic Thompson, Chemist and Druggist, of High Barnet. (Aged 33).

On May 4, Alban E. Lomax, Pharmaceutical Chemist, of Liverpool. (Aged 35).

On May 8, Arthur Johnson, Chemist an Druggist, of Liverpool. (Aged 53).

On May 11, John W. Crawley, Chemist and Druggist, of Bow. (Aged 56).

On May 12, Thomas Ashworth, Chemist and Druggist, of Burnley. (Aged 88).

On May 14, Thomas Barraclough, Chemist and Druggist, of Leeds. (Aged 68).

## Correspondence.

### THE PHARMACY ACTS AMENDMENT BILL.

Sir,—A very important proposition is to be discussed at our annual meeting next week, and I thought the present an opportune moment to suggest a few reflections upon it. I would first like to express sincere gratification that the Society is going to Parliament to obtain for chemists and druggists the removal of an evident injustice. It is great and manifestly necessary a reform that we may be content to devote a Bill to it. I would further say I am convinced there are few pharmaceutical who will not be glad to welcome their Minor brother members of the Society. My experience to believe that pharmaceutical chemists would co-operate with chemist and druggist members to for them the yet further privilege which the tical chemist at present enjoys, namely, exemption service. I say thus much to divest of any appearance of partisanship the opposition which I feel to the proposal of Mr. Robinson. In fact, I would like now to speak only as a member of the Pharmaceutical Society to the some four thousand members and associates in business now within the pale of the Society. Frankly, I think that if this number included all who are practising pharmacy in Great Britain, we could throw open the Council to both grades in the Society gladly and freely. But we know that from some cause or other the majority are outside the Society; we know that there still exists a great deal of ignorant prejudice against the Society, and it is just possible if, through sentimental generosity, we abolish the safeguard of a strong pharmaceutical chemist representation on the Council, we may give those who are at present outside opportunity to come in bodily and capture the Society for themselves; for they would then have the power to do so. There are plenty of monied companies and other influences at work which might be glad to assist in the degradation of the Council, and this large unknown quantity outside would certainly have it in its power to return whom it would, and perhaps exclude loyal chemists and druggists and pharmaceutical chemists alike. As a member, and also as a chemist and druggist (for I hold the Minor certificate), I think we ought to hold a definite number of pharmaceutical chemists on the Council assured, not because the chemist and druggist is a less welcome member, but because in the pharmaceutical chemist only is the safety of the Society secured. There are few disaffected pharmaceutical chemists, but unfortunately a large majority of chemists and druggists appear to be either indifferent or antagonistic to the Society. We may reasonably hope in a few years' time that the good work done by the Society will make itself felt, and the majority may be brought within its pale. If the feeling indicated in Mr. Robinson's motion should then strongly exist it might be more safely met. I cannot conceive that any Minor member who has a regard for the Society should feel it a slight upon himself that during the time of change through which we are passing its interests should be safeguarded by the selection of a majority of the Council from a body of men all of whom have worked loyally and strenuously for the elevation and protection of pharmacy. The desire for peace and union is so strong that there is the danger of the present proposition being accepted without due regard being paid to the possible consequences. May we not appeal to our Minor colleagues to accept the great measure of reform now suggested, and not to ask the pharmaceutical chemist to forsake the position of trust bequeathed him by Jacob Bell and so many patient and zealous workers that have followed him, at all events until the majority of those practising pharmacy are zealously attached to our great Society.

WM. WARREN.

*24, Russell Street, Covent Garden, W.C.*

Sir,—The Pharmacy Act Amendment Bill, clause 3, about to be introduced into Parliament, is most unfair to "Major" men if "Minor" men are to have the same privilege of styling themselves "members of the Pharmaceutical Society." The best way, in my opinion, would be to grant a title of "Fellow of the Pharmaceutical Society" on passing the higher examination, and have common fairness all round, instead of giving extra titles after passing the two lower examinations, totally ignoring the rights of the highest qualification. This should be insisted upon by all pharmaceutical chemists just at the present time, and they should not remain quiet when what they have worked hard for and spent time and money upon is given to those who have never done the same, or I am certain, that instead of stimulating one to higher studies it will act in the opposite manner, there being nothing to enter the examination for, and the only difference an empty sounding name not understood and rarely pronounced by the general public.

*Halifax.* "ANOTHER MAJOR MAN."

Sir,—I certainly do not approve of the intention of the new Pharmacy Bill to give the full membership to those who have only passed the "Minor," the status of "members of the Pharmaceutical Society." The members by examination have earned the honorary title by extra study, expense, and anxiety, and I consider the title ought to be enjoyed exclusively by those who have earned it. I would not go so far as to exclude Minor men from taking their place on the Council if so elected, but I should certainly object to their holding the title of M.P.S. when they have done nothing to gain it. I for one should not vote for them.

M. P. S.

### ATROPINE AND ATROPINE SULPHATE, U.S.P.

Sir,—Atropine is described in the United States Pharmacopœia, 1890, thus:—"As it occurs in commerce, it is always accompanied by a small proportion of hyoscyamine extracted along with it, from which it cannot be readily separated." This definition, however, is inaccurate, inasmuch as it has been shown that the alkaloid exists almost entirely as hyoscyamine in the plant, neither is this description in accord with the physical and chemical properties as stated in that work. The melting point of pure atropine, as recorded by Schmidt, is 115°-115°·5 C., whilst that of pure hyoscyamine as recorded by Hesse is 108°·5. The U.S.P., however, states "at about 108° C. it melts, forming a colourless liquid," thus practically admitting a preparation consisting almost entirely of hyoscyamine rather than "a small proportion." Moreover, the U.S.P. requires the "absence of more than a small proportion of hyoscyamine" when describing the formation of a gold salt, the reaction given being characteristic of pure atropine alone. Again, atropine sulphate is described in the same work as melting at 187° C. The melting point of atropine sulphate given by the Pharm. Germ., iii., is about 183°·0 C., the requirement being that it shall be prepared from a pure base melting at 115°·5. The melting point of sulphate of hyoscyamine recorded by Hesse is 201°, and the presence of a small proportion of this salt in atropine sulphate raises the melting point several degrees. I find that atropine sulphate melting at 184° to 185° C. yields, by liberation of the base with ammonia, a pure atropine which readily crystallises and melts at 115°·5 C. It would seem, therefore, that the wording of the U.S.P. description of atropine should be modified so as to show that the hyoscyamine present is in all probability a small proportion unconverted into atropine during the process of extraction, and if it be decided to permit the use of atropine containing a "small proportion" of hyoscyamine, then the melting point and gold chloride tests should be modified accordingly, instead of representing in the one instance a preparation consisting almost entirely of hyoscyamine, and in the other case an almost absolutely pure atropine. These amendments would secure chemical accuracy, which is desirable, notwithstanding the physiological differences between the two bases in question may be regarded as slight.

*Southwark Street, S.E.* JOHN C. UMNEY.

### MEDICAL TREATMENT BY CHEMISTS.

Sir,—I see from your note on page 944, that the evergreen grievance—the prescribing chemist—has, in the *British Medical Journal*, once more been pilloried. I agree that "there should not be any difficulty . . . if due consideration is given to the relations which ought to exist between chemists and medical practitioners," but how can the latter expect a self-denying ordinance from the former while they themselves usurp our proper functions by dispensing (save the mark! can the guesswork that so often goes on in a surgery be worthy such a description) their own prescriptions. Let me give an illustration. In the little town I write from there are nearly half a score of doctors, all supplying their patients with medicine, also the majority, if not all, almost forcing on their patients enemas, trusses, elastic goods, etc., not at chemists' prices though, while the poor chemist is reprobated for mixing a simple remedy for a simple ailment, and extorting an exorbitant charge of one shilling.

AN OFFENDER.

### TINCTURE OF DIGITALIS AND THE OFFICIAL SUCCI.

Sir,—Suggestions from pharmacists for the forthcoming new edition of the Pharmacopœia having been invited, I should like to mention one or two that have occurred to me. First, as to tincture of digitalis, I should propose that this tincture be made from fresh leaves instead of dried, as at present. In the case of belladonna and of hyoscyamus there may be good reasons for using dried leaves, as fresh are not very easily obtainable, but with digitalis the case is quite different, as the plant is particularly abundant in most parts of the country, and pharmacists would have no difficulty whatever in procuring as much as they required in due season. Of course, there may be occult reasons for preferring the dried leaves that are not apparent to me; if so, I shall be glad to hear them. The only argument in their favour that I know of is the fact that a tincture may be prepared from them at any time—an argument that could scarcely be seriously maintained if efficiency is in question. And when we consider the delicate nature of the active principles, and their liability to injury by fermentation or over-heating, I think it will be admitted that the use of dried leaves when fresh ones are readily available is decidedly a mistake. Besides, how can anyone judge whether leaves obtained from the wholesale houses are "collected from wild British plants of the second year's growth when about two-thirds of the flowers are expanded, and carefully dried?" I strongly suspect that a large proportion of them ought to bear the familiar legend "made in Germany." I should propose a tincture containing ten per cent. of dry substance (estimating the moisture in the leaves, and adding q.s. of s. v. r.). Supposing the moisture to be 84 per cent., such a menstruum would have a sp. gr. of about ·940, which, as shown by Wright and Farr (*P. J.*, xxi., 340), is a suitable strength for the extraction of the drug. In conclusion, I should like to say a word as to the "succi," which, so far as my experience goes, have never gained the confidence of the medical profession. In my opinion they should be replaced by fresh tinctures prepared as above, or in the same manner as the *alcoolatures* of the French codex.

*Aberdeen.* R. M. SHEPHERD.

## Answers to Correspondents.

*Junior.*—Edmond's "Elementary Botany" (Longmans, 2*s.* 6*d.*), and Jago's "Inorganic Chemistry" (Longmans, 2*s.* 6*d.*).

## Books, etc., received.

DOMESTIC HYGIENE. By THOMAS DUTTON, M.D. Pp. i.-x., 1 to 199. 2*s.* London: Henry Kimpton, and Hirschfeld Bros. From the Publishers.

DEFECTIVE ARTICULATION RESULTING FROM CLEFT PALATE. By WILLIAM VAN PRAAGH. Pp. 6. Reprinted from the Transactions of the Odontological Society of Great Britain. Second Edition. 1*s.* London: Kegan Paul, Trench, Trübner and Co. From the Publishers.

MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS—INORGANIC SUBSTANCES. By CHARLES D. F. PHILLIPS, M.D., LL.D., F.R.S. (Edin.). Pp. i.-xiv., 1 to 898. 21*s.* London: J. and A. Churchill. From the Publishers.

REPORT OF THE PHARMACY BOARD OF VICTORIA FOR THE YEAR 1893. Pp. 7. Melbourne: H. Hearne and Co. From the Secretary.

PRACTICAL HISTOLOGICAL BOTANY. By FREDERICK DAVIS, B.Sc. Pp. 66, with illustrations. 2*s.* net. London: John Gower. From the Publisher.

## Diary of the Week.

### MONDAY, MAY 21.

*Society of Chemical Industry (London Section)*, at 8 p.m.
"A Bye-Product obtained in Liquidating Copper with Lead," by W. Gowland.
"The Manufacture of Smokeless Powder," by Oscar Guttmann.

### TUESDAY, MAY 22.

*Pharmaceutical Society of Great Britain*, at 6.45 p.m.
Annual Dinner at the Hôtel Métropole.
*Royal Institution of Great Britain*, at 3 p.m.
"The Modern Microscope," by W. H. Dallinger.
*Photographic Society of Great Britain*, at 8 p.m.
"Tone Etching on Copper Demonstration," by H. Calmels.

### WEDNESDAY, MAY 23.

*Pharmaceutical Society of Great Britain*, at 11 p.m.
Meeting of the Council.
*Pharmaceutical Society of Great Britain, at* 12 noon.
Annual Meeting and Election of Council.

### THURSDAY, MAY 24.

*Royal Institution of Great Britain*, at 3 p.m.
"Egyptian Decorative Art," by W. M. Flinders Petrie.

### FRIDAY, MAY 25.

*Royal Society*, at 4.30 p.m.
Ordinary Meeting.
*Institute of Chemistry*, at 7 p.m.
Annual Dinner at St. James's Hall.
*Royal Institution of Great Britain*, at 9 p.m.
"The Development of the Astronomical Telescope," by Sir Howard Grubb.

### SATURDAY, MAY 26.

*Royal Institution of Great Britain*, at 3 p.m.
"The Stage and Society," by R. W. Lowe.
*School of Pharmacy Students' Association.*
Botanical Excursion to Wanstead (for Epping Forest).
Leave Liverpool Street Station at 2.35 p.m.
*Pharmaceutical Cricket Club* v. *Wanstead Colts*, at Wanstead, at 3. p.m.

## Notices to Contributors.

⁂ *Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.*

*All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names only commenced with capital letters.*

*When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines, must be supplied not later than a week before the proposed date of publication.*

*Communications should reach the Editorial Department before noon on Wednesday, if publication is desired in the next issue of the Journal; though this cannot always be guaranteed.*

COMMUNICATIONS, LETTERS, etc., received from Messrs. Johnson, Lowther, Martin, Remington.

## PIPTOCALYX MOOREI, OLIV.

BY E. M. HOLMES, F.L.S.,

*Curator of the Museum of the Pharmaceutical Society.*

A few weeks since I received some leaves from Belgium, with the inquiry if I could identify them. Subsequently I received another similar sample from a London firm, with the statement that they had been imported into Hamburg from Australia, and were offered as a material for use in brewing. A third sample which I had the opportunity of seeing was received from a firm in this country, under circumstances indicating the probability that these leaves had reached this country and were on their trial for the purpose indicated. Under these circumstances it seemed desirable to ascertain if possible whether the plant yielding them was likely to be poisonous or not.

The leaves are lanceolate acuminate, with an obtuse apex about 7 c.m. long by 3 c.m. broad, of a thin, but tough and parchment-like consistence, somewhat shining on both sides, and with the veins and even the veinlets extremely prominent on both sides. A very marked character in the leaf is that the margin, which is entire, is thickened by the veinlets running along it, so as to form a kind of double margin. The midrib and principal lateral veins on the under surface of the leaf are furnished with reddish-brown simple hairs. On holding the leaf up to the light it is seen to be studded with numerous translucent dots, variable in size, but all comparatively small. These do not appear to be oil receptacles, since the leaf has no aromatic taste. It is, however, intensely bitter. By these characters the leaf may be easily recognised.

The leaves possess considerable interest from a botanical point of view. On examining a piece of the climbing stem to which they were attached, it was found that they were alternate, and a portion of the inflorescence showed that the terminal flower in the raceme was hermaphrodite, the stigma being sessile and apparently fimbriate, and the ovary contained one suspended ovule, whilst the lateral flower below it possessed stamens only. On showing the material to Professor Oliver in the Kew Herbarium, he at once recognised the plant as one that he had published some years previously under the name of *Piptocalyx moorei*, Oliv. The ripe fruit of this is unknown, and he provisionally placed the plant in the natural order Monimiaceæ, the habit of the plant being that of Palmeria, a genus in the same natural order. The plant is very little known. It was sent to Kew from the Hastings River by C. Moore, in 1867. It appears to flower in May. It is therefore a remarkable fact that a plant so little known to botanists should be imported into Europe as a commercial article.

The description of the plant is given in Bentham's 'Flora Australiensis,' vol. v., p. 292, as follows:—

"PIPTOCALYX, OLIV.

"*Generic Characters.*—Flowers polygamous. Perianth-tube or disc very short, segments about six, nearly equal, in two rows, very deciduous. Stamens indefinite, filaments filiform; anthers oblong-linear, adnate, the cells distinct and parallel, opening longitudinally; no rudimentary carpels in the male flowers. Hermaphrodite flowers, with stamens as in the males, and a single carpel, with a single pendulous anatropous ovule, and a sessile broad stigma. Fruit unknown. Woody climber, Leaves opposite, entire. Flowers in simple racemes, the males opposite with the terminal flower hermaphrodite.

"*Piptocalyx moorei*, Oliv. in Herb., Kew. A woody climber of 30 to 40 ft. (C. Moore), the branches, inflorescence, and principal veins on the under side of the leaves ferruginous, with rather long, soft hairs. Leaves petiolate, ovate-lanceolate, with a long narrow point, entire or obscurely crenate, rounded at the base, 3 to 4 in. long, rather thin, shining above, pale opaque and minutely glandular, dotted underneath, the veins conspicuous on both sides. Racemes shorter than the leaves, the pedicels very short. Bracts small and very deciduous. Perianth-segments very deciduous, the outer ones ovate-orbicular, 1½ lines long, hirsute outside, the inner ones elliptical or obovate-oblong, thin, all more or less dotted with immersed glands. Stamens about 15, about 1 line long, the filaments rather shorter than the anthers; anthers tipped by a short appendage to the connective. Ovary glabrous, oblong, about one line long."

It may be observed that the plant is not known to be poisonous, and that there is no reason to suppose that it is so. Nevertheless, the use, as a beverage, of a bitter material, of which the physiological properties are unknown, is to be deprecated until its chemical constituents have been examined.

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## MICRO-PHOTOGRAPHY.

BY WILLIAM WOLSTENHOLME.

The following simple process has been found to answer well for obtaining micro-photographs, and it may be useful to pharmacists possessing an ordinary quarter or half plate camera and a microscope.

Remove from the camera the lens and the cross front; cut a thin piece of hard and well-seasoned wood to the exact size of the cross front, and make it to accurately slide in in its place. In the centre of this wood cut a hole a little larger than the eyepiece of the microscope. To fit this hole carefully make a short tube, about three inches long, from a piece of black cloth sewn together, and if necessary made double to render light tight. It may be fixed to the wood by means of glue, but must not pass so far through the hole as to prevent the arrangement sliding into the camera. If preferred the tube may have a few short slits cut in it and be glued on outside the whole, then another piece of wood be made with a hole just large enough to slip over the cloth tube, and the whole firmly secured by means of glue and a few small rivets.

To use the arrangement, slide it into the front of the camera, slip the cloth tube over the eyepiece of the microscope, and firmly tie a piece of tape round, or use an elastic band to secure it. If the microscope can be placed horizontally, all that is necessary is to place it and the camera on a table, raising either the camera or microscope as required.

Get a good light on the object, and focus till sharp on the ground glass, then put in the plate with very great caution to prevent movement of the apparatus. With ordinary slow plates expose from one to ten minutes, according to subject and light. Hydroquinone development answers well. To produce a clear negative, the space between the object glass and the object should be so shaded as to prevent any light entering the tube excepting that which passes through the object.

## THE ANNUAL DINNER OF THE SOCIETY.

The annual dinner of the members and friends of the Pharmaceutical Society took place on Tuesday evening, under the presidency of Mr. Michael Carteighe. Amongst the guests of the evening were:—

Sir Frederick Abel, Bart., F.R.S. (Secretary and Director, Imperial Institute), Professor Armstrong, F.R.S. (President, Chemical Society), Dr. James Bell, C.B., Mr. H. J. Chaney (Standards Office), Dr. Wyndham Cottle, Mr. W. Crookes, F.R.S., Dr. Curnow, Sir W. B. Dalby (President, Medical Society of London), Sir Dyce Duckworth (Treasurer, Royal College of Physicians), Mr. J. T. Thiselton Dyer, C.M.G., C.I.E., F.R.S. (Director, Royal Gardens, Kew), Dr. G. Eastes (President, Harveian Society), Mr. J. L. Ewing (Chairman of the Executive, North British Branch), Professor Michael Foster, F.R.S. (Secretary, Royal Society), Sir Walter Foster, M.P. (Parliamentary Secetary, Local Government Board), Sir A. B. Garrod (Physician to H.M. the Queen), Mr. E. F. Harrison (President, Chemists' Assistants' Association), Mr. W. Hayes (President, Pharmaceutical Society of Ireland), Mr. G. E. Herman, F.R.C.P. (President, Obstetrical Society), Mr. A. Braxton Hicks (Coroner for S.W. London), Dr. H. W. Hubbard, Mr. J. W. Hulke, F.R.S. (President, Royal College of Surgeons and of the Clinical Society), Mr. H. H. Kohlsaat (of Chicago), Mr. Bell Longhurst, Dr. A. P. Luff, Mr. G. H. Makins, F.R.C.S., Professor D. Mendeléeff (University of St. Petersburg), Dr. F. W. Pavy, F.R.S. (President, Pathological Society), Professor G. H. Phillipson, M.D., D.C.L. (President, British Medical Association), Mr. Alfred Reeve (of Melbourne), Professor S. Ringer, M.D., F.R.S., Professor Rücker, F.R.S. (President, Physical Society), Dr. W. J. Russell (President, Institute of Chemistry), Mr. E. C. C. Stanford (President, Society of Chemical Industry), Dr. Thomas Stevenson, Professor C. Stewart (President, Linnean Society), Dr. Thorne Thorne, C.B., F.R.S. (Medical Officer, Local Government Board), Professor Thorpe, F.R.S. (Director of the Laboratories, Somerset House), Mr. R. H. Thrupp (Master, Merchant Taylors Company), Mr. E. Trimmer, M.A. (Secretary, Royal College of Surgeons), Sir H. Trueman Wood, M.A. (Secretary, Society of Arts), and the Worshipful Master of the Society of Apothecaries.

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The PRESIDENT having proposed the health of the Queen, which was received with the usual enthusiasm, next proposed "The Houses of Parliament," coupling with the toast the name of Sir Walter Foster, M.P., who was not only a politician, but a practising physician.

Sir WALTER FOSTER, M.P., in responding, said with reference to the House of Commons, whatever might be the opinions of any particular audience, they would all agree that the members deserved their kindly feeling for the hard work they performed, and the number of hours they spent in doing it. He did not know of any assembly which spent more energy or more time in producing smaller results. But that was not the fault of the Government, which did its best, even if that best was not approved by all, to do what it conceived to be its duty. Though he was a humble member of the House of Commons, he had never ceased to be a practising physician, and in that sphere he found the best relief from his political duties.

The PRESIDENT here read a telegram from Dr. Russell Reynolds, President of the Royal College of Physicians, regretting that he was unable to be present.

The VICE-PRESIDENT (Mr. W. G. Cross) next proposed "The Medical Profession," a toast which he was sure would be received in that assembly with the greatest pleasure. He would couple with it the names of Mr. J. W. Hulke, F.R.S., President of the Royal College of Surgeons, and Professor Phillipson, M.D., President of the British Medical Association,

Mr. J. W. HULKE, F.R.S. (President, Royal College of Surgeons and of the Clinical Society), on behalf of the medical profession, offered his very sincere thanks for the kind reception given to the toast. He said the medical profession and the pharmacists of this country were two links in a common chain, for one could not get along without the other. Where would the medical profession be without the remedies which the pharmacists so carefully and skilfully prepared, and where would the pharmacists be, so far as the higher aims of the Society went, unless there was a medical profession to carefully prescribe the remedies the patient required? Looking back to the days of his boyhood, and remembering the condition of pharmacy then, and looking around and seeing its present position, he could not but realise the enormous advance which had been made; and, remembering that in this advance the Pharmaceutical Society had played so very considerable a part, they might be well content to reflect on the great share they had had in promoting this excellent work.

Professor G. H. PHILLIPSON, M.D., D.C.L. (President of the British Medical Association), on behalf of the British Medical Association also returned thanks. He felt that there was a strong bond of sympathy between the Association he represented and the Pharmaceutical Society. They were bound together very much by the similar regulations, which they all respected, and were bound to honour. He wished the Society every success in the future.

The PRESIDENT next proposed "Science." He said to make a speech in favour of science was a thing no rational being would attempt to do. He looked upon science as a thing to be worshipped, to be loved, and to be adored, and from that point of view he asked them to drink the toast of "Science" without any further words from an ordinary human being like himself. In connection with the toast he would beg to associate the name of a distinguished Russian physicist, Professor Mendeléeff—of whose work they all knew as much as it would be possible for him to say, and who would respond on behalf of mathematical and physical science—and also the name of Professor Michael Foster, who represented biology.

Professor D. MENDELÉEF (University of St. Petersburg), who spoke in French, said he regretted he could not express his feelings in English, but he thanked them from the bottom of his heart for the kind reception which had been given to his name.

Professor **Michael Foster**, F.R.S. (Secretary of the Royal Society), said the pangs of an after-dinner speech were always somewhat softened when speaking to that Society, which seemed to diffuse some subtle substance in the air by which one spoke more easily to them than to any other body, and he was always proud to respond for the science in which he was a humble labourer. But he would ask the President was not the distinction he drew between physical and biological science something really beneath the Pharmaceutical Society. They knew that pharmacy was based on things chemical, it made their reputation, and many of them made their fortunes by their chemical ability, but they did that by acting on living beings, and, after all, was there any real distinction from a scientific point of view. Was not what they called a living being a mere vortex of chemical elements going round and round according to some periodic law, which at present was hidden from them, but which the Mendeléefs of the future would disclose? Speaking on behalf of the many distinguished men of science that he saw around him, all he could say was that they felt that science was sufficiently rewarded by that Society drinking the health of their great brother from Russia.

The **President** next proposed: "Prosperity and happiness to the Pharmaceutical Society of Ireland," coupling with the toast the name of Mr. Hayes, the president of that society.

Mr. W. **Hayes** (President of the Pharmaceutical Society of Ireland), in responding, said it was well-known that Irishmen were not able to convey their feelings in adequate speech, and, therefore, he must be excused if he merely thanked them on behalf of the Irish Society for their kindness in inviting its unworthy president to that gathering, and drinking so heartily the health and prosperity of their little brother in the remote parts of the United Kingdom. He should have much pleasure in conveying to the members of his association in Ireland the kindness with which this toast had been received.

Sir **Dyce Duckworth** (Treasurer of the Royal College of Physicians) next proposed: "The Pharmaceutical Society of Great Britain and the health of the President." He could not forbear reminding them how eloquently this toast was proposed twelve months ago by the honoured chief who since then had been taken to his rest—the late Sir Andrew Clarke. They must all remember the brilliant speech which he delivered on that occasion, and he could not forbear expressing his own sorrow and the sorrow of all at the death of that great and good man. Coming to the subject matter of the toast, he had to speak of this Society, which was now some fifty-three years old, very much about his own age. He remembered in his student days what a veneration he felt for that Society, because the work which was done by it was often brought before the students in the sphere of pharmacy and materia medica. There were great names connected with the Society, which were names to conjure with, Pereira, Redwood, Bentley; and others, who, happily, were still with them. The Society had indeed done excellent work; it had made extraordinary progress from its early days until now, when it covered a very large field of usefulness. The Society had been remarkable for the work it had done and was still doing in its great laboratories, and this was recognised not only throughout the kingdom, but over the whole of the British Empire. The great *officina* of the Pharmaceutical Society was indeed in Bloomsbury Square, and although most of the gentlemen present presided over their own *officinæ*, they were all proud of that great *officina* in Bloomsbury Square, a great workshop which had sent out so many splendid preparations—many of which, as they knew, were very much appreciated—preparations that were certainly elegant. He referred to those skilful and accomplished young men whom they were always glad to meet and be assisted by in their daily work. Not long ago Sir Benjamin Richardson, writing in the recesses of his study for the periodical which was a very remarkable production as coming from the pen of one man, expressed himself to the effect that pharmacists ought to be allowed by law to prescribe across the counter, but he would throw down the gauntlet at once to Sir Benjamin Richardson to come into that room, in the presence of that Society, and affirm that doctrine. He thought he knew how such a proposition would be received. He was quite sure he might be their mouthpiece in saying they would all repudiate that recommendation entirely. He would throw down another challenge, and ask Sir Benjamin Richardson to come and make that statement to the College of Physicians, and he would promise him if he would take a vote upon it he would be left in a minority of one. He felt sure they would all decline to act upon such a recommendation, it was not their work; they knew it was not their work, and did not wish it to be their work. They had something much better to do, and they did it. He was pleased to see that that Society was one of those, of which there were not too many, which had the courage of its opinions. There was a prevailing weakness in this country to-day that both societies and individuals had not the courage of their opinions, in fact, these were very flabby and invertebrate days, in which men were afraid to speak out, in which everybody was afraid of everybody else, and everyone tried to be agreeable and accommodating. That was not his principle. As he went through life he showed his colours, and was not afraid of them. He was glad to see that that Society had the courage of its opinions, and that they now vigorously took advantage of their powers under the Pharmacy Act in prosecuting persons who sold dangerous and poisonous drugs to the poor credulous public, followed them to the courts of law, and obtained satisfactory verdicts. It had been shown how certain tradesmen, with full knowledge of the matter, dispensed to the public dangerous drugs, which were given to infants and others, and certainly sometimes in dangerous doses, the effects of which on the whole must be eminently unsatisfactory and bad for the public. He took it it was for the medical profession and for pharmacists to enlighten the public, and to tell them what mistakes they made, and the jeopardy in which they placed their own lives and those of their children. He wished "more power" to all their action under the Pharmacy Acts. The Society had done immense works, and was doing a greater work than ever, and before it had existed one hundred years it would do a far greater work. Physicians recognised its value and importance, as for instance now when the General Medical Council was constructing a new pharmacopœia, which he expected would be a very remarkable volume. The Pharmacopœia was a book which contained the best formulæ and the best preparations of all drugs which were used by all physicians, because it never recommended preparations, but simply told people what was the best, how to make them good, how to prepare them, and how to recognise them in their purity, leaving it to the skill and choice of those who had to use those things how to prescribe them. Coming to the health of the President, he had evinced already that he was in excellent health, and with such a record as he had in the past, and in the recognition of the great work the Society was doing now, if they would take his advice they would keep him where he was. He concluded by again wishing continued prosperity to the Pharmaceutical Society, and health to the President.

The President, in responding, said he had to thank Sir Dyce Duckworth for speaking in such amiable terms of the work which the Society was doing. All those present were anxious to earn their living, and to do it honestly. He had to earn his living, and he felt that what Sir Dyce Duckworth had said had improved his chance of earning that living, and if it improved his chance, it improved the chance of the humblest members of the Society. The words which they heard from those associated with them in the higher walks of medicine and science on those occasions were words they should take as texts by which they could regulate their daily calling. They had heard during the past year much about ethics, and they had been under certain difficulties on the ethical question. Unfortunately, their parliamentary powers did not, as the charters of the ancient bodies to which Sir Dyce Duckworth belonged, give them power to deal with those who did not regard what they considered a proper code of ethics; but whether they did or did not, it was open to everyone to practise in his own personal business the highest ethics. He was bound to tell everyone in that room that the practice of pharmacy in this country, as understood by the Council he represented, was governed by ethics. They did not want a law; they hoped they were individually strong enough not to require a law to fetter their conscience or their individual acts, but to practise their occupation, whether it was called a trade or a profession, in a manner that should be professional in the highest sense, and which should carry with it the respect of the public. In conclusion, he begged to propose the toast of "Our Guests." There were present that night an unusual number of distinguished guests, but he would couple with the toast the names of three gentlemen, honorary members of the Society, who had been associated with them for many years, who interested themselves in everything they did, and who from their official position and their surroundings were well able to continue their kind services. First he would mention Sir Frederick Abel, one of the newest of their honorary members. He had devoted his life principally to that form of practice which consisted of the destruction of human life instead of its preservation, and it had only been possible during recent years, when he became associated with the Imperial Institute, to feel that he was anywhere approaching the ideal of a person who was connected directly or indirectly with pharmacy. However, having gone into drugs, they had now, with the greatest gratification and honour to themselves, elected him an honorary member. He would also include in the toast the names of Mr. Thiselton Dyer, and Professor Sidney Ringer, also a newly elected honorary member, who associated the practice of medicine with materia medica in its highest sense, and was one of the highest authorities in connection with it.

Sir Frederick Abel, Bart., F.R.S. (Secretary and Director of the Imperial Institute), said he was an old *habitué* of these annual gatherings, and always felt himself one amongst them. He now felt happy that he was one of themselves, and that he had in some way established a footing upon which he was recognised as one of their body. With reference to the dire picture which the President had drawn of him, he must venture to point out that in reparation of that terrible distinction he had worked seven long years with this late friend Professor Tyndall towards the preservation of life in many directions, although not in that particular one in which pharmacists worked. He was now the director of an institute which he believed would work directly in the interests of pharmacy, and he was happy to know that the Pharmaceutical Society appreciated the manner in which that institute would co-operate with it by adding to the resources at their disposal.

Mr. J. T. Thiselton Dyer, C.M.G., C.I.E., F.R.S. (Director of the Royal Gardens, Kew), also responded, and expressed the great gratification which he felt at having been elected an honorary member of the Society. He felt sure that, aided on the one hand by the Royal Society and on the other by the Imperial Institute, it would go on to reap victories beside which those already achieved would sink into insignificance. The Pharmaceutical Society had to face the physiological rivalry between that which had passed and that which was to come. In past times the principal palliatives and remedies for human disease had been drawn from the vegetable kingdom, but latterly the chemist had come in and extracted from these crude products the active principles upon which their powers depended. But there was a still further development going on, for disease in its infinite varieties would probably in time to come be seen to be due to the toxic influences of substances which were built up in the organism itself, and the future progress of their work would probably run mainly in the line of organic and physiological chemistry.

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, MAY 26, 1894.*

*Communications for the Editorial department of the ournal, books for review, etc., should be addressed to he* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, especting the transmission of the Journal, should be ent to* MR. RICHARD BREMRIDGE, *Secretary, 16, loomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the ffice of the* PHARMACEUTICAL JOURNAL, *5, Serle treet, Lincoln's Inn, London, W.C., where Copies of the ournal may be Purchased. Cheques and Money Orders hould be made payable to* "STREET BROTHERS."

## THE SOCIETY'S ANNIVERSARY.

THE annual meeting of the Pharmaceutical ociety, with the accessory events of the Council lection and the annual dinner of the members, ave not this year fallen short of the interest hich usually attaches to those functions. The full ports of the proceedings, which appear in this umber of the Journal, do away with the necessity r any lengthy reference on the present occasion to e various subjects dealt with. Moreover, the space our disposal will not admit of more than a cursory ention of the more prominent features of the eek's work. The annual dinner, which has now ecome an established institution, affording pportunity for a manifestation of the steem with which the operations of the ociety are regarded, has been more than ordiarily successful. The large number of distinuished guests—representing the legislature, overnmental departments, scientific societies, and orporations connected with medicine—present at he dinner, was in itself gratifying evience that the objects and work of the Society re appreciated as being of public importance, and nducive to the general welfare of the comunity. The speakers who responded to the veral toasts proposed gave emphatic exession to their high estimate of the serces rendered by the Society in advancing armaceutical art, and thus assisting the labours the medical profession. It was also pleasant to ar from the President of the British Medical sociation the acknowledgment on the part of body he represents of a strong bond of symhy with the Pharmaceutical Society, and the h for its future success.

he responses from representatives of Science e not less sympathetic, and the approving rence made by Sir DYCE DUCKWORTH to the lic action of the Society as the administration the Pharmacy Act gave satisfactory evidence the efforts to advance the position of pharmacists on a sound educational basis and thus to protect the public against the evils of ignorant empiricism have met with commendation from the highest representatives of the medical profession, and have encouraged the expectation that the future work of the Society in other directions will be equally useful.

The election of members of the Council has not resulted in any change, beyond the filling up of the seat rendered vacant by the resignation of Mr. MARSHALL LEIGH. Mr. GOSTLING, the newly elected member, has already filled the office, as well as that of VICE-PRESIDENT. The opinion that Scotland is justly entitled to two representatives on the Council has been duly endorsed by the electors, who have returned the Scottish representatives at the head of the poll. The fact that little more than one half of the voters returned their voting papers does not indicate the existence of any opinion that the representation of members of the Society is defective, or that there is any dissatisfaction with the constitution of the Council.

The PRESIDENT's address at the annual meeting naturally dealt with the recent proceedings under the Pharmacy Act and the important questions which have been raised in regard to the interpretation of its provisions. It is especially desirable that his remarks on these points, and the remarks by the Society's solicitor, should receive the careful consideration of every registered chemist. As we anticipated last week, the interest of the annual meeting centred in the motion brought forward by Mr. ROBINSON, who urged his views in regard to equality of representation very forcibly, and at considerable length. His chief supporters were Mr. URWICK, who seconded the motion, Mr. BARNARD, and Mr. PERCY WELLS, while the opponents were Mr. HYSLOP, Mr. WARREN, Mr. ATKINSON, and Mr. GILES. The sense of the meeting as expressed by the voting was decidedly against the adoption of the change which Mr. ROBINSON thought desirable in the Bill which is to be introduced into Parliament. The chief ground of opposition was probably the fact that the Society's work has hitherto been carried out by pharmaceutical chemists. For that reason it was thought that however desirable consolidation of the trade and the Society may be, the position of pharmaceutical chemists was to be maintained as it has been, and that the extension of the number of possible representatives of chemists and druggists holding the Minor qualification only from seven to ten fully satisfies existing conditions.

Singularly enough, it was not mentioned in the discussion of the question that the proposal to establish equality of representation in the Council rested entirely on a speculative basis. It was no urged on behalf of actual members of the Society, but only on behalf of those who were expected to become members. If the ten thousand registered chemists who have not taken part in the work of the Society were actually members, there would be greater reason for the view held by Mr. ROBINSON, that they should have a larger representation on the Council. But that position has not been reached. The possible representation of chemist and druggist members is now in excess of the representation of pharmaceutical chemists, and it has not been utilised. The Bill proposes to extend that possible representation from seven to ten members of Council, to make 2562 associates eligible as members of Council, and to extend the voting power to about one thousand associates. From that point of view the measure is a liberal one and, in addition, it offers to some ten thousand registered chemists the privileges of membership.

### PHARMACOPŒIA REVISION.

AN important and extremely useful aid to the compilers of the new pharmacopœia will be found in Mr. WM. MARTINDALE'S "Analyses of Twelve Thousand Prescriptions" (LEWIS), which has just been received from the author. The statistics given indicate very clearly certain directions in which changes have taken place during the last ten years in the current materia medica, as advances have been made in medical treatment and the art of pharmacy.

The prescriptions analysed were dispensed in six pharmacies in typical positions in the United Kingdom — 2000 at each centre — Aberdeen, Bournemouth, Carlisle, Cork, Oxford, and Mr. MARTINDALE'S own pharmacy in the metropolis. The basis of the compilation was the index of the "Extra Pharmacopœia," and the figures given are statistics both of official and unofficial medicaments.

The first place as regards the frequency with which it was prescribed is taken by Spiritus Chloroformi, which occurs 1117 times, and is followed by Tinctura Nucis Vomicæ, 991 times; Glycerinum, 875; and Sodii Bicarbonas, 807. Quininæ Sulphas is seventh on the list (598), Magnesii Sulphas is well down with 262, and the lowest point is touched by Extractum Cannabis Indicæ, Hydrargyrum Ammoniatum, and Succus Limonis, each of which occurs thirty times only.

The figures are given in separate columns for each centre of observation, and the arrangement of the work is such as readily to adapt it for a similar purpose by pharmacists throughout the kingdom. Such compilations are of course valuable in proportion to the extent of country they cover, and it will be distinctly advantageous if Mr. MARTINDALE'S researches and methods be imitated by others.

### CHEMISTS' ASSISTANTS' ASSOCIATION.

WE are asked by the Honorary Secretary, Mr. E. W. HILL, to announce that members of the Chemists' Assistants' Association can obtain the sets of herbarium specimens during the time that no meetings are held, by giving three days' notice to the secretaries as usual.

### BRITISH PHARMACEUTICAL CONFERENCE.

THE "Blue-List," in which subjects are suggested for papers to be read at the Oxford meeting of the Conference, commencing July 31, is now being issued. Several new subjects have been added to the list, and the Committee will be glad to be informed of other matters that may appear desirable for investigation. Titles of papers which it is proposed to read should be submitted to the Honorary General Secretaries, British Pharmaceutical Conference, 17, Bloomsbury Square, W.C., as early as possible, and manuscripts be submitted to the Committee for approval without undue delay.

### PHARMACEUTICAL SCHOLARSHIPS.

WE are requested by the Secretary, Mr. RICHARD BREMRIDGE, to again call the attention of intending competitors for the JACOB BELL Memorial Scholarships and the Manchester Pharmaceutical Association Scholarship to the fact that Friday, June 1, is the last day on which entries for the competitions can be received by him.

### GEORGE J. ROMANES.

THE death of this distinguished scientist occurred on Wednesday, at Oxford. Of Scotch descent, he was a native of Canada, but was educated in England and on the Continent, and graduated at Caius College, Cambridge, with honours in natural science, in 1870. He was an intimate friend of DARWIN, and devoted much of his life to expounding and supporting the theories of the latter. In 1888 he was appointed FULLERIAN Professor of Physiology at the Royal Institution, and for three years also held a chair specially founded for him by Lord ROSEBERY. He published many important works on organic evolution, was a voluminous contributor to current magazine literature, and founded the "ROMANES" lecture at Oxford, the latest incumbent of which was Professor HUXLEY. Mr. ROMANES was elected a Fellow of the Royal Society in 1879.

### DOCTOR IN SCIENCE.

AT the Congregation of Cambridge University on Thursday, honorary degrees as Doctor in Science were conferred on Sir JOHN BENNETT LAWES and Sir JOSEPH HENRY GILBERT, both of Rothamsted fame.

### THE KEITH PRIZE.

ON Monday last, at the eleventh ordinary meeting of the Royal Society of Edinburgh, the Keith Prize for 1891-3 was presented to Professor T. R. FRASER, M.D., F.R.S., F.R.C.P.E., honorary member of the Pharmaceutical Society, for his papers on *Strophanthus hispidus*, strophanthin, and strophanthidin, read before the Society in February and June, 1889, and in December, 1891.

# Transactions of the Pharmaceutical Society of Great Britain.

## MEETING OF THE COUNCIL.

*Wednesday*, *May* 23, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Greenish, Grose, Hampson, Harrison, Hills, Martin, Martindale, Newsholme, Schacht, Southall, and Young.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal fine.

The Council considered the arrangement of the business at the annual meeting, and then adjourned to attend the same.

## FIFTY-THIRD ANNUAL MEETING.

The PRESIDENT took the chair at 12 o'clock, and called upon the Secretary to read the notice convening the meeting.

The report was taken as read.

The PRESIDENT,—Gentlemen, I beg to move that the report of the Council be received and adopted. I must apologise for appearing before you again, but it is not my fault, but that of my colleagues, only these annual sermons probably get a little dreary, and I am afraid I must take to-day a somewhat restricted line, and confine myself principally to the subject of poisons, and our duty with regard to the sale of poisons. And I conceive it will probably be for the benefit both of those who are here, and for those who will take the trouble to read my observations, if I confine myself, in moving the adoption of the report, to that particular part of it, so that unless any question is asked about finance, or any other particular, I propose in the first instance not to refer to the general business of the Society at all; but in my reply to any member I shall be happy to dilate more at length on any particular paragraph that I may not touch upon. I propose, however, to take the paragraphs with reference to the subjects which have occupied the attention of the Council for the past year in a marked degree, viz., the question of the prosecution of offenders for breaches of the Pharmacy Act, and the form of prosecution in fact, which is becoming a little more general than it was a few years ago, from circumstances you will all remember, viz., the sale of proprietary medicines containing poisons, particularly.

### PROCEEDINGS UNDER THE PHARMACY ACT.

We have had as a Council a good deal to do during the past year, and it is not for me to say much about myself, but I can say for my colleagues that they have done very well for us on the whole, and that we have collectively done very well, and have succeeded in enforcing a respect for the law in many parts of the country. But the important question I want to bring before you is this, that we are face to face with the question of what is in law a poison. In order to make myself plain I must just refer to two cases in chronological order. You will all remember that in a case, which is popularly called Delve's case, of a preparation known as "licoricine," containing a small quantity of poison, the quantity not having been determined, the Council instituted proceedings, and the county court judge held that inasmuch as the Society, though its analyst, was not in a position to state the precise quantity of the poison, therefore the preparation was not, as a whole, a poison within the meaning of the Act. The Council appealed against that decision with the view of having that very question raised—the question as to quantity, because you will see before I have done that this question is fundamental with regard to the enforcing of the act by the Council. Unfortunately, the Queen's Bench Division held that there was no question of law to be considered—that it was a question of fact. The county court judge had found as a matter of fact that the substance before him had not been proved to be a poison, and, therefore, they would not hear us at all, so that practically the subject was not discussed. Following this particular case, we instituted proceedings against a Mr. Armson in a case now called the Armson case, because it went to appeal, for selling Powell's balsam of aniseed, containing a poison. It is interesting to note, in connection with this subject, that a particular bottle of Powell's balsam of aniseed, on which we took proceedings, contained less than the usual quantity of morphine in that preparation—considerably less. How that came about I do not know, but that is the fact; and we had, in fact, in the course of a month, two cases involving the sale of this preparation, in one of which there was four-tenths of a grain of morphine per ounce, and in the other, on which we had this fight, only one-tenth. I only refer to it now to illustrate the fact that the quantity, small or great, is obviously dangerous if it is not constant. The association which took an interest in Mr. Armson thought that the one-tenth case was a good one to take to appeal, and they took it to appeal, and the result of that appeal has been to confirm the decision of the county court judge. I ought to have said that the county court judge in this case found that the preparation was a poison, but in order to persuade him that it was a poison we had to bring medical evidence, and to go into a great deal of detail, over and above the mere fact of the finding of the poison, and to incur considerable expense. The learned county court judge found for the Society, with costs. The appeal was sent up to the Queen's Bench Division, and without calling on counsel for the Society, the judges thought that the county court judge was right, and added a rider that it was desirable for the safety of the public that such preparations should be sold under the restrictions imposed by the Pharmacy Act. To complete my story, the counsel for Armson in the Queen's Bench Division asked permission to appeal on the question as to whether a poison within the meaning of the Pharmacy Act meant a preparation into which that poison entered, or whether it meant only the particular pure substance specified, and they obtained leave to appeal, and are going to appeal. In the chlorodyne case, you may remember, leave to appeal was asked for and granted, but the appeal was not taken up. Now leave has been given, and the case will come on in the course of a week or a fortnight for trial, and for the first time we shall probably have before Lord Esher and his colleagues the question, "what is a poison from the legal point of view under the Pharmacy Act?"

### WHAT IS A POISON?

Some of us on the Council think we know what a poison is, but we have the greatest difficulty in persuading the judges of what a poison is. In fact, it has come to this, that if the present state of things continues, what is a poison under the Pharmacy Act will have to be determined not so much by what is in the substance, but by the size of the bottle sold, which reduces it to this absurd conclusion, that an ounce bottle being sold containing only a certain quantity of morphine may be held not to be a poison, but if you sell ten ounces of it then it would be. That is the condition in which the legal mind at present regards the subject of poisons. I need hardly say that for the purpose of enforcing the Act we have a difficulty in getting large bottles; people who deal in proprietary medicines do not keep 9s., or 4s. 6d., or even 2s. 9d. bottles of these preparations; we have to be content with a small quantity, and I confess that I have felt a little disheartened at the time it has taken some of us to educate counsel and judges in regard to this particular subject of poisons. It seems to us that poison is defined clearly enough in the Act, that is, that the definition of a poison is what the Act says it is. It seems a curious thing that judges will in criminal cases regard a poison as being anything which is noxious, but the moment we come on the scene they want to know whether it will kill. I submit to you, not because you are members of our Society, but as intelligent men not necessarily knowing anything of the subject at all, that if a thing is noxious, if, for instance, morphine is noxious when administered without due restriction, surely it is for the safety of the public that the sale should be restricted. In fact, a large part of the schedule contains things which may be said to be less toxic than many of the things outside it. Ergot of rye, for instance, we know that is not so toxic as many things outside the schedule, and so on; but the fact is that the particular preparations of poisons which are used in domestic medicine are just those poisons which affect the public health more than all the others put together. I submit that the position which the Council is taking in this matter is a proper and right one, that if you can find the poison the poison is sold, and the question of quantity cannot arise. Of course if the poison is not there it is not a poison; but if you find it, surely it must be a poison. That is what we are contending for, and that is what we shall contend for in Armson's case if we can get the opportunity in the Court of Appeal. I am afraid we shall not get an opportunity. I am afraid our opponents in this particular case will probably be defeated very early in the day, but I do hope that we shall have an opportunity of arguing our case, because it does happen that by the accident of legal procedure we have never yet had the chance of a considered argument before a judge from our point of view. I mention these things to show you that whatever our disposition may be to enforce the law, we cannot always do it precisely in the manner we would wish. We must be content to take the procedure as we find it, and so far we have not got anywhere near the definition of a poison, or the quantity, and so on, satisfactorily. Now if it be possible for a drysalter or a huckster to sell a preparation called balsam of this or balsam of the other containing, say, a one-twentieth of a grain in the whole bottle, and that is rather the way in which some of the judges have looked at it—I say one-twentieth, or even one-fiftieth, if you like—if it be lawful for a huckster to sell one-twentieth of a grain of morphine diffused through an ounce of syrup or an ounce of water, and call it balsam, clearly it is lawful for you to weigh one-twentieth of a grain of morphine and put it up in his balance and hand it over to the stranger. Yet we are told, "Oh, no, you cannot do that sort of thing. We admit that when he is selling one-twentieth of a grain of morphine he is under the Act, but when he mixes one-twentieth of a grain or one-fiftieth of a grain of morphine with an ounce of water, and sells it, that is a different matter." This is a curious and strange effect to my mind—weakened by long years of pharmaceutical work, perhaps—but it does seem to me marvellous that the legal mind cannot grasp the situation. In fact, with the exception of the learned judge of the Bloomsbury County Court, I am bound to admit the lawyers have made a tremendous "hash" of every case brought before them, but that earned judge is perfectly clear and logical in his view. He has practically told them, "If you sell one-twentieth of a grain of morphine, what difference does it make whether you mix that with three ounces of water or not." But, gentlemen, there is something further behind than this, of great importance to the safety of the public. If it be possible for a huckster to sell an ounce bottle of syrup with one-twentieth of a grain of morphine in it, then it is lawful for him to compound and to dispense one-twentieth of a grain of morphine and mix it with not only an ounce of water, but with an ounce of syrup, and a drachm of this, and a drachm of that, and practically to dispense medicines in quantities which might be held by a court of law to be non-poisonous. Surely these legal gentlemen realise what that means with regard to the safety of the public. The safety of the public with regard to minute doses of poison is of the greatest consequence. It is the particular foundation of our calling, in fact, to weigh up accurately and to dispense medicines in their properly directed doses. It is just the position we are actually coming to. The contention is that if the quantity in the bottle is not enough to kill, any person may sell it. I say that is a fallacy, and if it is true for all practical purposes as regards the safety of the public, a large part of the security is lost.

### OBSERVANCE OF THE SEVENTEENTH SECTION.

Now I have practically taken the substance of these cases in these observations, but I have to refer now to cases of a totally different kind. They do not come in the report at all, but I think perhaps you will think it right that I should refer to the matter, as I did last year, as to every one of us scrupulously fulfilling the conditions of the Statute. We have no right on the one hand to prosecute the huckster and the grocer, and yet consider that we are not bound by the 17th section to obey the letter of the law we are endeavouring to enforce. To put it in the plainest possible terms, it is part of our duty, if we are to sell these preparations, if we are to be licensed specially by statute to sell them, as honourable men to preserve with the utmost strictness the letter of the law. And, therefore, it is not surprising to know that certain of the various associations which are always ready in this country to be formed for any particular purpose, no matter what, think fit to test the question how far chemists and druggists conform with the 17th section in the sale of poisons. Some of these associations have said through their counsel—in fact, their contention in the chlorodyne case was—that if the decision of the county court judge was upheld, it was practically impossible to conform to the 17th section in the case of proprietary medicines. Our answer to that was and always has been, that it is the duty of the seller to register, that it is the duty of the chemist and druggist to know what he is selling. That is our answer to that point. He has no right to sell anything he does not know anything of. It is his business to know, and the judges in the superior court said if he does not know, he must analyse for himself and find out; or there is one other alternative, which is never thought of by those who correspond with me on this subject, and that is, not to sell a thing at all which they do not know. If you do not care to analyse it, do not sell the preparation. Having got to that point, that we ought to know the nature of every poison before we sell, surely it is necessary that we should conform to the conditions of the Act with regard to the sale of these preparations. Of course, I know that the average chemist and druggist sells the preparations in part 2 of the schedule under the usual conditions, and does not often, I hope, if at all, transgress in that particular direction; that is, he puts the label "poison" and the name and address of the seller, that is, his own name and address on the preparation when he sells it. And I must remind you once more that that is a duty be fulfilled in the case of all proprietary medicines' The seller, in this case, is the person on whose behalf a certain preparation is handed over in the shop, and there must be the name and address of the seller on the label. That, I think, is universally done, and I believe it is. But when we come to poisons in the first part of the schedule, involving registration, we are met with some difference of practice, and it is common knowledge to all of you that proceedings have been taken under the 17th section, under which proceedings can be taken by any individual, or any public body, against any of us at any moment for an infringement of the law under that section. Well, proceedings have been taken, and the substances purchased were chiefly Cooper's sheep dip, containing arsenic, and preparations with the name of chlorodyne, and containing prussic acid. Now, taking the second point first: if a registered person sells a preparation which he calls chlorodyne, made by himself, and into which he has put hydrocyanic acid, when such a person is brought into court, and he has not the manliness to say he did put prussic acid in it, but goes on to say it cannot be there because he has taken the stopper out so many times in selling it—when he comes with that kind of defence, I am afraid our credit is in danger of being lost. I could forgive a man for selling it, but I could not forgive him for the reason which he gave, and the attempt to get off the penalties of his act. There is one thing above all others that I am strong upon. When I have done anything wrong, or do anything wrong, and I shall be punished by somebody or another, I always bear my punishment like a man; I do not try to get out of it. Therefore, if any of us who fail to fulfil our duty in this respect, either by ourselves or by our assistants or apprentices, I submit to you that we should not attempt to wriggle out of it, but appeal to the fact that we have made a mistake, and that it is our duty to obey the law.

### POPULAR MEDICINES CONTAINING POISONS.

While I am on the subject may I just refer also to the difficulties that we meet in practice, in selling certain preparations. Those of us who are conscientious I know have difficulties to face of a somewhat different kind; for instance, certain popular medicines, such as Easton's syrup, which is in a sense a popular medicine, and the compound syrup of the hypophosphites, which is practically becoming also a popular medicine, and both of which, as you know, contain strychnine. I am constantly being asked what ought to be done. Of course, I do not know anything about the law, and I give no advice. I find it does not answer to give advice, in the first place because one does not get paid for it, but I generally give the practice of those who come in contact with me in the ordinary work of pharmaceutical life. It is, of course, naturally said, What do you do with Easton's syrup? What I do, and what I conceive to be the proper thing to do, and I am prepared to test the matter in a court of law if I am ever challenged as to the legality of this, and I give it for the benefit of my fellow members, is this—but they will please understand I am not laying down the law—Easton's syrup, sold as Easton's syrup, with an ordinary slip label, certainly comes within part 1 of the schedule, and must be signed for. On the other hand, the ways in which it is asked for vary so much that it is practicable, and sometimes it is desirable, and in many instances it is even safer, to treat the order as a prescription, to enter it in the prescription book, to put directions for use on the label, and then, of course, it is not necessary that there should be the signature. Either of those two courses, in my judgment, is a sufficient protection to the individual. Some of you may say, perhaps, that this is sailing rather near the wind, but I would ask you to refer to the section, and I think you will find that there is not, as was indeed contemplated by the Privy Council at the time the Act was passed, such a wording of the section as that it should be impossible for one to dispense any prescription containing poison under those particular conditions, unless the prescription were written by a duly qualified practitioner. Those words are not there; they are specially left out. But I do not want any special pleading. I follow rather the commonsense view that the security of the public is of course obtained by the skill and knowledge of the man who sells. An abuse of that kind would only be an abuse if the thing were carried to an extreme. If a person comes in and asks over the counter for a preparation of that kind, the 17th section allows a person registered under the Act to dispense the poison without reference to who wrote the prescription, the man himself or anyone else. That is my reading of it, and the true intent of it. But I do not see myself any great difficulty in getting registration in the majority of cases. I am not laying down the law, but laying down what I think is one's practice in connection with these preparations. The compound syrup of the hypophosphites of course comes in the same category. If we do not observe the precautions imposed by the 17th section in the sale of such a preparation as the compound syrup of hypophosphites, one form of which is a proprietary medicine, we shall be liable to the imputation that there is no greater safety in the public receiving these preparations from the registered man than from the grocer or the huckster.

### PATENTS FOR MEDICINAL COMPOUNDS.

Lastly, with regard to these law cases, I may just refer to the question of patents. We have had several cases to deal with. It seems a remarkable thing that any form of rubbish can be patented. The most absurd thing can be patented, and when the patent is obtained it is necessary for us, or for anybody else who wants the patent reviewed, as it were, to take a somewhat costly and roundabout proceeding to get the patent quashed. But, of course, the patent law was not, I think, intended to apply to medicines in the ordinary way; but the fact is that anything is patented. If a person chooses to go to the Patent Office and claim for the spirit of sal volatile in the pharmacopœia that it is a useful medicine, and put the ingredients down, the Patent Office will patent it, take the fees, and let him do what he likes with it. And in order to quash that patent you must obtain the fiat of the Attorney-General, go before a judge, and go through certain formalities. We found it necessary to take proceedings to quash some of these patents. As far as we are advised—and I think I may say we have gone to the highest quarters for advice—the quashing of a patent means quashing it *ab initio*, and then that patent ceases to exist; and not only that, but, as I understand it, it is considered as having never existed. Without that, I am not sure that any benefit, with regard to the safety of the public in this direction, would be secured by quashing these patents. But it is interesting, if not amusing, to see the preparations which have been submitted. Some of you probably may have seen the patents, and in the course of a week or two you will probably see another patent, which is the subject of consideration, which I will not refer to now, which will interest you, as showing the ingenious devices by which clever people may go to the Patent Office either to circumvent an Act of Parliament, or to benefit their pockets. One of the difficulties we have had in these matters arises from the fact that all these proceedings are costly. They will cost a considerable sum money, and one of the difficulties of the Council in these matters is that some of the patents were taken out by comparatively poor people—by nurses of no means, and, of course, ignorant, as all such people usually are, of anything really appertaining to medicine; and we have to be very discreet in going before a judge in asking for this revocation where a person, whether a man or woman, has been allowed a patent, and is of comparatively small means. We are always in the position of being regarded as a rich corporate body, and the feelings of the judge are usually against corporate bodies pressing unduly hardly upon individuals. Consequently, we have had, and may have in future, to take costly proceedings for the purpose of revocation, and be content to be very magnanimous when a revocation is granted, and to say we are content to forego the costs. I mention this for the benefit of my successor in the presidential chair, because next year you will have a very big bill to pay.

### EXTENSION OF THE POISON SCHEDULE.

Carbolic acid, as you know, is not added to the schedule; and that completes the subject of the paragraph bearing upon the sale of poisons, which I said I would refer to. You remember that the Council passed the necessary resolution, but we have received no communication from the Privy Council on the subject. But that you must not take to be discourteous—that, I believe, is the proper thing to do—when they do not approve they do not write to say so; but they have in Parliament told us that, having regard to the conditions under which carbolic acid is required for public use, they do not think it wise to include carbolic acid in the schedule. Now, one word with regard to this subject, and kindred subjects. There is a very strong feeling from time to time expressed that the schedule should be enlarged—that the Council is a weak-kneed body because it does not have a number of things put into the schedule straight away, forgetting, in the first place, that the Council's power is absolutely *nil* without the Privy Council. Our power is simply that of being able to prevent the Privy Council putting in anything they would wish into the schedule, and our power is barred just in the same way by their right to refuse their assent to it. So that, for the purpose of law, it is necessary that the Privy Council itself should be satisfied that any article should be put in the schedule. Now, there have been cries of this kind from time to time raised, and I have had much correspondence on the subject, and I desire to give this little piece of paternal advice. I know it is not good to give gratuitous advice, but still I am going to give it. The question of the sale of poisons, twenty-five or thirty years ago and now, has always been a difficult one to deal with. Restrictions of every kind on such things as are considered articles of trade, even if they be poisonous, are not easily put by a legislature like ours on any commodity. Monopolies are not readily granted to any class of men; and at this particular time, when we are endeavouring to secure the public welfare by the Act as it is, I submit that it is not politic to clamour for too much. If there is any attempt made in that direction, I feel sure we shall be met with the proposition that it is desirable there should be restrictions on carbolic acid and a number of other poisons. But these restrictions will be mechanical restrictions on all who sell, and not restrictions of the sale to duly registered chemists and druggists. I hope, gentlemen, I have made myself plain. I mean, in other words, that the tendency, as we all on the Council know perfectly well, and as was shown by the reply of the Vice-President of the Council with respect to this very subject of carbolic acid—that the pet dream of the Privy Council office—is to have a third schedule of poisons, to put carbolic acid, nitric acid, acetate of lead, and a number of other things of that kind into a third schedule, and thus you get another statutory form of poison to be sold by anybody. Do you think, gentlemen, that would be good for the pharmacist? I do not think it would; and, therefore, I suggest that we should be moderate in all these things, and not endeavour to force, as it were, the commerce of the country, that portion which is still outside the Pharmacy Act, too much into our hands. The views with regard to the interpretation of what is a poison as expressed by the judges, with reference to our recent proceedings, are of course open to the Privy Council to read. Their adviser looks at all these things; he naturally has to advise them what he thinks of the situation all round, and we are contending for the definition of the poison, which is a wide one, and we must not be surprised if for the moment there is a little hesitation to increase the number of preparations in that schedule. My suggestion, therefore, is that we should carry out as far as we can our Act, and take proceedings in regard to the sale of those poisons which are within the schedule, and be content with that until the public is better instructed. When the public is better instructed, the Privy Council will be better instructed, and I think the time will come when it will be found that with a number of registered persons spread all over the country, there will be no inconvenience whatever to anybody in restricting the sale not only of carbolic acid, but a number of other preparations, to registered men. But while we are taking proceedings against hucksters, grocers and others for the sale of proprietary preparations, and producing in their minds the notion—an erroneous notion—that our object is not a legitimate one, that we are forcing an interpretation of the Act which was never intended—while we are doing that, it seems to me it is not exactly the time to speak too much about increasing the number of poisons in the schedule. Gentlemen, I apologise for having said so much on the subject, but I get so many letters upon it that I like to be able to talk straight on some of these points. Of course, whatever observations I have made to you have nothing to do with any of my colleagues on the Council, I only am responsible for them.

### PHARMACY ACT AMENDMENT BILL.

Before I move the adoption of the report, I will first refer to the clause affecting the Pharmacy Act Amendment Bill. I am not going to say anything about it now, because I think it will be convenient for us to leave that until we have disposed of the details of the report, and Mr. Robinson can make his proposition. All I have to say with reference to that is that the Bill consists of certain clauses taken from a Bill drafted four years ago, and that the particular reason for drafting a small Bill of this kind was a desire on the part of the Council to deal with the consolidation of the Society, in the hope that there might be no opposition to such a proposal, and that even in the present somewhat congested state of business in the House of Commons, we might be able to make some progress, and even to pass it. The Council is, of course, as sensible as everyone of you with the fact that it does not deal with many questions of considerable importance to the craft, but it was drafted for a specific object, and as such I think it is to be commended. I say this because some of our friends think there cannot be any good in going to Parliament unless you seek for certain fresh powers in the direction of restrictive legislation on the sale of poisons, and so on. A number of our brethren, as you know, are very strong on the subject of company trading, and we all feel equally strongly ourselves on that point, but we felt as a Council that if it was possible to eliminate from some of our drafted Bills the subjects which would excite opposition, we might possibly have some chance of getting approved by Parliament certain internal regulations amongst ourselves, as members and associates, which would conduce to our stability and increase our power. Those were the objects with which that Bill was drafted. Those clauses are not new; they were taken from a Bill drafted some four years ago, and the whole of that Bill was considered at different meetings throughout the country. I had the opportunity and privilege of being present at a good many of them, and the general concensus of opinion at that time appeared to be in favour of all those clauses; consequently, the Law and Parliamentary Committee put those clauses to the Bill, and presented it to the Council. The Council approved of it, and at present that Bill is ready to be presented to Parliament, and will probably become the subject of your discussion after the adoption of the report. I hope my friend Mr. Robinson will feel that I am not going to take any of his thunder away. I am only desirous of pointing out that there is no new departure in what the Council has done. It has simply resolved a second time that certain clauses should be put in the form of a Bill and presented to Parliament. I now beg to move that the annual report and statement of accounts now submitted be received and adopted.

The Vice-President seconded the motion, saying he would reserve any observations he might have to make if necessity arose.

The President: I shall now be happy to hear any observations from members on the report.

Mr. Atkinson: Perhaps it might be convenient if Mr. Robinson moved the amendment which stands in his name.

The President: Mr. Robinson is to propose a motion; it is not an amendment to the report. I think it would be much more convenient to dispose of the report, and then discuss Mr. Robinson's proposition afterwards.

Mr. Robinson: I have no amendment to the report.

The President: So I understand.

Mr. Lomas: This question of poisons, I think, is a very important one, and I think the position that the Council have taken in this matter is the correct one—that it is no matter what quantity of poison is contained, if it is a poison within the Act. I think that is the stand you must take, and you must educate the legal profession to that point of view, as they seem to be quite ignorant of the Act. Suppose the judges say it is so small a quantity it cannot do harm, very well; in the case you have cited of Powell's balsam, I think there was such a small quantity the judge would not find in your favour.

The President: That was the licoricine case.

Mr. Lomas: Well, take that preparation. Just take me to be one of those cutting co-operative store cutters. I go to the proprietor of that medicine, and I say to him, "I will give you an order for a hundred gross of that, but you must have so much of the active principle in and no more, because then every huckster can sell it." That is what I understand is the judge's point of view of these patent medicines. All I have to do is to reduce the quantity of poison, and then you are incapable of doing anything in the matter. If that is to be held to be the meaning of the Act, then I say it would be a very bad thing for the chemists as a body. Now there is another point. You know questions are being asked in Parliament every day on matters connected with pharmacy, and I have urged on you on more than one occasion the importance of this matter, that the Society should be more ably represented by one or more of its best members in the House of Commons. You hear from the President to-day that the lawyers want educating. There are plenty of them in the House of Commons, and what we want is an able member there to take up a question when it is put, and answer it there and then. You have men here, both in and out of the Council, who are as well able to take part in the making of the laws of this country as any of the Irish members in the present Parliament, and it is for you, gentlemen, to bring pressure to bear on the Council of this Society to push the matter on, and not allow it to remain in the state it has been ever since the death of the late Jacob Bell. You were represented in the House of Commons then, and have been outside ever since, and whenever you want anything done in the House of Commons, the President or somebody else has to go and dance attendance in the House of Commons, but they never know what is going on in the House until it is done. They should be there to take part and to uphold the interests of this progressive Society. I have been content on former occasions to simply talk, but I think I am within my rights in taking the opinion of the meeting. I have no wish to move a resolution, I cannot do that without giving notice, but I want to take the opinion of the meeting on this particular point, that the members should put pressure to bear on the Council on this question. Is it necessary that we should be ably represented in the House of Commons, and if so, who are the proper parties to do it? Well, the Council are the proper parties, as you know. There is plenty of energy, but it is latent, it wants rousing, and I should like you to put it from the chair—whether the members are in favour of this pressure being put on the Council. I am within my rights, am I not?

The President: You would not expect a poor man to suggest the guillotine should be placed upon him by his own motion. I represent the Council, and I do not want you to put pressure on us. We have enough pressure as it is; in fact, we are suffering from over-pressure.

Mr. Lomas: I think you can stand a little more. We do not live for ever, and I want to get as much out of the present Council as I can. I think you do not quite understand me, sir. I wish simply to take the opinion of the meeting on this point.

The President: I am afraid I cannot allow it. It is out of order. You may talk on the subject for any reasonable time, but I cannot allow you to put any resolution, nor can I put any proposition of the kind before the meeting.

Mr. Lomas: Well, I hope when I resume my seat that your acclamations will show that you are in my favour. Then there is another question. In the *Pharmaceutical Journal* for April 14, there is an article headed "What is an open shop?" and it goes on to state the difficulties the Council have to contend with in getting information, and that, when they have got all that, all their efforts, and the expenses attending those efforts, are only on account of mere technicalities, and it goes on to urge the importance of the members considering these things when they complain that the Council of the Society does not enforce the Act as it should. And it also goes on to say, what is most important, that the expense of prosecuting in the interests of the public—mind that, gentlemen—and to get a little for the chemists if they possibly can—but yet in the interests of the public—the expense of these prosecutions is borne by the 4000, or one-third, of the members of the trade who are members of the Society. It also goes on to say that is the reason why the outsiders should enrol themselves, to put money into the coffers of the

Society to be spent in the interests of the public. Now, gentlemen, a more lame argument than that I have never read in the Journal since it commenced. Here you expect these outsiders to come in and give you money to prosecute in the interests of the public. It is perfectly monstrous. I do not know what you could have been thinking about. There are hundreds and thousands of these outsiders who have great difficulty in making both ends meet, and you want to tax them extra in that way. If that is the only argument you can get to bring outsiders in, it will be a long time before they come in. Members who wish to get on the Council may talk about what they consider right, and in one case, in a circular sent out, it was said that every chemist and druggist should be exempt from jury service, and that gentleman, who is on the Council now, said he should use his best endeavours to bring about that desirable object. That secured that gentleman's election, but you are as far off as ever from the exemption. I tell the outsiders plainly, if they want exemption from the jury service, they must enrol themselves members of the Society, and until they do so they have not the slightest chance of being exempt. The pharmaceutical chemists are a united body, and they can deal with them, but the others are a body scattered all over the country, like sheep. You have to be gathered together, and then you will get all you want. I trust if any of you know of a member who is able and willing to act, that you will put him in Parliament. You cannot have a better man than a gentleman who is present to-day. He knows his way about as well as anybody, and I again say that we ought to do something to get ourselves better represented in the House of Commons.

Mr. ATKINSON: The address we have just had the pleasure of hearing from the presidential chair, although it did not quite follow the lines of the former addresses, still nevertheless has fully maintained that standard of excellence we are accustomed to. On former occasions we have had what I may call a general *resumé* of the year's proceedings, and I need scarcely tell you that we got that *resumé* perhaps from the most favourable point of view. It is not possible, and I am not sure that it would be advisable, that we should all entertain quite that roseate view of the actions and policy of the Pharmaceutical Society which with Mr. Carteighe amounts almost to an ineradicable instinct. I have no doubt that many of you gentlemen whose liberality of opinion enables you to read that weekly journal—as I think that indispensable weekly journal—which deals mainly with the commercial side of pharmacy, will have noticed some comments on one of Mr. Carteighe's characteristically optimistic speeches. I think those Tories of pharmacy who do not run after "strange gods," but who derive their knowledge of what goes on in the pharmaceutical world entirely from the pages of the official organ, have some cause of complaint, because that report of the speech, which seemed to trouble the editorial mind of the *Chemist and Druggist*, was not recorded in the *Pharmaceutical Journal*. Now, for the general enlightenment, I would first say that this was an after-dinner speech. One need not be a profound student of psychology to know that after a good dinner and its concomitants a man is likely to feel on pretty good terms with himself. It makes him more generously disposed, somewhat loquacious, and in extreme cases somewhat pugnacious. I am not responsible for the report, but Mr. Carteighe is reported as saying that he had no one to attack him; that he wished someone would attack him vigorously; he had disposed of all objectors and all objections to the policy of the Council. Even the press had not any fault to find with him, and lastly—I assume this is some national observance—he begged anyone to tread on the tail of his coat. He congratulated the Society on having disposed of all its enemies. We are told to rejoice with those that rejoice, and to weep with those that weep, but in the circumstances can we withhold our sympathy from our pharmaceutical Alexander, who, having exhausted the resources of Bloomsbury Square, is bold enough to invade the city, and declare he is spoiling for a fight. Now, gentlemen, turning to those legal matters which the President has reviewed, he said he would deal with them in chronological order. I propose to go a little farther back, to the Piper case. The Piper case, to my mind, established two propositions, first, that a patent medicine is a thing *sui generis*, and secondly, if the whole contents of the bottle or preparation contain a sufficient quantity of a poison, it would then bring it within the scope of the Pharmacy Act, and could only be sold by a qualified vendor. Having established those two propositions, why did the Council fail in the licoricine case? They failed because they purposely, I believe, refused to supply the very evidence which would have secured the conviction. I am not sure that I am not using Mr. Carteighe's own words, but I say that, if you want to confound and overcome your adversary, the best thing you can do is to knock him down at every opportunity. Now I think the Council was probably somewhat premature in raising that point. I do not think it was forced upon them. I think they might have secured a conviction there if they had felt disposed, and it has landed us in a position of very considerable gravity. There has always been, and Mr. Carteighe knows that as well as anybody else, an opinion held by the law officers of the Crown that there is what I may term a vanishing point in these matters, a point where common-sense intervenes, and the law ceases to be operative. Every judgment I have read seems to bear a significant warning of this. In the Armson case this idea seems to have been elaborated. The judge, in effect, said: "I find for the plaintiff, because the medical evidence satisfies me there is a sufficient quantity of a scheduled poison in this bottle which might be fatal to some tender form of human life." He argues the case at great length, and seems to split the matter up very fairly. He does not in so many words say so, but you can see clearly what was in his mind, that if instead of the quantity being $\frac{1}{16}$th of a grain it had been $\frac{1}{30}$th or $\frac{1}{50}$th, his verdict might have been the other way. Now, this has brought us face to face with this difficulty, that we may have manufacturers making bottles of their preparations which will contain just so much of a scheduled poison that it will be difficult and perhaps impossible to sustain a conviction. And you have imported another feature into it, that is, that the view of these cases is likely to turn in a great degree on the contest between rival posologists. Every gentleman here knows the enormous diversity of opinion there is amongst medical men with regard to doses. I remember the case of a medical man who stated on oath that two drops of paregoric had been fatal to a child, and on the other side I quote from a former case where a chemist was sent for manslaughter because he refused to recognise two 4-drachm doses of digitalis as a safe and proper dose.

The PRESIDENT: May I ask you to elaborate that a little more, Mr. Atkinson? I think I practically said the same thing as you do. Will you point out how we have offended in bringing this about. I think we are trying to obviate it as much as we can. I do not mind your criticism, but you are generally so logical and I am not quite able to follow you.

Mr. ATKINSON: I think you might have waited until these points were raised, but you raised them.

The PRESIDENT: No; they were raised by our opponents, not by us.

Mr. ATKINSON: When you went into court with the licoricine case you might have supplied evidence of the poison there, and then you could have secured a conviction.

The President: I do not say that we could.

Mr. Atkinson: At any rate, you would have had a much better chance of doing so

The President: It is always easy to be wise after the event. The judges up to that moment had been satisfied with evidence, by a competent analyst, of the presence of the poison, and had never in practice taken medical evidence at all. At the present moment we do not, as a Council, hold that medical evidence is requisite, and we are going to the Court of Appeal to contest that point.

Mr. Atkinson: Then I am under a misapprehension in some particulars.

The President: I agree with you, that if we had had medical evidence in that case, our chance of securing a verdict from the county court judge would have been much greater. As a matter of fact, we did not have it, because we had never previously done so, and never thought it necessary. Then we were brought face to face with the fact that we must produce such evidence, and we have done that since. We, in fact, have learnt our lesson, and we must submit to the responsibility and censure of yourself and others for not in this case securing a verdict. We are quite ready to do so.

Mr. Atkinson: With regard to the number of small prosecutions which the Society has undertaken, I am bound to say I think they are deserving of the very greatest credit for the way in which that part of the work has been done. I believe it has been done fairly and equitably, and never in the annals of pharmacy has the law been so much respected as it is at the present time. But I regret to say, gentlemen, that I have noticed an apologetic tone in relation to these prosecutions. I am taking it, of course, that the *Pharmaceutical Journal* not unfairly reflects the opinion of the Council. They seem to have gone out of their way in saying that these prosecutions would not have been undertaken except for the outside pressure, and had to apologise lest the public should think that they are taken with a view to chemists securing a monopoly. Whoever heard of the *Lancet* or the *British Medical Journal* apologising because they thought they were claiming a monopoly in the practice of physic when they prosecute an unqualified man? This is a monopoly especially created by the Imperial Legislature of Great Britain. Why was it created? It was created because at that time there were serious apprehensions that poisons and dangerous drugs were sold anywhere, anyhow, and by anybody. The public said this matter required control, and Parliament listened to the voice of the public. It gave you certain powers, virtually a monopoly.

Mr. Lomas: No monopoly.

Mr. Atkinson: Who else is to sell poisons except the chemists and druggists under the Act of Paliament? I call that a monopoly.

Mr Lomas: No; it is in the interests of the public, it is not a monopoly.

Mr. Atkinson: Parliament said it should not be necessary for you to come to the law officers of the Crown, but we will make you, the Pharmaceutical Council, the sole arbiters when your rights are infringed, and we will give you ample powers to punish offenders. I say a more generous concession was never given by a British Parliament pledged up to the hilt to the principles of free trade. I say a concession so liberal was never more persistently ignored and neglected. I am sorry to pursue this subject, gentlemen, but I mean to put the saddle on the right horse and have done with it, and therefore I will refer a little further to this particular matter. "If there be one circumstance more than another by which chemists and druggists collectively have laid themselves open to reproach, it is in having failed to take greater advantage of the legitimate provision for restricting the sale of articles to which the Pharmacy Act relates." Gentlemen, I never saw a more bare-faced attempt to avoid responsibility. Could any twenty chemists, could any two hundred, could the whole community take any action whatsoever? The very foundation of the pharmaceutical faith is that the Council, and the Council alone, has the power of action in relation to these matters.

The President: But how is the Council to get the knowledge?

Mr. Atkinson: If anyone will take the trouble to wade through the columns of the pharmaceutical press from the year 1868 downwards, what will they find? They will find there was one long persistent cry from chemists and druggists in every part of the country that their rights were invaded, that poisons and dangerous drugs were sold in every village, in every huckster's shop. I say the Israelites in Egypt were no more successful in endeavouring to soften the heart of Pharaoh than these poor distressed chemists of Great Britain were in their ineffectual appeals to the inflexible hierarchy of Bloomsbury Square. Pharaoh, gentlemen, stands as the historic symbol of obstinacy and immovability, yet you, gentlemen, who in the struggle for existence have not quite forgotten your Bible history, will remember that Pharaoh did, at the instigation of Moses and Aaron, ultimately let the people go. But all the persuasions of the coroner for Mid-Surrey, all the blandishments of that energetic Secretary of the British Medical Association, or their combined efforts, were not able to move the adamantine resolve of the Council of this Society. Even the Moses and Aaron of the pharmaceutical era were insufficient. It required, and they seem to be proud of it, the *mandamus* of one of Her Majesty's judges to direct them to move. If we turn to the numerical statistics of the Society I am afraid they are not very encouraging. You have sustained losses. There are certain losses that are inevitable and irrevocable, but there are losses which this Society sustains which I believe to be preventible, at all events I am willing to hope so. I allude to the abstention of young men from joining the Society. I have given some attention to this matter, and tried to get at the bottom of it. I find that really it is mainly due to misapprehension and ignorance. Do not misunderstand me when I use the term "ignorance." I mean ignorance of the origin and application of the laws affecting pharmacy and its relations to the State. I find young men coming up from the provinces with a distinct bias, which I regret to say, in too many cases they have acquired in their early training. I have been fairly successful in endeavouring to overcome this prejudice, and I have succeeded in getting some seven or eight young men to join this Society. There are something over 4000 who are within the pale of the Society, and something over 13,000 outside it. Well, if every gentleman will apply himself to this matter, even to this limited extent, we shall soon, to alter the sentiment of a popular ballad, know where we are. At a recent Council meeting many gentlemen were giving their experience. I dare say local secretaries can do very useful work in this connection, and they might pick out some of those fossils of pharmacy who will not understand that they can get a good guinea's worth from joining the Society. One gentleman made the statement that when he was going round he met with more courtesy than cash. Well, I think he was very fortunate. I undertook some few years ago to go round a very extensive district with a local secretary, and on one occasion we found our visits were resented. When we explained the object of our visit, and incidentally dropped the words "Pharmaceutical

Society," that exploded the magazine. Nothing could convince that man that he would gain any advantage whatever from joining the Society, and he was typical of a great many. The moment you mention the Society you had better walk out of the place. There is only one subject more, gentlemen, that I will just touch upon, and that is the possibility of the code of ethics. I am quite in accordance with the decision the Council came to with regard to the matter. I think at present any such thing is impracticable, but it is a distinct advantage to hear that subject discussed at all. We must remember from whence that discussion originated. The assistants of to-day will be the masters of to-morrow, and we have to step from one rung of the ladder to another. In the lines of Tennyson:

> "Oh let me prove with him who sings,
> From one pure harp in divers tones,
> That men may rise on stepping stones
> Of their dead selves to higher things."

Every one of us may be a stepping stone to something that is riper and better. Looking round, I think pharmacy is making progress. It is slow, but it is on sound lines. When the Society was founded its first function was education, and that function has been faithfully maintained. Whenever I look at this phase of pharmacy I look at it in a spirit of unqualified admiration. A Society which first commenced to educate itself, and then took care that all who in future should come into it should be as well or better educated themselves—such a Society cannot possibly be retrogressive. The day is coming perhaps when it may be declared throughout the length and breadth of the land that there is not a man on the register who is wanting in ability to discriminate between that which is good and that which is bad, taken in its very widest significance.

Mr. Flux (the Society's solicitor): May I be pardoned for interposing a word or two. One question has been raised, as to the need of medical evidence concerning the quantities of poison in compounds which are brought to the attention of county court judges. County court judges are human, and we find in some places a disposition to fight the question is much stronger in the nature of the judge than is the case in other directions, where the judge perhaps forms the opinion that this is a highly beneficial Act of Parliament. But as to whether the expense, which is really serious, of putting medical evidence in the box on all occasions is really a necessity, the advisers of your Society are very much oppressed, and I may mention that I have been advised by counsel of very great eminence that it ought not to be necessary to give any evidence of more than the presence of poison. The Act of Parliament uses language which would generally be considered clear as English language. You will find that the second section of the Act to regulate the sale of poisons commences with these lines, "The several articles named or described in schedule A shall be deemed to be poisons within the meaning of this Act," and the view which I want to get the courts to adopt is that we have only to prove the presence of the poison to come within the operation of those words, which say the poison is a poison within the meaning of the Act, and therefore within the mischief of the Act, and that the sale of it by an unqualified person carries with it a penalty. You will observe that in the particular case the county court judge decided that we had not given evidence that the article was poisonous. I submit that the judge in that respect was wrong, but the judge found that because we had not given that evidence it was not proved to be a poison, and when we got to the court above the judges said, "We cannot hear this appeal; we cannot hear you argue this question out, because the judge has found a question of fact, and you cannot appeal on a question of fact.' But I hope to come before some other county court judge some day who, on similar evidence, without the presence of any medical man in the box, will give me a verdict on the words of this Act, and if I can get such a verdict from some county court judge, I believe in being able to hold it, and that will very materially diminish the trouble and expense of carrying these cases before county court judges. Furthermore, I want you to observe with regard to the decisions which have been given in the Royal Courts that they have been given on the statements of facts made by the counsel on the other side; that our counsel have not been heard, the judges having dismissed the appeals without our being called upon, so that really we have not had a chance of bringing this view of the law before them. I say the law was intended to be simple, and the simple view is that for which I contend; but we have not had a chance of bringing this simple view at all before the courts. I do not want pressure here which shall impede our doing it. I am not standing simply on my own opinion, but I can say that a counsel of great eminence and high authority is of opinion that these words are adequate in the premises. Furthermore, I want to say that I want to contend that it should not be necessary for medical evidence to go the length of saying that a given proportion can in any event cause death. I want to establish the fact that a proportion which may be injurious to health is quite sufficient to show that it is a poison within the meaning of the Act, and is a mischief which the Act is intended to remedy.

Mr. Róbinson: I have much pleasure in supporting the report of the Council for this year, because to my mind it is eminently satisfactory, and after the explanation from the solicitor we have just heard, I think the Council are well advised in the course they are now pursuing with regard to the sale of poisons. I do not propose to review the history of the Society during the year, but on the main principles I think we can all be thoroughly satisfied that the report is a very promising one, and that we have positively made £1300 in the year, and what is more remarkable, we have even made a slight profit on the law. In the main, therefore, the report is eminently a good one; the main thing is the number of persons who have come forward for examination. There the excess of receipts over expenditure is about £5000 this year. We seem to have received from the candidates coming forward over £8000, and the fees for the examiners, including refreshments and all expenses, do not come to more than £3000. I think that is a very healthy sign, and I am glad to see that the report says there has been a marked increase in the number of candidates coming forward. I hope that marked increase will continue in a moderate degree, certainly. With regard to the remarks of Mr. Atkinson, in which he seem to think that the Council had been lax in its duty i taking the position it had, I would ask him whos fault is that? Why did not he take part in sending oth men to the Council, if those upon it were not doi what they ought to do? I do want to impress th view on the whole of the members. It is no grumbling at the Council when you have such a Societ in which you can send, if you like, practically any m you like. Therefore, I am very glad indeed to supp the report of the Council, and I hope it will be una mously adopted and—if I may say so properly—wit out very much more time being spent upon it.

The President: Before I put the proposition to th vote, I should like to say that I ought to have refere to the question of keeping open shop, but I do n want to mix that point up with the actual presence poison and other matters. It is a fact that the co court judge found that a watchmaker who sells a paration containing 50 per cent. of corrosive subli does not keep an open shop for the sale of poisons. That is a fact, and although I think there is no doubt what the effect will be on an appeal, that is actually so found, and those of you who can read reports and try and divest yourselves of the fact that you are chemists and druggists, and try and look at it with a sort of lay mind, will see the ingenuity with which the counsel tried to show, from the preamble of the Act, that it was necessary for the purpose of protection of the public that persons keeping open shop for the sale of poisons should be qualified, and he based his argument very largely on that point. I do not think there will be any difficulty in getting that verdict reversed, but that is found as a fact. Another case which is pending in Scotland is of considerable importance. I referred to it at the last meeting, and you must not imagine that I leave it out because it is referred to here. It is the question how far the unregistered servants of a medical man can sell poisons. It is a Glasgow case; we have had occasionally to pay a visit to Glasgow, and we find there that the custom has been—it is now mending—for medical men to have several shops, to put a boy or a girl into them, and go and look after their practice during the day, and let the girl or boy sell poisons. The sheriff found for us in that case; the defendants have appealed, and the argument has been heard before the full court of judges in Edinburgh. Some of the arguments you have probably seen, and will have noticed probably as keenly as myself how extremely difficult it appears to be to get even a Scotch judge to understand our Act. I have had that experience in the South, but I thought Scotch judges would be longer-headed, and would grasp the matter a little more quickly; but I am afraid there is the same difficulty there. However, those gentlemen have to give their decision, and I have reason to believe that the decision will be in conformity with that in the Wheeldon case, but if it should not be, I want to point out to you where we are. The law in England will be different to what it is in Scotland in that particular, and we shall have to take steps to deal with the matter, and possibly get an appeal to the House of Lords in another case. This appeal by Scotch law being for a penalty of a small amount, such as was sued for in this particular case, there is no appeal to the House of Lords, and we should have to take some other legal process for having the decision of the court reviewed by the House of Lords. But for the moment, as I said before, if we suppose that judgment should be in favour of the medical man, a curious anomaly will come in, that the medical man can, by his manservant, or his maidservant, or his ass, or anything that is his, sell poisons and the registered chemist and druggist cannot. So much for the law, gentlemen, and the difficulties of having to enforce an Act of Parliament. I now beg to put the resolution, and I hope Mr. Atkinson will not consider me discourteous if I do not reply to some of his observations. It is always very pleasing to hear him make a speech, and I am always glad when somebody does tread on the tail of my coat occasionally. It is only fair to say that the President of the Pharmaceutical Society is never afraid of being criticised on what he says, as long as what he is reported as saying is what he said; but there are times when he has credit given him for what he did not say.

The motion for the adoption of the report was then put and carried unanimously.

### MOTION BY MR. ROBINSON.

The PRESIDENT: I will now ask Mr. Robinson to move the resolution which stands in his name.

MR. ROBINSON: I do not propose in moving the resolution which stands in my name to follow the example of that dramatic author now living, who, when called before the curtains to return thanks for the success of his play, took occasion to say that he knew it was a good one because he wrote it himself. It is true I wrote the resolution that stands in my name myself, but I propose to leave its acceptance or rejection to the assembly who will say whether they think it a good one or not. I should like also to say, in the first words that I have to say on the subject, that I had no idea that this question was going to excite such attention as it appears to have aroused during the last week or two, and I should like to say how it came about. I am bound to confess to you it is not a new resolution before you to-day; it has been submitted to another body, which you know of probably, and received approval; but it reminds me of the case you probably are very familiar with if you are in the habit of reading the classics, reported of a man who had been absent from Athens a whole year, who, when he returned, complained that he found Socrates saying exactly the same things he had been saying the year before. Socrates said that was true, the reason being that as yet his words had not had the desired effect, and therefore it was necessary to keep on repeating them until they had. I will not draw the comparison any further, although I submitted the resolution on the previous occasion, and I have an idea the Council was not unwilling to have it again discussed here to-day. Let me go step by step and explain the matter as far as I am concerned. The Council has recently adopted the draft amendments to the Pharmacy Acts; in due course they came before the Western Chemists' Association of London, and they invited a discussion on the subject. I had the pleasure of moving there a similar resolution to this. In the main we cordially agreed with the policy of the Council, and I thought at that time the Bill was so simple and non-contentious that it would be accepted without much change or alteration or difficulty of any kind; but at the same time I did see in clause 3 that there were some words that I thought unnecessary and unwise. I do not believe yet that the Council, at any rate this year, has paid great attention to that point, or that those words are the outcome of its settled policy. I believe the words limiting the number of chemists and druggists to be on the Council at one time to ten has not been substantially considered this year. In fact, a member of the Council told me so. It has been considered previously, but this year, as far as the draft amendment Bill is concerned, the clause was merely put in, in the same form it had two or three years ago. That I believe to be the case. It was also represented to me by a member of the Council that, when the Council knew that any considerable number of persons thought that this limitation was unwise, he did not think the Council would attach great importance to it, or insist upon it; and very likely, on the matter being brought to their notice, it would go through without any difficulty. The next step, I saw, was that this resolution was sent to the Council. I saw that it appeared to meet with some disapproval from some of my respected and excellent friends on the Council, and that such opposition resulted in the resolution sent from the Western Association not being taken up by the Council. But neither was it rejected, but they deliberately took a course which, as I understand it, threw it on this meeting to decide what it would wish. They did not deal with it there and then, but left the matter in suspense, as one gentleman said, to give an opportunity to anyone who chose to come to the annual meeting and have it re-discussed. Therefore on that, although I was just going away for a holiday, I put my notice of motion down. I want to say at the outset that I am not here to endeavour to cause ruin or schism in the affairs of the Pharmaceutical Society. I do not think the heavens will fall, whichever party carries the day, but on the balance of advantage, and expediency, and justice I hope to be able to show this Council that there is something to be said from my point of view. Now just let me refer for a minute to the figures. There are 1638 pharmaceutical chemists belonging to the Society, and no more, and 3174 chemists and druggists connected with the Society, making a total of 4812. Then there are 811 students, making a grand total of 5623 persons belonging to the Society. There are only 9000—not 13,000, as our friend said just now—who do not belong to the Society.

Mr. GILES: Are you right in those figures?

Mr. ROBINSON: If the Registrar is.

Mr. GILES: I am taking the Register. Would you mind repeating them?

Mr. ROBINSON: There are 2336 pharmaceutical chemists, of whom only 1638 belong to the Society. I want to show that out of a total number of 14,798 persons on the Register altogether, 5623 belong to the Society, and 9175 do not belong to the Society. That is the point I wish to make plain. From that, when I began to read this clause 3 to the Western Chemists' Association, I naturally asked myself, What is the necessity for this limitation? And the more I looked at it the more I came to the conclusion there was no such necessity, and therefore I move the resolution we are now considering. Now, at the Council, as I read, and I have heard from others, two arguments were put forward. An honourable member of the Council said that the Pharmaceutical Society was intended for the advancement of chemistry and pharmacy, and that those most likely to advance it were the most advanced in chemistry and pharmacy. Then I know an idea was put forward that it might be doing something dangerous, something of the nature of a revolution instead of a reformation if you admitted those who are now chemists and druggists as members of the Society, and let them come in without restriction as members of Council. That is one argument I know I have to meet; but is it likely that the new men, if they were to be admitted without restriction, would cause a revolution, or do anything dangerous or derogatory to the Society? I want to ask those friends of mine on the Council who think there is a danger of anything of that kind, to consider it a little more carefully. I have heard it expressed in this way, that these chemists and druggists might go on in such numbers that they would proceed to reduce the standard of examinations, and that was a danger to guard against; that it was necessary the examinations should be kept up to the high standard. Now I will ask any honourable councillor if up to the present they consider the Council has striven to keep up a high standard of education, and to hold aloft the banner of chemistry in a proper manner. I imagine there can be only one answer: that there has been no tendency on the part of the gentlemen sent to the Council in any way to reduce the standard of examinations, or lower the high position which chemistry and pharmacy has attained. Then if we are agreed about that, I would ask them who sent them on the Council in past years, and if they will kindly bear in mind that they have gone there by the votes of a preponderating number of chemists and druggists, and in no single instance that I know of is it recorded has any number of chemists and druggists united together to send a man to the Council to say he would like to reduce the quality of the examination? Rather than reduce the quality of the examination I thought we were all agreed that it was to be increased and stiffened, and that it had been increased and stiffened. Has not the Preliminary examination been made more difficult, with the assent of everybody, because they felt that it would be kinder to let a young man know what kind of examination he would have to face in future? Has not the Minor been increased in stringency? Have you not again increased the fee until you have made the Minor fee the Major fee of five guineas? Who can say there has been any demand for reducing the standard of qualification? and, indeed, I would invite those councillors who take that view to consider the logic of the thing. It comes to this, that chemists and druggists who may have been admitted on the Council in an unlimited number, in the majority having possessed the Minor qualification, are deliberately going to reduce the nature of that examination. What for? To bring more people into the business to compete with them, and take from them their living. I cannot imagine such a thing. I do not see why chemists and druggists, if on the Council, in whatever numbers, will proceed to reduce the stringency of the examination, the only effect of which would be that a larger number would come in to compete with them in their business. There is no indication in the past, there is nothing in the present, and I can see no probability in the future, of any such thing taking place. That is the view I take of it. If anybody thinks differently, I ask them do they remember what the actual facts are? Do they know that at the present moment there are 4600 with the right of becoming members of the Society and so coming on to the Council to the proportion of seven at the present time, and a very few —only 600 out of those 4600—have come forward and joined the Society. I say, therefore, that any idea of combination of that kind is, to my mind, absurd. Another argument is that it might be possible that some of these large companies or syndicates, or whatever they might be called, might use their money and influence to send men to the Council for some object of their own. I never heard of such a thing being suggested, but they could do it, by the way, with regard to the Major men as well as the Minor. But suppose even the attempt were made. First of all you must recollect that you have in the pharmaceutical camp 3000 loyal men who have been supporting the Society for years, who would be dead against any class of men coming on to the Council to obey the behests of trading communities and cutting men, and those who are desiring to lower the character of the examination in any such way as that, so that I cannot conced for a moment that it would be possible. The I do not like the idea that there are two camps i pharmacy. I do not recognise that in the one cam there are the Minor men, and in the other the Major Surely it is your object, if I understand rightly, t draw closely together all men who are willing to com to the Society? Then there is another importa point. What is the legal position of a pharmaceutic chemist? It seems to me that some men have a idea that pharmaceutical chemists correspond in som degree to the House of Lords. There are some point of resemblance, and I might just touch upon the In the first place they have their title, which nobod can take away from them; in the next place, the superior learning, which no one wishes to take fro them; the third point is, that there are fewer them. I do not know whether you would like t comparison to be pushed a little further? There w a motion made in the House of Commons lately, th when Her Majesty chose to confer honours on one, she should also be pleased to state t reasons, so that when a great soldier was a lord she should state how many men he had kill when a statesman was made a lord it should be sta how many boroughs he had corrupted; whe brewer was made a lord, how many barrels of he had brewed. I do not know when a man is a pharmaceutical chemist whether he should be requested to state how many pills he had made, or how many times he had been pilled in the process. But, seriously, I am not here to advocate or to say anything in the mildest sarcasm of which I am capable to take away anything from the position of pharmaceutical chemists. It is the right thing for men to pass the Major. I know the value of a good education to anyone too well to say anything which would tend to produce the impression that a pharmaceutical chemist does not deserve well in every way for what he has done. But in addition to that, let us see what his legal position is. I am fairly familiar with the history of pharmacy since the beginning of the century, that is to say, I have read it in the books which are before us, and have heard conversations of people who are also familiar with it, and I say this, that when this body of gentlemen in the middle of the century united themselves together and founded the Society, when they went to the Government for a Charter of Incorporation, and later on for an Act of Parliament, which has since been confirmed by the subsequent Act of 1868, I say the legal position of every man was distinctly defined, and the position of a pharmaceutical chemist and a chemist and druggist is absolutely bound by it. The Government said in the Act of 1868 there shall be two grades of men, the higher grade who pass the Major examination, who shall be the pharmaceutical chemists, and another grade, the qualified chemist, a man who shall be called a chemist and druggist. I say both of those men have an exactly equal right in the eye of the law, the only difference being that the pharmaceutical chemist has the title and the right to exemption from jury service. Those are the only two points he has. I repudiate entirely the notion that, because a man passes the Major examination and is a pharmaceutical chemist, he is of such a nature and has such a superior hold on the Society that everything must give way to him. I say nothing of the kind, and I should be glad if anybody will show me there is anything else in the legal point of view. I do not wish to take at all from the position of the pharmaceutical chemist, but I say the Minor man has as much right as the Major man to all the benefits of the Society, except the title and the exemption from jury service. Nay, I am not sure he has not more, in this way, that there are more of them. They contribute more money to the funds of the Society. The chemists and druggists have helped to build up this splendid building and this splendid work we have here in a greater degree than the pharmaceutical chemists. The pharmaceutical chemist has contributed his £1600, and the chemist and druggist his £3100 per annum for some time. But then there are other considerations which made me move in the matter. I have always understood that hitherto you have had some little difficulty in getting men to accept seats on your Council who are the most useful and acceptable. You have been restricted by having to have pharmaceutical chemists. A man must have leisure and the opportunity and liking for it, and you have had some little difficulty, I understood, in getting quite the right men always on the Council. It struck me, therefore, is it wise to propose a further limitation? And I cannot for a moment see that it is. Do you know that the pharmaceutical chemists are decreasing in numbers, and that during the past five years we have had a loss of twenty-seven members? There are twenty-seven fewer now than there were five years ago, and the chemists and druggists are increasing in an enormous ratio. They have gained about 418 in the last five years. Then why should you go to Parliament and deliberately put words in an Act which are not absolutely necessary? I have, it so happens, during the past few years had the opportunity of drafting clauses in two Bills which have since become Acts of Parliament, under the advice of a parliamentary barrister, and the first thing he taught me was, we will have no words in which are not absolutely necessary. On that ground I say, as limiting the number of chemists and druggists on the Council is not necessary, therefore in my opinion it is unwise. From what I have read, and nobody is able to read everything on the subject, it appears that some pharmaceutical chemists want to be styled Fellows of the Society, and some do not. All these matters of detail I do not go into. I am fixing my mind firmly on doing something which is to help to consolidate the Society, and I firmly believe that is what the Council wants in this Bill, and I believe it will be sufficient if I can show that it is unwise to place this limit, and that it will not be necessary to go into all the other questions which naturally spring to one's mind in considering this matter. I do state most unhesitatingly that I do not think the pharmaceutical chemist should assume to himself the superior position that some of them—I think it must be only a few—seem inclined to do. You remember the noble lord who was boasting to his tenant of his great ancestry, how they came over with William the Conqueror, and you remember the reply of the tenant—I have always understood he was a Yorkshireman—"Aye, and p'raps he foind moine here when he coom." I think there is something in that. No doubt in 1840, when the pharmaceutical chemists were brought into existence, the chemists and druggists were settled on the land, and they are not to be dispossessed, it seems to me, in the way that some of my pharmaceutical friends would like to do it. A great point is made about the men who would stand up for a high standard of qualification, but the sting is taken out of that question by the very fact that Mr. Sandford—a name I can never speak or think of without affectionate regard—that Mr. Sandford told you in 1868 you could increase the stringency of the Minor examination. Of course you have done so, and the real fact is this, if I am correctly informed, that the Minor of to-day is as stringent, and as good a test of a man's capacity, as the Major was a few years ago. I am told that is so. I hear an hon. friend say "No," but he will have an opportunity of elaborating his argument presently. I am told it is so by men who have been up for both examinations. I admit that the Major has also been increased in stringency. Of course the main argument is this—that you have deliberately, with the assent of everybody, made the Minor, which is the qualifying examination, and always has been since 1868, more difficult to pass, and a better test of a man's fitness than the Major used to be, for Major men have told me so themselves. Therefore, the sting is taken out of the question. Your Government Visitor tells you the examination is satisfactory, that you are bringing up a class of men well qualified to conduct the business in every way. I cannot see the great distinction between the Minor man and the Major—I mean because it often arises from accidental circumstances. I know the case of a clergyman whose son is a chemist, and when he passed the Minor he said to him: "I cannot afford for you to go any further, it will cost another £100 to go in for the Major, and you must be content with the Minor." There are dozens of such cases. Sometimes it is said men go up for the Major without being prepared. In my case I prepared myself, but I never went up for it. I quite admit there is no credit due to me for that. It was an accidental circumstance, the death of my master, which immediately threw me into business, and I never had the opportunity of going in for the Major examination, but I have advised and helped others to do so since, and I quite recognise that it is the right thing to do. But what

I want my Major friends to see is, that there is not this great difference between the Major and Minor men. What is the difference? The Major man is the Minor man plus in some cases twelve months, in some cases six months, in some cases three months, in some cases six weeks more pharmaceutical education. He has no more general education, no more knowledge of the higher mathematics or classics or anything of the kind, but just a further touch of the knowledge of pharmacy. It seems that the rejections at the present moment at the Major examination are no less than 55 per cent. I cannot bring myself to think that the moment a young man presents himself for the Major and gets through he thereby becomes a very different being, a very superior article to the Minor man. I do not believe it for a moment. It has often been said that people do not care to join the Pharmaceutical Society. One has the advantage in London of mixing with a large number of people, both wholesale and retail, and I have heard a great many reasons given for this. Some think they are too good for the Society, that it is only a mere clique. Others think that the Society is too good for them. I have ventured to tell both those classes that I thought they were wrong. I think the least we can do when we are connected with a business by which we earn our living is to take an interest in it, and if we think it is wrong to endeavour to amend it, and not to hold aloof. I have always taken that view. If I am to be quite candid I ought to confess probably that the turn of my mind is more to imperial and perhaps maritime matters than pharmaceutical, but, to use the phrase which has now become classic, let me nail that lie to the counter before it becomes current. Do not let it be thought that I am indifferent to pharmaceutical affairs. No; if we are to take an interest in things we must not be afraid of stating our opinion, and my opinion is that the only way to promote the interests of pharmacy and of the Pharmaceutical Society is to widen and broaden and deepen the basis on which it rests, and the best way to do that is to show some—I will not call it consideration—but some common business faculty in dealing with the problem we have before us. One gentleman wrote to the papers a letter in which he said something about sentimental generosity. I may have something to say before I finish with regard to that letter, but in passing I cannot see any sentimental generosity on the part of pharmaceutical chemists, or anything of the kind. I am afraid I am taking up too much of your time, but there is one matter I have not referred to. Another argument I have heard, as well as the one that those who are educated in the highest degree in pharmacy are most likely to serve it, was the statement made by the President that when he went to the country some two or three years ago he found no strong desire for a change. I venture to say that when he made those self-denying efforts of his, and in my opinion he is about the only man possessing the necessary eloquence, energy, capacity, and knowledge to undertake such a trip—when he went on such a laudable errand all over the country, was it quite impossible that those efforts should have some effect? I think it very likely that they had, and that the President, although he could not see the result there and then, did arouse some enthusiasm, and the desire in some to associate themselves with the Society who otherwise would not. Do not we know that there is an idea floating about in the minds of some even now that they are almost thinking of forming another kind of federation? What is the idea at the bottom of that? Is it that they think they can be useful in some way to the business or calling by which they get their living? I think it is very foolish to start another society or federation, that we ought to stick loyally to the Pharmaceutical Society, which is the only one with any legal status, and is, I think, the only one having the necessary cohesion to exist, but still it shows that there are many more willing to unite themselves together to promote the best interests of pharmacy, and therefore I am anxious when you are inviting them to come forward that we should not meet them at the door saying, "Only ten of you, please; the rest of you we do not want on the Council." I can see no danger which can arise in any way from removing all such limitations. You do not propose to say that pharmaceutical chemists shall be limited to eleven, only that the chemists and druggists shall be limited to ten. Why do not you take the other view? I propose to show that really instead of any sentimental generosity the boot is going to be on the other leg. The number of pharmaceutical chemists is 1638, and they ought, few as they are, to have full representation on the Council, but they ought to be in the same proportion. You are taking the same fees of the chemist and druggist, who in the eyes of the law has as much right to the Society as anybody; the only thing he has not a right to is the title and the exemption from jury service. The exact proportion of pharmaceutical chemists, if you talk about strict justice, would be the same proportion that 1638 bears to 3174, and if you apply that principle you would find that there ought to be seven pharmaceutical chemists and fourteen chemists and druggists on the Council. Then someone talks about sentimental generosity. I always understood those who received the benefit of a higher education ought to remember the motto *noblesse oblige*. I do not see any sentimental generosity; I do not see much of the higher qualities which superior education is supposed to give; I mean calmly assuming when in a minority, a great minority as far as numbers are concerned, that he should still retain the majority of representation on the Council. Taxation and representation should go together. I should be perfectly in order then were I to move a resolution to the effect that there should be seven pharmaceutical chemists and fourteen chemists and druggists. I might be able to show some reason for it. I may be asked, am I going to do so? No, I am not. Why? For the same reason I want to take these words out of clause 3. Why restrict yourself at all? Why not send the best men? It is absurd to say you shall have ten chemists and druggists. It is an ear-marking unworthy of the pharmaceutical Council, and I am very much surprised that men of light and leading, as the pharmaceutical Council are, should not see this themselves. I was in the company of four chemists lately, one of whom said to me, "I have not the least doubt that the fact that the Act only allows seven men to go on the Council has prevented even seven men coming forward. Men are not coming forward to be ear-marked in such a manner as that, and I am not surprised at it." Do you know what is going on in the country? There are many men of great capacity in the country, such as justices of the peace, mayors, councillors, and so on, who are doing good work in their respective positions, men who are not pharmaceutical chemists, and there is a case in my native town which I might bring forward as an example, and if there is one in my town there must be many in others. But in my native town in Yorkshire, a gentleman who was in business before 1868 as a chemist and druggist has held the chief offices there for years. He is a county councillor, and he was made lay rector and took the tithes, and dined with the archbishop once a month. If there had been twenty-one pharmaceutical chemists in that town, not one of these gentlemen would have had the chance of filling offices which my friend has held. And why is that? Because he is a business man; he is a man of great experience, and a wealthy man (though that should not be reckoned), but there he is, far superior to any twenty-one pharmaceutical chemists that you could bring on the scene. I know plenty of men who say they will not have anything to do with pharmaceutical chemists. I do not take that view. I want to fuse these things together. There is a case in my neighbourhood which I might mention of two sons of a man belonging to the Society; one is a pharmaceutical chemist, and the other is not. I do not say that one is a wise man and the other is not, but it is quite the right thing to do for a man's own sake that he should get the title—and if the Government is going to give positions they may give them to pharmaceutical chemists—but he should not seek to efface the man who has not passed the Major examination; at any rate, that is the view which presents itself to me. Now, without further remark, I will sum up the conclusions I have come to. I think that those men on the Council who desire to retain this clause—this ear-marking of chemists and druggists—will be pursuing a narrow and a short-sighted policy. I regret to say they are pursuing a selfish and an unjust policy. If you are in earnest to consolidate the trade you must stoop to do it, but stoop honourably. There are men who will not come on the Council under the conditions proposed, as they would have to sit below the salt, or something of that kind. I do not mean that they would be subject to any disagreeableness, but the mere fact that they would always be in a minority would operate in the same way as it has operated since 1868. If I am beaten here to-day, which I do not think I shall be, it seems to me you will be throwing yourselves in the same position as in 1868. Mr. Sandford told you then that it was an unwise thing to keep the Minor men from membership of the Society. Pharmaceutical chemists were afraid of it. But what is there to be afraid of? I cannot imagine what it is. To suppose that the 3000 chemists and druggists are going to take anything from the Society is absurd. There is one argument which I must meet; I am told that if all chemists and druggists were like me you would not be afraid. But I am an average man. I do not think there is the slightest fear of any one attempting to come on the Council of the Society with a view of doing anything unworthy, and if they did what would happen? You would immediately have an enormous preponderance of men who would not allow them to act; besides which, the Privy Council would not allow the examination to be held. You have on the one hand the narrow, selfish, and restricted policy, and upon the other the more open and statesmanlike policy; but above all it is a more just policy. I appeal to the members of the Pharmaceutical Society who have held up a high standard of honour and justice to say, Where is the justice of telling 3000 men that they shall be in a minority of representation? Look at it from another point of view. Up to now you know that 4600 men were entitled to be made members of the Society as having been in business before 1868, but of that number only 600 have been made members, and you now invite 3000 men to come in as members of the Society, and you say we will give you three more representatives than the 600 have. Is it not extraordinary? My friend who wrote to the Journal and talkod about "sentimental generosity" should consider that. Now, to sum up the matter, I desire earnestly that those members who may have come here with the idea that my resolution to omit the words was dangerous, should think it over. Where is the danger to come in? Who is going to injure the Pharmaceutical Society? I will read a letter from a friend of mine, Mr. Savage, of Brighton, who writes as follows:—"I see that it is your intention to propose a resolution. I quite concur with you, that there should be no such limit. When the original proposition came before the Council I proposed the adopted number of seven chemists and druggists, but the result has been, with few exceptions, the selection of pharmaceutical chemists only. The fixed number is quite unnecessary." Where is the necessity to have a fixed number? Why should you deliberately shut yourselves out from the choice of men whom you might think the best men? Suppose the decrease goes on in pharmaceutical chemists, you might have a more limited choice. They are decreasing at the rate of twenty-seven for every five years, and you may find yourselves more restricted in ten years. Desiring the consolidation of the Society, and knowing as I do that the effort will not be altogether successful so far, but desiring that the Council should take a step in the right direction, I venture to say that it will be a most unwise, foolish, and unjust thing for pharmaceutical chemists to insist that those members whom you ask to come in shall only be represented to the extent of ten. I humbly beg to move the following resolution which is standing in my name:—

> "That this meeting cordially approves the draft Pharmacy Act Amendment Bill recently adopted by the Council, with the exception of the words in clause 3 limiting the number of representatives on the Council, of members who are not on the Register of Pharmaceutical Chemists, being strongly of opinion that any limitation of equality of representation would injuriously affect that unity it is so desirable to promote. This meeting is therefore of opinion that no such limitation should be placed upon any qualified member of the Society being elected to the Council."

Mr. Ekin: Upon a point of order may I make one observation? Mr. Robinson made use of the words, "Deciding this question." Is it competent for the meeting to decide the question? At the most, I take it that it can be but a recommendation to the Council.

The President: It can only be a recommendation to the Council.

Mr. Urwick: I beg to second the motion, but I am willing to give way to any other gentleman who would like to second it, because he might more eloquently support it than I can. But I support it in the interest of the Pharmaceutical Society, and, thinking the Society should be elevated, I do not wish to lower the standard of education, or anything of that kind, but it is with the view that we may have more men to fight the battles that will be coming upon us. At the present time we are but a very small representative body to go to Parliament for enactments of any kind. If we can do anything to bring the others in it would be a step in the right direction, and for that reason I most cordially support the resolution which has been moved by Mr. Robinson. I think it would be unjust and unfair to invite men to come and help us—and we must have their help to carry any legislative measure—and on the very threshold to say that you shall only have the voting power that the others have. They are greater in number, and I do not suppose for one moment that if all chemists and druggists were on the Council pharmacy would suffer thereby. You may take almost any instance of men that go forward—men, I mean, of levelling disposition, and let them once get into office. Directly they are there they like to maintain their dignity and uphold the office, whatever it be, even if it is in wrong-doing. That is my experience of life so far as I know, that when you once put levellers into position they become truly conservative. Some persons have raised the question of difference of title, but to my mind the public draw no distinction between pharmaceutical chemists and members of the Pharmaceutical Society. Some think that "Member of the Pharmaceutical Society" stands higher than "Pharmaceutical Chemist." That is the point at which they arrive, but an argument easily puts them right upon that. Anyhow, that is the feeling amongst the public. At the present day I do not know that the public care one pin about the qualification of the chemist, they only go where they can get things cheap. Therefore, I think that if you can have some other title I should fall in with it—that is, going higher, for the higher you can train men in chemistry the greater advantage it would be, not only to the men themselves, but to the Society. My convictions upon the point are strong, and I am sure you will agree with me that I would not do anything to weaken the Society, and I know that that is the view which Mr. Robinson takes.

Mr. HYSLOP: I will not attempt to follow the mover of this resolution into the levelling mystification which he seems to employ, because I think that we should keep strictly to our subject. What argument has Mr. Robinson given for objecting (and this is the strict way of putting it) to the extension of limit that the Council may choose to insert in this Bill—what real argument has he adduced in favour of his resolution? I can see none at all, but one which is a mere idea, and that is equality of representation. Now, representation is a word—a beautiful word—but it is a word which very few people understand, and those who utter it are generally those who do not understand its meaning. It is proposed by this resolution to produce equality of representation by ignoring the rights of those who have always been foremost and most influential in pushing forward the interests of the Pharmaceutical Society. It is a new edition of the old tale of what they did in France, where they decapitated all the higher classes so as to put men on an equality. Now, what do we find in the opening lines of the Royal Charter of Incorporation, which was granted to the Society on February 18, 1843? After the usual gracious opening, it goes on: "Whereas it hath been represented to us, on the petitions of William Allen, Charles James Payne, Richard Hotham Pigeon, and others, that they, and divers other persons our loving subjects, have associated together and have formed themselves into an association called 'The Pharmaceutical Society of Great Britain,' for the purpose of advancing chemistry and pharmacy, and promoting an uniform system of education of those who should practise the same; and also for the protection of those who carry on the business of chemists and druggists; and that it is intended also to provide a fund for the relief of the distressed Members and Associates of the Society, and of their widows and orphans," and so on. I wish in the first place to draw attention to the fact that we have four objects contemplated in this Royal Charter. In the first place the object is the advancement of chemistry and pharmacy; in the next place promoting a uniform system of education of those who should practise the same; in the third place the protection of chemists and druggists, which is the very thing we have some patent before us to accomplish on the present occasion—the protection of chemists and druggists; and the next is the formation of that beneficial fund by which so many are relieved at so small an expense on our part. Now, sir, the founders of this association were not examined men; there were none to examine them, but they were successful men of business, men of probity and goodness, and though few in number—mark that—these men were the true representatives of the vast number of chemists and druggists at that time, and these men saw and said to themselves, we must move in the matter, or else pharmacy before long will be taken away from the chemists and druggists altogether—it will be placed either under the heel of the ordinary medical practitioner, or it will be subject to the vexatious interference of State control, and there will be nothing left to the chemists and druggists by and by but the merest shreds and parings. They therefore moved in the matter, and launched the Society successfully into existence. Now I want you to understand that, gentlemen. The pharmaceutical chemists of to-day are not actuated by any wish to oppose or to hinder you, but I rather think from all I have seen they are actuated by a desire to still safeguard your interests, as the founders of the Society were in days gone by. I am speaking now as a chemist and druggist—I glory in the term "chemist and druggist," and I do so for many reasons. It was my privilege to enter the Society a little while before the Act of 1868 was passed, and I remember the occasion which gave rise to that Act; indeed, during my assistantship for twenty years before that I had kept a strict eye on the proceedings of the Pharmaceutical Society through its monthly Journal and Transactions, which we then had to pay a shilling a month to get if we were not members of the Society, and I have a peculiar love for the title of "chemist and druggist," because during the whole of my apprenticeship I met with those whom we meet with now—those who discouraged one from joining the Society, but I met with none in my early days who would direct me where to go in order to become associated with it. From the discussions going on with reference to the change in the Act of 1868, I thought I must take a leap for freedom, and accordingly I at once went into business for myself, and then came to the School of Pharmacy, and having got my assistant's qualification, twelve months afterwards I went up for the Major examination. Many forget that expressive maxim, "Hasten slowly." That is a good working rule, and the point whence we can view in the distance evolution, and revolution which we never expected to occur. The second object for which the Society was inaugurated and founded was to promote "an uniform system of education of those who practise the same." Now, sir, the education of those days through which men had to pass did not mean "cram"—moving in an atmosphere of puffy pretension; it did not mean that; it had not the popular meaning which it has in the present day, but education meant then solid, hard, level work, which would afterwards bear any amount of polishing and knocking about. Education was understood in its proper sense as the educing and systematising a man's faculties so that in after life they might be applied to the calling to which they were intended to be devoted. The third object for which the Society was founded was for the protection of chemists and druggists, and chemists and druggists have been protected by it all along. So you see, if for any reason whatever, however laudable or however falling short of a laudable reason, you wish to stop, remember the Pharmaceutical Society is at least your protector, and the legitimate protector of your interests, and necessarily so according to the Royal Charter of Incorporation. I think that our friends in proposing this resolution are moving on to a sort of will-o'-the-wisp that will lead them far out of the way. I believe we should have steadily before us in the future that which the main supporters of the Pharmaceutical Society had always before them a the past—namely, the desire that the distribution of medicine and drugs should be entirely in the hands of the chemists and druggists, and in the second place that there should be eventually but one name by which all members of the fraternity should be known, whether it be that of pharmaceutical chemist or that of a pharmacist, I do not mind which. I do not mind whether it is chemists and druggists, so long as there is only one way by which the medical profession, the Legislature, and the public may know us. I think in this way alone shall we be enabled to gain that end and aim which was the final aim and object of the founders, and should be of ourselves too, that medical practice in Great Britain should be restricted to the medical men, that dispensing and everything to do with drugs should be restricted to pharmacists, and the trade should be restricted to tradesmen, and that Vulcan should forge on his own anvil.

Mr. Barnard: We certainly live in a democratic time; we believe in one vote for all persons and equal rights for all men, but does this new scheme accept that broad principle? Does it give equal rights to all after the figures which have been given to us by the mover of the resolution? The Council must, I think, admit that it does not. I want to see those magic letters, "M.P.S.," have a meaning to the public. I want to see every member of the chemist and druggist business a member of the Pharmaceutical Society. I take it that that is somewhat the object of the Council in framing this Bill, to increase the number of its members. If we increase the number to that extent, and I hope we shall, that every man connected with the trade who has passed the Minor examination will become a member of the Society, then M.P.S. will have the same meaning to the public, namely, that the man who uses those letters has given proof of his ability and is entitled by law to practise pharmacy to the same extent that the magic letters M.R.C.S. gives proof of the ability and legal qualification for a man to practise surgery and medicine. The letters M.R.C.S. are recognised by the most illiterate people in the east end of London, but to the public the letters M.P.S. have no meaning at all. I ask the Major men of the Society, for the sake of unification, to do away with sentimental feelings and to be generous, as the founders of the Society were generous in 1868 to the men in business. Let them be generous to the Minor men, who have some claim upon them, the same as the founders were in 1868. Let the Major men retain the greater title. I am not a pharmaceutical chemist myself because I happened to be managing a business instead of being in business on my own account at the time of the passing of the Act. I am debarred from being a member of the Society, though some of the assistants who were then beneath me are members of the Society. I do not complain of that, but I do want to see unification, and I want the words "Pharmaceutical Chemist" to have a meaning of dignity, and to let the Major men have the exemption from jury service which Parliament has conferred upon them.

Mr. Lomas: I know it is the general opinion of the Council and of many members that the letters M.P.S. confer no degree of efficiency, but to that I demur. I say that when the public see "Member of the Royal Pharmaceutical Society" written up above a shop it means a great deal to them, and it is with the public that we have to do. There are many members who think that you are too generous in admitting associates as members, but I, for one, am willing to do everything I can, and to induce others to do the same for the good of the Society. When any body of men are going to ask for anything, their rule is to ask for a great deal more than they expect to get, and that is what the mover of this resolution, in my opinion, is doing. He knows what the Council are favourable to, and he wants to get something more. I say to you that you have nothing to do with this. The mover of the resolution quoted the number of pharmaceutical chemists connected with the Society, and he sought to throw cold water upon them; but if you do away with the limit upon the Council, what would be the upshot of it? You are taking every inducement away from men. What is to induce men to become Major men if you take everything away which is worth having? If the mover of the resolution wants to have more representation, what he has to do is to pass the Major examination, and to get all the other men to do the same. That is what Jacob Bell and the able men who were associated with him did, and I may tell you that they were far more able than any of you here. It is said that you judge men by their actions. All I can say is they did more than you are likely to do. What did they do? They said we must have the men come higher up; we see the folly of not being educated. According to the mover of this resolution there is no distinction between a B.A. and M.A., but still there is no argument in the matter, it is simple madness. You know what levelling brings us to. Look at the present House of Commons. Can you see anything worse than that? I object to the articles of association being altered as regards pharmaceutical chemists; in fact, I object to their being altered at all. Pharmaceutical chemists must preponderate; it is to them we look as the backbone of the Society. We want the Minor men to go on to the Major examination. If you consent to this levelling what would the medical profession think of you? They would say we were going to the dogs. I am not going to trouble you with any more observations except to ask you to have nothing more to do with the resolution. The proposer, and those supporting him, are trying to get something more than they ought to get, and they know they will not get it. They ask for a great deal more so as to secure something. What does the resolution mean? It means that if you pass it the capitalist will send men for seats on the Council, and where you now have one co-operative cutting store you will have dozens. Instead of being better off you will be a great deal worse off. I will just sum it up in a word. The resolution means revolution, and then follows degradation.

Mr. Warren: I believe I wrote the letter which has been already referred to, though I am not sure that I used the words "sentimental generosity," but if they were in my letter I am sorry it should be misconstrued into anything like a sort of patronising feeling. Dropping into this meeting promiscuously one would think we were taking away the vast privileges of the members, and so far as I am concerned I feel no interest whatever in fighting for any privileges of pharmaceutical chemists, unless it is proved that the maintenance of the privileges is for the good of the body generally. I would rather prefer that we should settle our own differences, as we are members of a common society, and in so doing that we should forget our privileges. I cannot help thinking that some gentlemen have an optimist tendency, they are not always safe; others are cautious, and they get abused, because although they are the safe guides in the end they are not generous enough, but I cannot help thinking that the security of this Society is best assured by having a fixed number of pharmaceutical chemists—I do not care whether it is a majority, and if the chemist and druggist members feel that the majority is unfair they will say so; but certainly I prefer to have a fixed number for the simple reason that caution comes in in this way. Now it is all plain sailing, but Mr. Robinson cannot answer that there will never be any future trouble in the world for chemists and druggists, and there is a vast majority at the present time who are not altogether in sympathy with us. Unless there is a number assured they will have the power to eject every pharmaceutical member from the Council. I believe there ought not to be a possibility of such a misfortune happening to the Society; I think that this element ought to be retained, as is an element both of stability and security for progress. We have no doubt very able and loyal supporters amongst chemists and druggists; in fact, I feel, if I may say so without being disrespectful, something like David and Goliath in more ways than one in getting up to oppose this resolution. The proposed Bill enfranchises an enormous portion of our brethren, and opens the door wider to the Council, but such is the vigour of these gentlemen that they are not content with the wider opening, the further representation, and enfranchisement of members, but they must do away with the old guard altogether. It is all very well when we have plain sailing, but why with the unknown seas before us should we throw over the baggage and helm. I think the way the proposition is stated in the amendment would be more liked if it omitted the words "no more." I know Mr. Robinson objected to the words "not more," but it seems to me in those rough old times people did not think so much of things; what they thought was right they said, and people had to pocket it; but I think it would be much better to say we have a body of men who have given us some proof of their intelligence by passing the highest examination, and we really cannot do with less of the number of these gentlemen. I think that is the politer way of saying it. I have no sympathy at all with the Major men who quibble about their rights and privileges. One right which the Major man has, and I think he ought to keep it, is the title of pharmaceutical chemist. There is one thing he has, as Mr. Robinson stated, which the Society cannot take away, and that is the knowledge which he had to acquire before attaining that position.

Mr. Wells: I would just wish to remark at the beginning of my observations that a gentleman here present, whom I am told is Mr. Lomas, must have been sleeping the sleep of Rip Van Winkle, or he certainly would not have given utterance to the very peculiar and antiquated sentiments which excited so much laughter from those present. I only hope that he will go home from here attempting to try and learn something, notwithstanding the fact that he is not now a very young man. After leaving Mr. Lomas we go to Mr. Warren, and I am not surprised at what he said, for I have occasionally read his utterances in the *Pharm. Journal*. He has repeated them here, and I hope they will be taken for what they are worth. I have come here as a very old chemist, and as one of the founders of the Society, to support gentlemen with whom I should not as a rule agree when we are associated together in other places; but upon this occasion I have put myself to a great deal of inconvenience to afford myself the pleasure of supporting Mr. Robinson in the hope that he may carry his motion. Now, sir, I have occasionally read (and what I have not read I am sure is repeated at the meetings of the Council) the jeremiad they are constantly uttering about those who are outside the Society, and will not go into it. They whistle, but who comes to their call? We know for a positive fact that the majority of chemists (I will not draw any distinction) in England are not members of the Pharmaceutical Society. Now, granting that fact (and I believe that it is a truth which cannot be refuted), what do you offer them? The privilege of joining the Society upon paying a guinea a year. That is all. They ask you for bread, and what do you offer them? A stone. You offer them nothing. Sir, that is my opinion for what it is worth, and I back my opinion, having given utterance to it, although it may not agree with the opinion of others. The Council of the Society is seeking for some means to bring the sheep into the fold. I think I remember in my young days listening to a sweet voice or two which, when accompanied by music, said "Teach me how to woo thee." Mr. Robinson has been teaching the members of the Council, and some of the Pharmaceutical Society—principally the members of the Pharmaceutical Society—how to woo the sheep back to the fold. You can only do so by offering them some inducement. That inducement is the privilege (if it is a privilege) of being on the Council. I attempted it once—at the earnest solicitation of my friends, not at my own wish—and failed, and having failed, I can only say that, looking at the proceedings of the Council, which I frequently hear in this room complained of, I can only congratulate myself that I was not a member of the body whose actions (if I may call them actions) were confined simply to words. I will gladly sit down presently, but surely these things are fair matters for criticism. What do we come here for once a year except it is to give utterance to our views and convictions about those who, I say, are supposed to represent us, because I do not consider that the Council as constituted does represent the chemists of Great Britain.

The President: Might I suggest that you should argue the point which is now before us? We have already passed the report, and you are speaking now very generally. I understood that you were supporting Mr. Robinson's proposition, though up to the present you have not adduced any argument on that subject.

Mr. Wells: The ultimate object of Mr. Robinson's resolution is to endeavour to induce those outside the Society to join the Society.

The President: That is the object of the Bill proposed by the Council.

Mr. Wells: Then I say that the Bill contains one clause which is fatal to that object. You must throw open the Council to every chemist who is a member of the Society, and until you do that, so long you are victims of a selfish and narrow-minded policy.

Mr. Lomas: No.

Mr. Wells: That, sir, is my opinion, and I may say that I did not interrupt my Rip Van Winkle friend, I did not even laugh at him—I could not because I was sorry for him. Until you can offer some inducements to the chemists of Great Britain to come and join you—and you do not offer the slightest inducement at all, in my opinion—and they can feel that there is a possibility of sitting in the chair which you occupy, all I can say is that all the bills in Parliament will never consolidate and bring into one fold the chemists of Great Britain. Therefore, I do beg and entreat you to alter your policy, because if you do not the Pharmaceutical Society will drag itself wearily along as it has for so many years, and instead of advancing it will be more likely to retrograde.

Mr. Lomas: I think, Mr. President, that I have a right to reply to the observations of the last speaker.

The President: No, sir.

Mr. Atkinson: The observations which I shall make will be very brief, as the proposal now made seems to be on identical lines with the recommendation I addressed to the Council some years ago. There are some gentlemen who say "If this is the full extent of your proposal, it is scarcely worth while going to Parliament," and they give it a weak-kneed kind of support. I think gentlemen who have adopted this attitude have given a very perfunctory consideration to the question, or are they or not aware of the enormous amount of opposition there has always been to every attempt at pharmaceutical legislation? I doubt whether the President himself even is aware of the full extent of that opposition. I remember when the last Pharmacy Act was before Parliament, and but for an accident would have passed, when I called on an M.P. he held up six or seven letters, every one of which contained a petition against the Act, and these letters came from totally different districts, the objections being based on something which was entirely distinct. Now a little consideration would show that this is just what is likely to happen here. The 4000 persons within the pale of the Society have some organisation, and consequently may be expected to act energetically for their own advantage. Mr. Robinson says there are 9000 outside—I thought there were more—and these are without any organisation whatever; they have no means of communicating their respective ideas to each other, the consequence of which will be that whenever you have a bill before Parliament they will act in small bodies. The proposal we have from the Council I believe to be the only wise and statesmanlike policy which it is possible to adopt. It is not a question of what you would like to have, but what you have a chance of getting. It is the only proposal which affords any hope for the federation of pharmacy, and in that hope I shall endeavour to do the best I can in its service. With regard to Mr. Robinson's resolution, he has had something to say about generosity. Now, there are only 1400 pharmaceutical chemists——

Mr. Robinson: 1638.

Mr. Atkinson: I am speaking of pharmaceutical chemists.

Mr. Robinson: If you would like to know the numbers I will tell you. There are 2236 pharmaceutical chemists, of whom 1638 belong to the Society.

Mr. Atkinson: There are 1406 pharmaceutical chemists.

Mr. Robinson: And 232 life members.

Mr. Atkinson: Mr. Robinson does not seem to have any respect for the representation of the minority. The pharmaceutical chemists, whatever you may say to the contrary, have established the Society, they have built it up, and the bulk of the money has come out of their pocket. What does Mr. Robinson ask you to do? He asks you practically to efface yourselves. What would be the constitution of the Council that would be elected if you adopted Mr. Robinson's resolution? There are 1638 pharmaceutical chemists, and you propose to extend the election franchise to how many?

· The President: Ten thousand.

Mr. Atkinson: For every vote to a pharmaceutical chemist who was a candidate for the Council the chemist and druggist would have seven or eight. Then we are asked to substitute for the words "pharmaceutical chemist" the words "chemist and druggist." And yet you talk of sentimental generosity.

Mr. Giles: I hope that old associations will justify my taking part in this discussion. I should like, before I say anything further, to pay a tribute of great respect to the able way in which this matter has been introduced. A good deal has been said which is rather beside the main issue. I look upon it as a practical question, and not as a sentimental question. I do not think Mr. Robinson mis-stated anything intentionally, but he a little misled us as to what was the intelligent signification of the figures which he quoted. I happened, quite by accident, having a Calendar for 1883, to have taken out the number of the several classes of members in 1883 and at the present time, 1893. Mr. Robinson has told us that in the last five years (which is not quite the same thing as ten years) there has been a diminution in the number of pharmaceutical chemist members, and an increase in the others; but just consider what that means. The pharmaceutical chemist members originally were persons who came in without qualification—that was in 1841—and that accounts for a considerable diminution. But let me call your attention to what I consider are the pertinent facts about these members. In 1883 there were 1118 Major examinees out of 1850 pharmaceutical members. In 1893 there are 1330 Major examinees out of the diminished number of 1638 pharmaceutical chemist members. It is evident that this is a growing body. Look at the striking contrast which is exhibited when you look at the chemist and druggist side. In 1883 the chemists and druggists were 830, and the number of Minor examinees were 24. In 1893 the chemist and druggist members were 647, a diminution of 200, and the Minor examinees were 18. What does that tell us? We can see on the one hand with what object the pharmaceutical chemist members came into the Society. It was to build up the Society, to create the Society, and they are the backbone of the Society. And for what reason did the chemist and druggist members come in? To escape examination, and to get privileges which they otherwise would not have had. Are we to throw over the pharmaceutical element, so tried and solid as it has been, and to give the preponderance of voting power to those who have shown nothing but a selfish interest in coming into the Society? I have not read the number of associates in business, for I was under a misunderstanding until I came here and heard Mr. Robinson. I thought they were not members, and entitled to vote. Now as to the *ad captandum* argument as to justice and equity and fair play all round. Every member will have an equal voting power, and I quite agree that if there was only one class of member they should have equal privileges in every direction, but when you have two different classes it is by no means an unusual thing to define in what proportions they should return members to the governing body. Now a gentleman upon the other side has made an observation which he did not follow out to quite the extent to which it is capable, as to the distinction between M.A. and B.A. of the Universities. There is just this difference. The M.A. has a vote on University matters, and the B.A. has not. Nevertheless, there is no difference in their qualification. It is a mere form in proceeding from B.A. to M.A. Mr. Robinson admits that he desires to have the best men on the Council. Who are the best men, and how are we to find them? I grant that examination is not an infallible test; it does not select all the sheep on the one side and the goats on the other, but it is the only test we have. What do we want a Council for? Is it to exalt the self-conceit of individual men, or to carry on the business in the best interests of all its members. I do sincerely think that whatever may come hereafter — and I hope it may come in my lifetime—that I may live to see but one qualification for members; but at the present time we are in a state of transition, and therefore I would urge upon you not to go too fast. Do not ride faster than one's horse. It will settle itself if left alone, as most things do. I think this is a question where a great deal is due to our Council, for they no doubt have given more consideration to it than we have been able to do, and they have arrived at a conclusion which—without saying anything about sentimental generosity — I think was liberal. In extending the number of representative members of what without any disrespect I may call the inferior grade, from seven to ten, I think you have done all that might be reasonably expected of you, as you have given them the opportunity of electing a practical council, and, it may be, even being in the majority. I do think it is only a matter of grace and courtesy that in a question of this kind, which we are all agreed may not work any material mischief, we should follow your guidance and put our confidence in you. It may not do any serious mischief, but it may do some. It would be a misfortune if the Council were inundated with members who had not the qualification which it is desirable a member should have. If you do not wish to run any peril, I would urge you not to give the power to enable that to be done. If there is a doubt about the matter, for goodness sake let us avoid the danger.

Mr. **Campkin**: I should not have risen after the protracted debate had it not been for this, that I consider the gentleman who has just resumed his seat has done an injustice to chemists and druggists. I am certain that they were actuated by no such motive as he suggests; they were men who were in business previous to the passing of the Act, and in order that an inconvenience should not be perpetrated, they were allowed to be registered as chemists and druggists, and, thanks to the generosity of the Pharmaceutical Society, to be admitted as members thereof. In that position they are placed on the same footing as were the pharmaceutical chemists previous to 1853, and therefore there is no distinction of the character alluded to by the gentleman who has just resumed his seat. I take it that the large majority of those present are metropolitan members, and possibly are not subjected to the same inconvenience as those of us who live at remote distances from the centre—namely, in the country districts, who are entitled to some amount of consideration. There is one thing to be said with regard to those members who have been spoken of so slightingly, that at all events they did give evidence of their experience, and after all it is experience that makes us wise, whatever may be said to the contrary; because the high examination also produces evidence of experience in some directions. I think, therefore, the gentleman will see that he has—it may be unwittingly—spoken disrespectfully of a class of men who, after all, by Act of Parliament rank equally with pharmaceutical chemists. With reference to the proposition of Mr. Robinson, I have heard the arguments on both sides, and personally I do feel that there is a great deal to be said in favour of those who have been privileged, by circumstances which have been within their own range, to become pharmaceutical chemists. Some of us are not in that position, and it has been through prejudice in our earlier career. Unfortunately for myself, the gentleman with whom I was articled had a strong prejudice against the Pharmaceutical Society, and was an active member of the old United Society. You, sir, will remember when the two bodies came into conflict. Previous to 1868 it was considered equally as important amongst the rank and file in the country districts to be a member of the United Society as to be a member of the Pharmaceutical Society, and had I followed the wish of my parents and others I might have been affiliated with this Society, having been in business previous to the passing of the Act, and consequently I was one of those who could take advantage of that Act. It would have been my desire to have passed on to the higher education in connection with the Society; but this is totally beside the question. Still, I think you will feel that an explanation of this kind is not out of place. I have had some knowledge for years past of chemists in various parts of the country, and it has been a matter of surprise to me, as I have come into contact with pharmaceutical chemists, to find that still there are a number outside the Society. This I could not conceive possible, but it is a fact. With regard to the Bill, I have heard many opinions expressed in many places, and although the general opinion is in favour of the Bill, still it is considered so modest in its pretensions that it is thought, like the charity boy, to be hardly worth going through so much to get so little. A great deal more is expected by the members inside the pale of the Society, but it is welcomed by many, and we must consider that all legislation must be gradual, and that there must be a considerable amount of compromise. When we come to compromise we may meet on one common basis, in order that there should be some legislation for the benefit of the Society generally, to make it more inclusive than it at present is. In all efforts of legislation it will be perfectly useless to expect any practical Act unless we are united and unanimous. The first question that will be asked will be, does your Society represent the majority of the trade? If not, all attempts at legislation would be abortive. At this late period of the Session there is but very little prospect of getting even this modest Bill passed into law. It will become a question whether it is not worth while after the discussion which has taken place to-day to take it back to the calm atmosphere of the council chamber and to see if further modification can be made. With reference to the proposal of Mr. Robinson I cannot say that I am entirely in favour of it, because of the special regard that I have for those who were, so to speak, the founders of the Society—the pharmaceutical chemists' body—but you have this to consider, that they are, perhaps, a diminishing quantity. The chemists and druggists, pure and simple, are undoubtedly a diminishing body, whereas the associate members are becoming more and more numerous, and in due time will overwhelm the others because of the difficulties in a pecuniary sense which attend the curriculum, in connection, it may be, with the Major examination, as the Minor examination is the qualification that will be considered by many as much as is necessary. Therefore you have that to consider. I am quite content, as a humble member of the Society, that we should progress in this orderly and slow manner, and for that reason I think the Bill as it stands is sufficiently elaborate. It may be sufficient, also, with regard to the eligibility for the Council of the number proposed outside the range of pharmaceutical chemists. It may be that within a short time the pharmaceutical chemists themselves may make another concession. The concession of 1868 was a valuable one, and one which we greatly appreciate, and this will be another concession. Some of us therefore are grateful for that. There are other subjects to which I might have referred, but owing to the protracted character of the debate I will not trespass on your time with any further remarks.

Mr. **Johnson**: I should like to be permitted to say a few words in support of Mr. Robinson's proposal. It is difficult to see why so many words were needed for its support, as it seems so logical and reasonable. It is not often that I am at variance with our executive, but upon the present occasion I cannot see through their spectacles. I think they must be of smoked glass this time, which prevents them seeing very far ahead. Now someone has said that pharmaceutical chemists are the backbone of the Pharmaceutical Society, but if so I should like to ask who are the democracy of the Pharmaceutical Society? I think it is the chemists and druggists. As the democracy is said to be the backbone of the nation, so I think the chemists and druggists must be the backbone of the Society. I had a great deal more to say, but I will content myself with observing that I hope Mr. Robinson's proposition will be carried.

The **President**: Of course Mr. Robinson is entitled to a reply, but before calling upon him perhaps you will bear with me for five minutes. The Council, in drawing this Bill and submitting it to the members, do not feel that there is any very great censure being passed upon them by some of the observations, although the tone, I confess, is not what I should have liked. I am not sure who is responsible for that, but the tone of the meeting has not been as good as it has been for many years. I am one of those who helped to unite the chemists and druggists with this Society in 1866, 1867, and 1868. I had to fight with young pharmaceutical chemist members to get them to show the slightest consideration for the chemists and druggists of that time. We sacrificed everything, as Mr. Giles and Mr. Schacht know, for the sake of getting an Act passed which we thought would bring unanimity to the trade. Mr. Sandford, as I said when presenting this bill, was a man who was prescient in such matters, and in the draft bill a proposition was made that every future chemist and druggist, as well as every chemist and druggist in business, should be eligible to become a member. I would remind Mr. Robinson that Mr. Sandford had o give way to our then Major men; we had a special meeting here, the circumstances of which I well remember, and we only escaped and got our Bill through by the skin of our teeth. A proposal was moved and seconded that chemists and druggists in business should be eligible to become members, but that the future Minor men should not. Remember, I am not taking sides, but only speaking history. Three years ago we drafted a bill embracing these clauses and others. It was my privilege and pleasure in many instances, although a work of labour, to talk to very large meetings at places like Manchester, where over 250 people were present, and it was my business to ask them to join the Society to support this bill, and I then pointed out what I was instructed to say and believed to be the liberal terms we were offering those not associated with us. I want to tell you that during the whole course of that tour I never heard an exception taken o that clause, and the clause was referred to over nd over again by me, because I considered it was qual representation of the class of chemists and ruggists. The point we have to consider for ractical purposes is, can we get something like greement amongst ourselves as to what we will go o Parliament with? I would remind Mr. Robinson hat as long as I am in this chair, or whoever ucceeds me, will, when he goes to the lobby, have to o as the mouthpiece of the pharmaceutical chemists nd of chemists and druggists. We are not by any means agreed on this proposition. At a future meeting we might go back, and be inclined to say hat we had been too liberal, at least, that seems to e the tone of the meeting. I would suggest to Mr. Robinson that it would be a pity to divide upon he point. He has taken a purely political iew of the situation, and the situation is ot a political one, as he would soon find he were on the Council of the Society. The Council has governmental executive work to do. Mr. Robinson believes that the electors would in all cases end a fair proportion of pharmaceutical chemists, or not, of men as good, and that might be so; but he nows perfectly well that if anyone raises a burning uestion, he can carry an election as easily as possible. Why I would undertake to run an election for three ears, and to get all my men in, and all the more so ecause we are distributed over the country, and do ot know each other personally—we are not known y name, but merely by numbers. New candidates are not known, and how do they make themselves known? Sometimes by an address which they have written, and sometimes by means of one which has been drafted for them. If elections can be carried by pressure of this kind, I do not think that matter is very serious; but if it can be done, and if such a thing were to happen that you had not a very strong Council, it would be a disadvantage. Moreover, there is one other thing to be said. I am essentially a practical man, and I consider that the last part of the discussion has been purely academic. What we have to do is to agree. The position I take up to-day is that the trade at large has agreed to these clauses with me as your president, and until they have shown all over the country that they are not agreed, and until they have satisfied me as your president that they are dissatisfied with that representation, which they have not, I submit to you it would be unwise to vote for Mr. Robinson's resolution or to pass a resolution at all to-day. The Council wants agreement. I give no opinion at all upon it. There is a great deal to be said from the pharmaceutical chemist member's point of view. If he feels an injustice is being done to him by any bill of ours, he will object just as the chemist and druggist does. My position is that equal numbers on the Council having been accepted by the country at large, it is a great pity that Mr. Robinson should find it necessary to press us to a division here to-day.

Mr. **Robinson**: I have not the least doubt that we are practically agreed on what we all want, namely, to promote the benefit ot the Society, but we are not agreed as to the mode of bringing that about. I think the line in clause 3 would prevent members from joining the Society, and that is my only object in pressing the resolution forward. It is said it is not a political question, but will it not be a political question when you take the Bill to the House of Commons?

The **President**: What I meant was this: you have spoken of the election of the Council from the point of view of a politician.

Mr. **Robinson**: The point I fixed in my mind as being of the first importance was the consolidation of the drug trade. I do not think the best way of doing that is by having inserted in the Bill that ten new men may come upon the Council and no more.

The **President**: The meeting I attended the other day accepted my view.

Mr. **Robinson**: I have done my duty in pointing out that I consider you are doing a foolish thing, and you are aware that I know the inmost minds of a great many men. One more remark. I should like to apologise if I have introduced any tone which is considered not to be pharmaceutical in any way. My only object in doing what I have done has been what I have already stated. I have every admiration for the men who go in for the Major examination; I hope you will see the number largely increased, but I cannot see that it is for the good of the Society, or that it is a wise thing to put a limitation of this kind in the Bill. It would prevent men coming to the Society in the way you want, and all because there is a kind of hostility when they get here. I do not want to see two camps in this Society. Mr. Giles said it could do no good if I carried my resolution; but I think it will induce men to come into the Society who would not otherwise come in. The question has now been fully put before the meeting, and, after all, words are not much, as men will think over the question and vote as they consider best. I do not feel inclined to withdraw the resolution, seeing the support I have, and I commend it to those who think it can do no harm to the Society, while upon the other hand it will do good.

The motion was put to the meeting, and lost by a large majority, fifteen hands only being held up in its favour.

### APPOINTMENT OF SCRUTINEERS.

The **President** then read a list of names of gentlemen who had been nominated to act as scrutineers, and their appointment was unanimously agreed to.

### APPOINTMENT OF AUDITORS.

The following gentlemen were appointed to act as auditors:—

**Butt, Edward Northway**, 13, Curzon Street, Mayfair, W.
**Lescher, Frank Harwood**, 60, Bartholomew Close, E.C.
**Stacey, Samuel Lloyd**, 300, High Holborn, W.C.
**Umney, Charles**, 50, Southwark Street, S.E.
**Yates, Francis**, 64, Park Street, Southwark, S.E.

The **President** then called attention to the fact that the following registers had been laid upon the table in compliance with the provisions of the Act:—

Register of Members, Associates, and Students of the Society.
Register of Pharmaceutical Chemists.
Register of Apprentices and Students under the Act of 1852.
Register of Chemists and Druggists under the Act of 1868.

### VOTE OF THANKS.

Mr. **Giles**: I beg to propose that a very cordial vote of thanks be tendered to the President and the members of the Council for their labours during the past year. I am sorry the President should think that there has been any want of respect shown towards himself or the members of the Council. I can assure him it is more a matter of appearance than reality. I am sure the duties of the Council have been very arduous, and consequently you are entitled to our warmest thanks for the labours on our behalf.

Mr. **Robinson** seconded the motion, which was carried unanimously.

The **President**: Gentlemen, I beg to thank you very much. I think Mr. Giles rather misunderstood me. I did not mean any feeling between the members and the Council, but between the two classes, chemists and druggists and pharmaceutical chemists. I do not want that feeling to be embittered, that was the only feeling I had with regard to it. I may say that the Council would have accepted Mr. Robinson's resolution loyally had it been carried. Their feelings are not hurt in that way. I thank you very much, on behalf of the Council, for the resolution you have just passed.

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## ADJOURNED GENERAL MEETING,

*Thursday, May 24.*

MR. MICHAEL CARTEIGHE, PRESIDENT, IN THE CHAIR.

The adjourned meeting for receiving the report of the Scrutineers was held on Thursday, May 24.

The Chairman of the Scrutineers, Mr. E. N. Butt, read the following report:—

### SCRUTINEERS' REPORT.

We, the undersigned Scrutineers, appointed at the Fifty-third Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

| | | |
|---|---|---|
| Voting papers reported by the Secretary to have been issued . . . . . . | | 3808 |
| Voting papers received . . . . . . | | 2004 |
| Voting papers issued but not returned | | 1804 |
| Voting papers received . . . . . . | | 2004 |
| Voting papers disallowed:— | | |
| Informal . . . . . . . . . . | 4 | |
| Received by post too late . . . . | 33 | —37 |
| Voting papers registered | | 1967 |

*Result of the Poll.*

| | | | |
|---|---|---|---|
| Storrar . . . . . | 1754 | Abraham . . . . | 1581 |
| Johnston . . . . | 1690 | Harrison . . . . | 1537 |
| Martindale . . . | 1687 | Grose . . . . . | 1492 |
| Atkins . . . . . | 1662 | Gostling . . . . | 1383 |
| Cross . . . . . | 1661 | Richardson . . . | 1340 |
| Hills . . . . . | 1626 | | |
| Newsholme . . . | 1625 | | |
| Martin . . . . . | 1623 | Bateson . . . . | 1295 |
| Schacht . . . . | 1607 | Campkin . . . . | 913 |

Edward N. Butt, *Chairman.*

Leo. Atkinson.
D. R. Jacks.
Jas. Spilsbury.
A. E. Tanner.
Wm. Arkinstall.
J. C. Hyslop.
John Holding.
Wm. Fletcher Gadd.
J. G. Atkinson.
F. Bascombe.
Wm. Warren.
Edward B. Stamp.
J. H. Shacklock.
Ernest J. Eastes.
Ernest Goulding.
R. Fisher Young.
I. Bourdas.
W. Prior Robinson.
Henry C. Birch
P. J. Robbins.

### THE NEW COUNCIL.

The **President**, as Chairman, then declared that the following gentlemen would constitute the Council for the ensuing year:—

**Abraham, Alfred Clay**, 87, Bold Street, Liverpool.
**Allen, Charles Bowen**, 20, High Road, Kilburn, London, N.W.
**Atkins, Samuel Ralph**, Market Place, Salisbury.
**Bottle, Alexander**, 37, Townwall Street, Dover.
**Carteighe, Michael**, 180, New Bond Street, London, W.
**Cross, William Gowen**, Mardol, Shrewsbury.
**Gostling, Thomas Preston**, Linden House, Diss.
**Greenish, Thomas**, 20, New St., Dorset Sq., London N.W.
**Grose, Nicholas Male**, 8, Temple Street, Swansea.
**Hampson, Robert**, 2, Knowle Paddock, Sevenoaks.
**Harrison, John**, 33, Bridge Street, Sunderland.
**Hills, Walter**, 225, Oxford Street, London, W.
**Johnston, John**, 45, Union Street, Aberdeen.
**Martin, Nicholas Hy.**, Northumberland Road, Newcastle-on-Tyne.
**Martindale, William**, 10, New Cavendish St., London, W.
**Newsholme, George Thomas Wilkinson**, 74, Market Place, Sheffield.
**Richardson, John George Frederick**, Elmfield, Knighton, Leicester.
**Schacht, George Frederick**, 1, Windsor Terrace, Clifton, Bristol.
**Southall, Alfred**, 17, Bull Street, Birmingham.
**Storrar, David**, 228, High Street, Kirkcaldy, N.B.
**Young, John Rymer**, 42, Sankey St., Warrington.

The **President** next thanked the Scrutineers for their services, and, Mr. Butt having briefly responded, the latter gentleman was specially thanked for acting as Chairman of the Scrutineers, after which the meeting terminated.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Sale of Poison by an Unregistered Person.

At the Wandsworth County Court, on Monday last, before his Honour Judge Lushington, the Pharmaceutical Society sued Robert Briggs, 65, Battersea Park Road, S.W., for two penalties of £5 each for keeping open shop for the retailing, dispensing or compounding poison, contrary to section 15 of the Pharmacy Act, 1868.

Mr. Grey (instructed by Messrs. Flux, Thompson and Flux) appeared for the Pharmaceutical Society. Mr. Nicholls, solicitor, appeared for Mr. Briggs.

Mr. Grey having read the words of the section under which the summons was taken out, said the acts complained were that the defendant, being an unqualified person, on two occasions, viz., March 19 and 27, sold a bottle containing laudanum, which was a preparation of opium. The defendant's name did not appear in the list of registered chemists and druggists, and from the fact of his name not so appearing it must, according to the Act, be taken that he was unqualified, unless he could prove the contrary.

The Judge asked what the defence was.

Mr. Nicholls admitted that his client's name was not on the list. His client's contention was that he was a wholesale dealer, and that this was wholesale dealing within the meaning of the Act; he would also claim the benefit of the exemption in section 16, which referred to the making of and dealing with patent medicines. If the preparation sold was "laudanum *sine* opium," as his client called it, it was a patent medicine, and did not come under the Act.

Mr. Grey said that it would be proved that on two occasions the defendant sold twopennyworth of laudanum. He then called the following evidence.

Mr. John Partridge, examined by Mr. Grey: Do you reside at Brixton?—Yes.

Did you on March 19 last go to a shop at 65, Battersea Park Road?—Yes.

What shop is it?—It is fitted up as a chemist's and druggist's.

What name is there on the door?—Briggs and Co.

What did you ask for?—Twopennyworth of laudanum and twopennyworth of soap liniment, mixed.

Were they put into a bottle for you?—Yes.

Will you look at that bottle? [The witness identified the bottle.]

Was any label put on?—Yes, the same as is on t now.

Was that put on in the shop?—Yes.

What did you do with the bottle?—On May 8 I handed it to Mr. Eastes for analysis.

You went again on March 27?—Yes, and asked for he same as before.

The label is to this effect, "Laudanum, poison; opodeldoc—soap liniment?"—Yes.

Was the bottle also handed to Mr. Eastes?—Yes.

Were the bottles in the same condition as when you eceived them from the defendant's shop?—Yes.

Cross-examined by Mr. Nicholls: The name on the hop was Briggs and Co., was it not?—Yes.

And you sue a man called Robert Briggs?—The defendant there served me with these things.

You do not know who is the proprietor of the shop?—No; I do not.

You do not know, I suppose, Hardcastle and Smith, of Newcastle, whether they are qualified chemists?—I have nothing to do with that.

The Judge: The words of the section are, "sell or keep an open shop," etc.

Mr. Nicholls: I submit that he is an assistant to a qualified chemist.

Mr. Grey: Mr. Justice Hawkins decided in a recent case that whoever it was who sold a poison was liable for so selling within the Pharmacy Act, 1868.

Mr. Ernest John Eastes, examined by Mr. Grey: Are you an analyst, a Fellow of the Institute of Chemistry, and assistant analyst to Professor Attfield?—Yes.

Did you receive these two bottles from the last witness?—Yes.

Did you carefully analyse the contents of both bottles?—I did.

Will you take first the one purchased on March 19? How much did that bottle contain?—One ounce of fluid.

What did you find in that bottle?—I found a preparation of opium.

Is that within the schedule of the Act?—Yes.

The Judge: It is in schedule A.

Mr. Grey: Did you analyse the second bottle?—I did.

What did you find that to contain?—I found that also to contain a preparation of opium.

Would that preparation be dangerous?—Yes; there is enough to kill an adult in each bottle.

Cross-examined by Mr. Nicholls: You could not call it a patent medicine, I suppose?—No.

You are quite sure there was opium in it?—Quite certain.

Did you have also submitted to you at the same time two other bottles from two other local tradesmen in the same district?—No.

Mr. Edward Stocker, examined by Mr. Grey: Do you live at St. John's Hill?—Yes.

Are you poor-rate collector for St. Mary's Ward, Battersea?—Yes.

Do you know the defendant?—I do.

What is he?—He is a chemist at 65, Battersea Park Road.

Is it part of your duty to ascertain the names of tenants with regard to the poor-rate?—It is.

From inquiries which you made, were you informed that the defendant was the tenant of 65, Battersea Park Road?—Yes, I asked if he was the tenant.

The Judge: Is this necessary at all, if the defendant sold the articles?

Mr. Grey: I submit that it is.

The Judge: The words are, "any person who shall sell, or keep an open shop."

Mr. Grey: We did not know at the time that he was the actual person who sold, so we are proving the keeping open shop. We are prepared to prove to-day that he was the person who actually sold.

Mr. Nicholls: I submit that this is not evidence.

Mr. Grey: Has the defendant been tenant of those premises for some years?—Seven or eight years.

Have you collected the rates from him?—I have.

Have they been paid in his name?—They have, but possibly I should explain that some two years ago Mr. Briggs informed me that the word "company" should be added to the name.

Is he also a member of the vestry of that ward?—Yes, but I did not know it till yesterday.

Mr. Nicholls: I submit that the poor-rate book is not evidence.

The Judge: It is some evidence.

Mr. Grey: I put in the register, it will be seen that the defendant's name does not appear.

Mr. Nicholls: My client says that he sold a preparation which he calls "laudanum *sine* opium."

The Judge: You have not asked any question about this.

Mr. Nicholls: I asked the analyst. This man who came round from the Society not only went to my client's shop, but he went to two other shops in the district where they sell this. The Society took a fee of two guineas from them, and do not go on with the prosecution.

Mr. Grey: I must entirely object to this.

The Judge: I cannot go into that.

Mr. Nicholls: Well, those are my instructions.

Mr. Robert Briggs, examined by Mr. Nicholls: Were you articled to a firm of chemists and druggists at Newcastle?—Yes.

Have you been all your life in a chemist's shop?—I have.

Do you recollect March 19?—I do.

Who came into your shop?—An old man. He said he had got a pain in his shoulder, and asked for twopennyworth of laudanum and twopennyworth of opodeldoc in a bottle.

What did that laudanum contain?—A preparation of burnt sugar; no opium at all.

Do you swear that?—I swear it.

What do you call it?—Laudanum *sine* opium.

Do you recollect March 27?—Yes.

Do you recollect the same person coming into your shop?—Yes.

What did he ask for?—He asked for the same preparation; he said it did not do him any good, and he wanted some more.

That was the burnt sugar did not do him any good?—Yes; perhaps the opodeldoc did.

Did you supply him with those bottles (handing two bottles to the witness)?—Those are the bottles, but I cannot tell about the preparation in them.

He never asked you to keep a sample of what you supplied him?—No.

You did not know it was for the purpose of being analysed?—No.

With regard to the second occasion, what do you say you sold him; was there any opium in it?—No.

What was there?—A little burnt sugar, opodeldoc, and soap liniment.

The Judge: Why do you call it laudanum?—Laudanum *sine* opium is laudanum without opium. It is known to chemists who sell laudanum without opium.

Mr. Nicholls: Did they also take samples from other chemists' shops?—Yes.

The Judge: I have nothing to do with that.

Mr. Nicholls: Did you go up to the Society last Saturday?—Yes.

What took place?—They refused to accept the money.

The Judge: I cannot hear that. Let the analyst stand up for one moment.

Mr. Ernest John Eastes, recalled.

The Judge: Is it the practice of chemists to sell laudanum which contains no opium?—No, certainly not. I never heard of such a thing. If it does not contain opium it is not laudanum.

The Judge (to Mr. Grey): Do you ask for the penalty in both cases?

Mr. Grey: I certainly press for the penalty in both cases, your Honour. As you see, by the present state of the gentleman, it is one of those cases that ought to be stopped at once. I must in this case press for the full penalties.

The Judge: Very well.

The defendant here attempted to address the court.

The Judge: The best thing you can do is to go home.

Mr. Nicholls: I must ask for time.

Mr. Grey: One penalty in a case of this sort is no use at all. They simply pay the penalty and go on selling.

The Judge: What is your rent?

The Defendant: £36 a year, your Honour.

The Judge: Then you must pay in fourteen days.

Mr. Grey: I ask for costs under scale A.

The Judge: Very well.

## Obituary.

Notice has been received of the death of the following:—

On May 15, George D. Wolferstan, Chemist and Druggist, of Midhurst. (Aged 52.)

On May 20, at Peebles, William Pinkerton, Chemist and Druggist, of Pinkerton, Gibson & Co., Edinburgh. (Aged 59.) Mr. Pinkerton was well known in pharmaceutical circles throughout Scotland, though he never took a very prominent place in public affairs connected with pharmacy. He became a member of the Society in 1882, and from 1883 to 1886 he was a member of the Executive of the North British Branch.

On May 19, James Wilson, Chemist and Druggist, Turriff. (Aged 22.)

On May 19, Henry Steed Cattle, Chemist and Druggist, Durham. (Aged 48.)

## Diary of the Week.

### TUESDAY, MAY 29.

*Royal Institution of Great Britain*, at 3 p.m.
"The Modern Microscope" (second lecture), by Rev. W. H. Dallinger.

### WEDNESDAY, MAY 30.

*Edinburgh Pharmacy Athletic Club.*
Third Annual Sports in the Powderhall Grounds, at 6.45 p.m.

*Midland Pharmaceutical Association*, at 7 p.m.
Annual Meeting and Supper.

### THURSDAY, MAY 31.

*Royal Institution of Great Britain*, at 3 p.m.
"Egyptian Decorative Art" (second lecture), by W. M. Flinders Petrie.

*Royal Society*, at 4.30 p.m.
Ordinary Meeting.

*School of Pharmacy Students' Association*, at 7 p.m.
Short Notes by various Members.
"Report on Physics," by T. Tickle.

### FRIDAY, JUNE 1.

*Royal Institution of Great Britain*, at 9 p.m.
"The Work of Hertz," by Professor O. Lodge.

*Quekett Microscopical Club*, at 7 p.m.
Conversation and Exhibition of Objects.

### SATURDAY, JUNE 2.

*Royal Institution of Great Britain*, at 3 p.m.
"The Stage and Society" (second lecture), by R. W. Lowe.

*Quekett Microscopical Club.*
Excursion to St. Margaret's for Hertford Heath. To meet at Liverpool Street Station.

*School of Pharmacy Students' Association.*
Botanical Excursion to Watford (by invitation of Professor Attfield), leaving Euston at 2.15 p.m.

*Pharmaceutical Cricket Club* v. *Pemberton Cricket Club* at East Finchley, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Clarke, Cross, Hill, Karop, Pickup, Reynolds, Sage, Sawer, Sutton.

## "THE MONTH."

**Chloralose.** Petit and Polonovski give the rotatory power of α-chloralose, in five per cent. solutions at a temperature of 20° to 22°, as follows:—In 98 per cent. alcohol $[\alpha]_D = +19°·4$; and in 4 per cent. potash solution $[\alpha] = +15°$. The rotatory power of β-chloralose has not yet been determined. It is also found that the addition of traces of either compound to Fehling's solution, and then heating to boiling point, causes an almost immediate change of colour, accompanied by precipitation of the copper salt. Both α- and β-chloralose are freely soluble in potash solution, and on heating they are decomposed, the elimination of chlorine being almost complete after an hour's boiling. Sodium carbonate also attacks chloralose when heated, sodium chloride and carbon dioxide resulting. With barium hydrate formic acid is one of the products of decomposition; with dilute sulphuric or hydrochloric acid chloral and glucose are liberated; and a similar result is brought about more slowly by the action of water. In the case of β-chloralose the reactions take place less quickly relatively, on account of its weak solubility (*Journ. de pharm. et de chim.* [5], xxix., 396).

**Action of Iodine on Aconitine.** Dunstan and Jowett find that when iodine acts on aconitine a variable mixture of aconitine hydriodide and periodide, and an amorphous, neutral substance, which is probably iodo-aconitine, is produced. The principle changes may be represented thus:—

$$(1)\ 2C_{33}H_{45}NO_{12} + I_2 = C_{33}H_{45}NO_{12}·HI + C_{33}H_{44}INO_{12},$$
$$(2)\ C_{33}H_{45}NO_{12}HI + xI_2 = C_{33}H_{45}NO_{12}·HI·xI_2.$$

In attempting to isolate iodo-aconitine a substance was obtained which contained much aconitine, and also a smaller quantity of an amorphous grey powder, which melted indefinitely near 208°, and was nearly insoluble in cold water, but readily dissolved in alcohol and chloroform. The substance did not possess basic properties, and its formula is probably $C_{33}H_{44}INO_{12}$ (*Proc. Chem. Soc.*, 137, p. 96).

**Chemistry of Fungi.** C. Wermer has cultivated fungi, more especially *Aspergillus niger*, upon solutions of peptone containing the necessary mineral constituents for growth, and finds that ammonium oxalate results from the decomposition of the peptone that takes place. Ammonia is probably first formed and combines with the subsequently formed oxalic acid. More than half of the nitrogen in the peptone is said to become combined as ammonium oxalate, but the production of this salt is diminished in the presence of sugar. Fungi that are incapable of neutralising the ammonia formed, by means of oxalic acid, are incapable of existing on a peptone solution, and this acid, it is noted, is not produced if hydrochloric or phosphoric acid be present in the solution (*Ann. agron.*, through *Journ. de pharm.*, [5], xxix., 476).

**Digestion without Ferments.** In a paper read before the Paris Academy of Sciences, A. Dastre points out that the essential phenomenon of digestion consists in the chemical transformation of albuminoids, starchy matters, and sugars, into peptones and glucoses, under the influence of pepsin, trypsin, the amylolytic ferment, and invertin; and that the effects of these digestive ferments can be reproduced in the laboratory at will. In the course of some experiments on fresh fibrin and casein, however, he found that those substances had undergone the process of digestion, although any soluble ferments present had been totally destroyed by the preliminary boiling of the contents of the vessels. Subsequently, he arrived at the conclusion that fresh albuminoid substances may undergo the same changes as under the influence of the gastric juice, without the addition of digestive ferments, if they be kept in contact with antiseptic saline solutions—such as sodium chloride (10–15 per cent.), sodium fluoride (1–2 per cent.), or ammonium chloride (10–15 per cent.)—for a sufficient length of time. In the experiments, the fresh fibrin was first washed with antiseptic solutions and water successively, to neutralise the effect of any ferment present in the tissue, and then totally immersed in an antiseptic saline solution for some days or weeks. The action was most rapid and complete at a temperature of 40° and under a bright light. The fragments of fibrin gradually disappeared in the liquid, two globulins, coagulable at 54° and 75° respectively, together with propeptones and peptones, being formed. The two globulins are alleged to be identical with those produced by the action of the gastric juice on fibrin, which coagulate at the same temperatures and then similarly furnish propeptones and true peptones (*Comp. rend.*, cxviii., 959).

**Pepsin and Papain.** W. B. Thompson suggests that the comparisons that have been instituted between the peptic ferment of animal origin and its analogue found in the juice of the *Carica papaya* have led to statements and observations deserving attention. The action of pepsin on egg-albumin in acidified media may possibly be better understood if the statement that the albumin exists as calcium albuminate be correct. On the other hand, vegetable ferments apparently act but feebly under similar circumstances, alkaline media being found more suitable in this case. Though, therefore, there may be an analogy of function between the animal and vegetable ferments, it appears probable that they cannot be applied or used indiscriminately to restore diminished function in the animal economy. Finally, it is suggested that the two ferments can only be compared in their analogy, their functions being adapted to different organisms (*Amer. Journ. Pharm.*, lxvi., 224).

**Coniine.** J. Schorm observes that the first distillate in the preparation of coniine effervesces when acidified, and oily drops separate, which soon resinify. By redistillation without acidifying, the carbonate of the base loses carbonic acid and distils over as hydrate; this can be neutralised with hydrochloric acid, evaporated, heated until free from odour, dissolved in water, decolorised if necessary, and freed from the last traces of impurity by peroxide of hydrogen, which does not attack the coniine salt present. By crystallisation large colourless crystals of coniine hydrochlorate can be obtained; the mother-liquor contains the hydrochlorate of conhydrin and a third base. The latter two can be separated by shaking an alkaline solution with ether, which removes conhydrin, but not the third base. Hydrate of coniine is preferable to coniine as a starting point for the manufacture of the salts of coniine. Treatment with peroxide of hydrogen is adapted for the purification of nicotine solutions also (*Zeit. angew. Chem.*, through *Chem. Repert.*, xviii., 127).

**Temperature and Rotatory Power.** A. Le Bel discusses the variation in rotatory power caused by changes in temperature. He shows that lowering the temperature causes a decrease in the amount of rotation in the case of many substances. Amylic ether free from amylic alcohol gave the following rotations for 20 Cm.:—

+1°28′ at 65°; +1°13′ at 15°; +34′ at −42°.

Methyl lactate similarly indicated for 5 Cm.:—

−4°47′ at 100°; −4°2′ at 15°; −2°41′ at −23°.

It is pointed out that all the bodies actually known with variable rotatory power are simple ethers. Methyl tartrate varies considerably, but when converted into methyl valeryl tartrate the latter compound is almost free from variation (−8°50′ at 16° and −8°0′ at 23°, for 5 Cm.), whilst the tetra-substituted ethers of tartaric acid are practically invariable between 10° and 100° (*Comp. rend.*, cxviii., 916).

**Simple Freezing Apparatus.** H. N. Warren makes a powerful and easily constructed refrigerator from a fractional distillation flask. In this is placed 10 C.c. each of ether and carbon disulphide, and through the neck is inserted a rubber tube terminating in a glass point, which should almost touch the surface of the liquid. The flask is placed in the water which is to be frozen, and, by means of a pair of constant bellows connected to the rubber tubing, a brisk current of air is forced into the flask. As the vapour of the mixture escapes through the small tubulure in the flask, the thermometer sinks to zero almost immediately, and ice begins to form. A litre of water has been frozen by this means in half-an-hour, when the temperature of the room was 70° F. (*Chem. News*, lxix., 247).

**Cytisine and Ulexine.** Crystallographic examination of the salts of these two alkaloids yields, according to A. Partheil, further proof of their identity (see *Pharm. Journ.*, [3], xxiii., 441). The nitrates, hydrobromides, and dextro-tartrates were examined, and the question of identity may now be considered finally settled (*Archiv.*, ccxxxii., 161).

**New Chloride of Carbon.** E. Barral has prepared the bichloride of benzene hexachloride, $C_4Cl_6{\cdot}Cl_2$, by acting upon phosphorus pentachloride with hexachlorophenol, $C_6Cl_6O$. It occurs as long colourless prisms, melting t 159° to 160°, and forming a liquid which becomes yellow at a higher temperature, being decomposed into chlorine and benzene hexachloride. The new compound is very soluble in anhydrous ether, benzene, or alcohol, especially when warm. Aqueous caustic soda solution does not affect it, but warm, fuming nitric acid dissolves it slowly, probably with decomposition of the chloride (*Comp. rend.*, cxviii., 1049).

**Constituents of Essential Oils.** Schimmel and Co. find that borneol exists in citronella oil to the extent of 1 to 2 per cent. Steam-distilled bergamot oil they state to be inferior to expressed, on account of the decomposition of its chief ingredient, linalyl acetate, which is very unstable, in the process of distillation. Genuine lemon oils, possessing a somewhat lower rotatory power than +60°, may possibly be produced, and from the fruit of "Limoni bastardoni" there has been produced an oil with optical rotation of +58°20′. When below +60°, however, oils are usually either adulterated or of low quality. Indian grass oil has been met with containing as much as 50 per cent. of fixed oils as adulterants. Oil of ginger appears to contain camphene and, in a fraction distilling over at 170°, phellandrene was found. It is suggested that pure distillates of lavender oil should have specific gravity 0·883 to 0·890, at 15°, and optical rotation varying from −5° to −8°, in 100 Mm. tube. One part by volume should dissolve in three parts by volume of 70 per cent. alcohol, and the ester proportion should be 30 to 40 per cent. The finest perfume in lavender oils is found to be invariably associated with the highest ester percentage. American peppermint oil has, so far, been found to contain acetaldehyde, iso-valeraldehyde, iso-valerianic acid (free, and as ester), pinene, phellandrene, cineol, limonene, menthone, menthol, cadinene, and a solid body ($C_{10}H_{16}O_2$, with m.p. 23°) which is the lactone of an oxy-acid melting at 93°. Menthene has not as yet been detected in the oil. The "rhodinol" of Eckart, Barbier, and *Monnet* is proved to be non-existent, the fractions of rose and geranium oils so-called consisting for the greater part of geraniol, with a small proportion of a body smelling like honey, and as yet unexamined. Barbier's "licarhodol" is also identical with geraniol (see *ante*, p. 857). G. M. Behringer's objection to the incorporation of pure methyl salicylate (wintergreen oil) in the new U.S.P., on the ground that being a chemical product it is liable to be adulterated with other synthetic bodies, is held to be quite unjustified by facts (*Bericht*, April).

**Sodium Salicylate in Oil Distillation.** W. Lenz finds that by using, instead of water, a 50 per cent. solution of sodium salicylate, well-known to histologists as a clearing agent, to moisten powdered cloves before distillation, the yield of oil is increased on the average by 1·7 per cent. and the eugenol by 2 per cent.; the same result was obtained with mace (*Zeitschr. Anal. Chem.*, xxxiii., 193).

**Arsenic in Glycerin.** J. B. Nagelvoort describes and figures an apparatus which he has employed for the detection of arsenic in glycerin; although numberless samples of commercial glycerin have passed through his hands, he has never been able to find even traces of arsenic in any one of them (*Pharm. Rundschau*, xii., 109).

**Trigonelline.** The seeds of *Pisum sativum* and *Cannabis sativa* contain, besides choline, an alkaloid, which is identical with trigonelline, a base obtained from *Trigonella fœnum-græcum*; the identity of the two substances is shown by the analysis and properties of the two aurochlorides, $C_7H_7NO_2{\cdot}HAuCl_4$ and $(C_7H_7NO_2)_4{\cdot}3HAuCl_4$. Hantzsch has shown that trigonelline is the methyl-betaine compound of nicotinic acid (*Schulze and Frankfurt Bericht*, xxvii., 769).

**Iodine in Urine.** After a comparison of the methods [illegible] detecting iodine in urine, H. Sand[illegible] prefers to use sodium nitrite, dilute [illegible] phuric acid, and bisulphide of carbon [illegible] chloroform; by this method ·001 per cent. [illegible] be easily detected. For the determination of [illegible] quantity present the best results were yielded by evaporating with sodium carbonate, incinerating, extracting with water, acidulating, distilling with ferric chloride, and titrating with dilute volumetric hyposulphite solution (*Archiv.*, ccxxxii., 177).

**Acetone in Oil of Lemon-grass.** Ph. Barbier and L. Bouveault, in endeavouring to obtain from a large quantity of oil of lemon-grass the citriodoric aldehyde described by F. D. Dodge, succeeded in separating the oil into three portions; one boiling at 65°-75°, under a pressure of 12 Mm.; another boiling at 110°-115°, constituting the aldehyde; and a third forming a viscid brown liquid. The last portion, generally regarded in commerce as terpene, was specially studied and found, in the case of most lemon-grass oils, to contain, in addition to terpene, a non-saturated acetone combining readily with sodium bisulphite. In one instance the acetone was free from terpene, and, in another, there was very little acetone in oil containing fifty per cent. of terpene. The composition of the acetone is represented as $C_8H_{14}O$, it possesses an agreeable penetrating odour, and boils at 169°-170 under the ordinary pressure (*Comp. rend.*, cxviii., 983).

**Pure Geraniol.** This alcohol when pure is described as a colourless liquid with an exceedingly fine rose-like odour. It is optically inactive, has a sp. gr. at 15° of 0·882 to 0·885, and boiling point 230°. It is very soluble in even highly diluted alcohol, one part by volume added to 12 to 15 parts of 50 per cent. alcohol yielding a perfectly clear liquid. Being readily oxidised by the air, and its specific gravity and boiling point being thereby increased, it should be kept in full, stoppered bottles in a cool place (Schimmel's *Bericht*, April).

**Lemonol.** This name is applied by Barbier and Bouveault to the alcohol contained in the essential oil of *Andropogon schœnanthus*, which they claim to have proved to be absolutely different from the essential oil of pelargonium. The name "lemonol" is intended to indicate the relations of the alcohol with citriodoric aldehyde, for which the name "lemonal" is suggested as appropriate on account of its origin from essence of lemon-grass, *Andropogon citratus* (Graminaceæ) (*Comp. rend.*, cxviii., 1154).

**Odours of Volatile Oils.** The tendency of the results of recent investigations is to show that, instead of the characteristic odour of an essential oil being invariably due to one single principal constituent, the other bodies present have also a distinct value in determining the odour. In addition to volatile oils of which the odour is simple in character, there are others in which several odoriferous bodies combine to produce the characteristic odour. Thus, the oils of caraway, anise, and linaloe are examples of those in which the aroma is due to a single odorous body—carvol, anethol, or linalool—the determination of which suffices as a test of their value and purity; whereas the conditions are more complex in the case of the oils of cassia and cinnamon. The odour of cinnamic aldehyde, the chief constituent of cassia oil, is adversely affected by the presence in the oil of cinnamyl acetate, in greater or less proportion; whilst in Ceylon cinnamon oil, eugenol, phellandrene, and small quantities of other compounds not as yet identified, affect the odour of the aldehyde beneficially. Though, therefore, the value of cassia oil may be directly estimated by quantitatively determining the amount of aldehyde contained in it, the same process is not applicable to cinnamon oil, in the case of which the percentage of this ingredient is only one factor in the valuation of the article. Still more complicated conditions exist in the cases of lavender, bergamot, neroli, and petitgrain oils; and rose oil affords a striking example of the important influence which combinations of odoriferous bodies sometimes exercise on the perfume. The oils of rose, geranium, and palmarosa contain approximately the same percentage (80 to 90) of geraniol, which is identical in the three oils. Whilst, however, the last two oils are valued in proportion to the amount of geraniol they contain, the value of rose oil depends upon the various other bodies present, the investigation of which will be necessary before a scientific basis can be found for the chemical examination of rose oil (Schimmel's *Bericht*, April).

**New Essential Oils.** Ground ivy (*Glechoma hederacea*, L.) yields 0·03 per cent. of an essential oil, of s.g. 0·925 at 15°. It is dark green in colour, and not agreeable in odour. Parsley root (*Apium petroselinum*, L.) yields 0·08 per cent. of an oil of s.g. 1·049, from which crystals (probably of apiol) separate. German thyme yields 1·26 per cent. of an oil (s.g. 0·928) containing 24 per cent. of phenols, chiefly thymol. Oil of Canada snake root, from the rhizome of *Asarum canadense*, L., is soluble in twice its volume of 70 per cent. alcohol. The fruit of *Chenopodium ambrosioidis*, L., var. *anthelminticum*, Gray, yields 1·03 per cent. of a bright yellow oil of sp. gr. 0·910 at 15° and opt. rot. −18°55′ in a 100 Mm. tube. The oil from the herb is very similar, but has a sp. gr. of 0·879 and opt. rot. −32°55′. Neither oil gives a perfectly clear solution with ten times its volume of 70 per cent. alcohol, but age probably modifies them in this respect. Oil of golden rod (*Solidago canadensis*, L.) is light yellow in colour and agreeable in odour. Sp. gr. 0·859, and opt. rot. −11°10′. The yield from the fresh herb was 0·63 per cent. The leaves of red cedar (*Juniperus virginiana*, L.) yield 0·2 per cent. of a pale greenish-yellow oil, with an orange-like odour. Its specific gravity is 0·886 and optical rotation +59°5′ (Schimmel's *Bericht*, April).

**Tannin in Species of Myrica.** The bark of the Box-myrtle (*Myrica nagi*, Thunberg) possesses astringent properties, and is used in medicine in Northern India. The powdered bark has been used as a snuff for catarrh with headache and, mixed with ginger, it is given in cholera cases. A sample of myrica kino, examined by D. Hooper, contained 60·8 per cent. of pure tannic acid. The bark of *Myrica rubra*, a species probably identical with the above, was found by Ishikawa to contain from 11 to 14 per cent. of tannin, and a sample of bark from Bombay yielded 13·7 per cent. The rhizome, stem, and leaves of *M. asplenifolia*, L., have recently been examined by C. C. Manger, who found the following maximum proportions of tannin in the moist state:—leaves, 9·42; stem, 3·72; rhizome, 5·47. In an absolutely dry state the proportions were as follows:—leaves, 10·28; stem, 4·16; rhizome, 6·00 (*Am. Journ. Pharm.*, lxvi., 209–11).

**Myrica Asplenifolia.** G. M. Beringer deals with the anatomical structure of this plant. A transverse section of the leaf through the midrib shows the surface to be well marked with simple trichomes and glands. The conductive system consists of a broadly wedge-shaped, almost semi-circular, xylem portion, the wood cells and ducts being arranged in distinct radial rows and subtended by a very narrow cambium layer and a broader sieve portion. Beyond this extends a crescent-shaped layer of bast, and the mechanical system is also strengthened by prominent layers of collenchyma cells situated below the epidermis and on each side of the midrib. The palisade and fundamental parenchyma are well filled with chlorophyll, that towards the lower surface of the leaf being of a spongy, open character. The stem has a thin bark, irregularly shaped and somewhat excentric pith, and the pith cells have thickened walls with distinct pits. The wood forms numerous narrow wedges, and the narrow medullary rays extend well into the middle bark. There is a narrow cambium zone, subtended by a rather broad phloem layer, containing numerous bast cells. Large stone cells form an almost complete zone of sclerenchyma in the parenchyma of the middle bark, and associated with the parenchyma of the cortex are numerous secretion cells filled with a reddish latex, which is also found in the cells of the phelloderm. Illustrations of transverse sections of the leaf, stem (x20), cortex (x50), and pith (x100) serve to elucidate the text of this paper (*Amer. Journ. Pharm.*, lxvi., 220).

**Structure of the Terebinthaceæ.** F. Jadin summarises his researches into the structure and affinities of the Terebinthaceæ in the following conclusions:—(1) The stem in this order is always characterised by the development in the liber of secretory canals, which are protected by the fibres of the pericycle; this is the most important distinction. (2) The different genera examined cannot be distinguished by the anatomical characteristics of the stem, though in certain cases the latter are of value when taken in conjunction with the peculiarities of the external morphology (Ex.—*Pseudosmodingium*, *Dobinea*, *Pseudospondias*, *Cyrtocarpa*, *Mauria*, *Sorindeia*, *Canarium*, *Scutinanthe*, etc.). (3) The presence or absence of medullary canals ought not to be regarded as an important character. They are always absent in certain genera, in others they may be either absent or present, and in *Semecarpus*, *Anacardium*, *Mangifera*, etc., they are constant. (4) Climate is probably an important factor in determining the development of secretory medullary canals (*Ann. des sciences nat.*, [7], xix., 1).

**Poisonous Leguminous Seed.** Dr. J. A. Voelcker, at a recent meeting of the Society of Public Analysts, called attention to the occurrence of a poisonous leguminous seed in Indian peas. The seed was ovate or wedge-shaped, flattened on two sides, had a very mottled or "marbled" appearance, and a thin black line ran over about two-thirds of its circumference. On examination it proved to be the seed of *Lathyrus sativus*, L., or "khesâri" pulse, which has been known to produce paralysis when eaten to excess. Seeds somewhat resembling those of *L. sativus* frequently occur among the ordinary varieties of *Pisum sativum* or *P. arvense*, and must not be confounded with them (*Analyst*, xix., 102).

**Microbes and Disease.** V. Galtier finds that pathogenic microbes, such as *Bacillus anthracis*, *Streptococcus pneumo-enteritis equi*, etc., when attenuated until no longer capable of causing death, may have their energy renewed and become virulent again when two separate species are introduced into the same organism together. Both may increase rapidly side by side, but usually one tends to disappear as its companion recovers its virulence. When two species are found associated it depends upon the manner of their introduction into the organism affected and the species of the latter which one shall become more active. In the laboratory this tendency of associated species of bacteria may be utilised to restore to attenuated. microbes their original virulence. Explanations may thus be afforded also of the revival of certain epidemics and of the aggravated effects produced in cases of vaccination by means of otherwise harmless virus, as the entry into the system of a microbe which confers immunity against a given disease may increase the tendency to infection by another (*Comp. rend.*, cxviii., 1001).

**Antitoxins.** H. Aronsohn prepares antitoxins of high activity by precipitating them from solutions by means of aluminium hydrate, filtering, shaking the precipitate with dilute alkalies, filtering. and evaporating in vacuo (*Berl. klin. Wochenschr.*, through *Chem. repert.*, xviii., 133).

**Ipecacuanha.** J. Moeller observes that Carthagena and Rio ipecacuanha can be distinguished from one another by the difference in the size of the starch grains, those of the former variety being about twice as large as those of the latter, but a marked differentiation of the cortex of the Carthagena root into two layers, as described by Karsten, could not be detected. The "striated" ipecacuanha with dense wood and sugary cortex differs from Carthagena ipecacuanha only in containing sugar instead of starch. Moeller considers that the two roots are probably derived from the same plant, but have been collected at different periods. He compares them to the autumn and spring belladonna roots, and finds confirmation of his supposition in the absence of alkaloid from the sugary (spring) root. Moeller has also examined the false Indian ipecacuanha, and contests Nevinny's opinion that it is the rhizome of *Helonias dioica*; the latter is a North American plant, and differs in anatomical structure from the Indian root. The latter, Moeller considers to be the rhizome of a plant belonging to the natural order Aroideæ (*Pharm. Rundschau*, xii., 104).

**Absorption of Guaiacol.** Linossier and Lannois, in a paper read before the Société de Thérapeutique, show that guaiacol is very rapidly absorbed by the skin. It is almost invariably found in the urine a quarter of an hour after application, and generally the maximum elimination is attained within two to [illegible] hours. After twenty-four hours it is rare to find even traces in the urine. As much as 3·5 Gm. has been recovered from the urine after the application of 5 Gm. to the skin, and after rubbing in [illegible] as much as 1·10 Gm. has been recovered. A certain amount is eliminated also by the [illegible] glands, lungs, etc. The best results are stated to have been obtained by painting doses of 4 Gm. upon the skin, the absorption being then equal to 55 per cent. With a much stronger dose not more than 35 to 37 per cent. is eliminated, and there is then some risk of poisonous effects being produced (*Journ. de pharm.*, [5], xxix., 482).

**Formaldehyde as an Antiseptic.** In reference to the note on this subject in the Month (see *Ph. J.*, *ante*, p. 894), a correspondent writes to point out the very irritating character of the fumes and their action upon the mucous membrane of the nostrils and throat. The effects are described as being very painful, and it would appear to be necessary to exercise caution in this respect when using formaldehyde. It is worth noting that a patent (No. 7038 for 1893) has been granted for "a new antiseptic material," consisting of a 40 per cent. solution of formaldehyde, under the name of "formalin." In the specification it is claimed to have but a small poisonous effect on the human organism. The method of preparation preferred is to pass air through methyl alcohol, and then over gently heated, oxidised copper gauze, after which the resulting mixture of air and gaseous formaldehyde is passed into water.

**Formaldehyde for Hardening.** Dr. W. M. Eccles compares the hardening action of formic aldehyde on tissues with that of the fluids in general use. Absolute lcohol, he points out, hardens most tissues in four or five days, but is apt to render them brittle, or hardens them very unequally. Methyated spirit requires about a fortnight to act satisfactorily. Chromic acid, with or without alcohol, ardens in about a week, but also renders tissues rittle; and potassium bichromate in Müller's luid, though giving good results, requires often as ong as six weeks, and most be renewed many imes before the process is completed. Finally, ercury perchloride, which hardens rapidly, intereres with the subsequent staining processes. In he case of formic aldehyde very soft varieties of ormal and pathological structures, the most diffiult ones to prepare, were all hardened well in three ays. None of the tissues became brittle, all eing easily cut in an ether-freezing microtome ter soaking in gum, and all stained well with gwood and eosine. At the same time the cells ere unaltered in shape or character. For very ft tissues a 40 per cent. solution is preferred, r firmer ones 20 per cent. suffices, and for quite m material 10 per cent. (*Brit. Med. Journ* , 1743, 1124).

**entification f Saffron ubstitutes.** A. Alessi finds that the poisonous Martius yellow can be identified by dissolving in water, precipitating by hydrochloric acid, washing, dissolving e precipitate in ammonia, and adding solution cyanide of potussium; a precipitate forms hich gives when mixed with concentrated sul-uric acid a fine red or violet colour, due to the rmation of Sommaruga's indophan. This re-tion is characteristic for Martius yellow, and stinguishes it from the equally poisonous di-trocresol and hexanitro-diphenylamine. S. naph-ol yellow can be identified by igniting with dium carbonate and potassium nitrate, and sting for sulphate (*Selmi*, 1894, through *Chem. pert.*, xviii., 132).

## BRITISH PHARMACEUTICAL CONFERENCE.

### MEETING AT OXFORD IN AUGUST, 1894.

### *Subjects Suggested for Investigation.*

1. *Strophanthus.*—The chemistry of this drug requires further elucidation, the statements of various authors hitherto published being conflicting. (See 'Year-Book of Pharmacy,' 1888, pp. 60–62; also 1889, pp. 449–691).

2. *Catha edulis.*—The leaves of this plant are said to possess stimulating properties. A general examination is desirable. (See *Pharm. Journ.*, [3], iv., p. 421; also [3], xvii., p. 1009; 'Year-Book of Pharmacy,' 1887, p. 430).

3. *Cascara Sagrada.*—The nature of the various resins contained in this bark, and the relation of the bitter resin to the therapeutic activity.

4. *Ailanthus excelsa.*—The bark of this plant is intensely bitter, and merits a complete chemical examination.

5. *Melon Root.*—Torosicviez some years ago isolated from this root a crude principle possessing marked emetic and purgative properties. (See *Pharm. Journ.*, [3], xvii., 687). Required, an investigation throwing further light on the chemical nature of this constituent.

6. *Spigelia Marilandica.*—This plant, which is used as an anthelmintic, is reported by Dr. A. H. Hare to possess poisonous properties allied to those of Gelsemium. (See *Practitioner*, July, 1887, p. 61). A systematic examination is required. (See *Journ. de Pharm. et de Chim.*, 1888, p. 541).

7. *Rhubarb.*—Examination is required of the statement that chrysophanic acid does not pre-exist in this drug, but that it is formed on the addition of water from the glucoside chrysophan under the influence of a ferment. (See 'Year-Book of Pharmacy,' 1885, p. 147).

8. *Cimicifuga racemosa (Actæa racemosa).*—Report on the chemical nature of the constituent or constituents to which the rhizome of this plant owes its activity. (See 'Year-Book of Pharmacy,' 1885, p. 149).

9. *Euphorbia heterodoxa.*—Required, a report on the chemistry of this drug, which, under the name of Alveloz, is recommended for the treatment of malignant ulcers. (See *Pharm. Journ.*, [3], xviii., p. 9; also *American Journal of Pharmacy*, July, 1885, p. 328).

10. *Podophyllin.*—To what extent do the widely different shades of this drug, as met with in commerce, differ from each other in composition?

11. *Belladonna Plaster.*—Modifications in the official process for the preparation of this plaster, so as to yield a more satisfactory product.

12. *Mispronunciation of Latin Pharmacopœia Names is Common.*—It is suggested that a short prosody be compiled for purposes of reference.

13. *The Two Sennas of the British Pharmacopœia are permitted to be used indifferently.*—Is the supposition that they differ materially in strength correct? If so, what is the extent of the difference?

14. *Ol. Eucalypti B.P.*—A more precise definition for this oil is required.

15. *Tinctura Cinchonæ.*—Can any improvement be suggested in the process for the preparation of this

tincture, such as will materially lessen the waste of alkaloids? (See 'Year-Book of Pharmacy,' 1892, p. 469).

16. *Extractum Cinchonæ Liquidum.*—A good process, involving no notable loss of alkaloids, is still a desideratum. Further experiments are required.

17. *Extraction of Drugs by Pressure.*—This mode of extraction (see Dr. Syme's suggestions in the 'Year-Book of Pharmacy,' 1888, p. 356) is likely to produce good results with a number of drugs. Required, a series of experiments in this direction, showing the effect of the process on the quality and yield of extracts as compared with the corresponding products obtained by the ordinary modes of extraction.

18. *Papain.*—The value of commercial papain as a digestive.

19. *Commercial Atropine.*—This is stated to be a mixture of atropine and hyoscyamine. How can they be separated, and what are the relative proportions? (Consult *Berichte der deutsch. Chem. Ges.*, xxi., p. 1717).

20. *Astringent Drugs and Preparations.*—The various methods employed for the estimation of tannin in these give very discrepant results. Required, a thorough research into the comparative merits of these processes.

21. *Thyroid Gland.*—Several different methods of making preparations of the gland have been proposed. It is suggested that these be compared with a view to choosing or devising one or more that shall be generally acceptable. (See *Pharm. Journ.*, [3], xxiii., p. 321; also *Brit. Med. Journ.*, i., 1893, p. 289).

22. *Aromatic Waters.*—What is the cause of the difference of aroma in these waters as obtained by distillation from the drug and from the oil respectively?

23. *Essence of Rennet.*—A good formula for a stable preparation is required.

24. *Standardised Preparations.*—Further suggestions for standardising pharmaceutical preparations. Report on commercial specimens of official standardised preparations.

25. *Cherry-Laurel.*—The so-called amygdalin of cherry-laurel leaves is stated to differ both physically and chemically from the amygdalin of bitter almonds (E. Lehmann. 'Neues Repertorium für Pharmacie,' 1874, pp. 448-481), and nothing is as yet known of the body which induces its decomposition.

26. *Cortex Rhamni Frangulæ.*—This bark is said to be unsuitable for medicinal use before it is at least twelve months old. (*Zeitschrift des Oesterr. Apoth. Ver.*, 1876, p. 156). It is proposed to verify this statement, and to explain the nature of the change the bark undergoes on keeping. (See *Journal Chemical Society*, lvii., *Trans.*, p. 38; also vol. lxi., *Trans.*, p. 1).

27. *Effect of Cultivation, Soil, and Climate on Medicinal Plants.*—Comparative medicinal activity of indigenous plants grown in different districts of this country, and in soils of different chemical composition.

28. *Mezereon Bark.*—What is the chemical nature of the acrid principle of this bark?

29. *Hemidesmus Root.*—What are its chemical constituents? To what does it owe its medicinal qualities? No adequate analysis of this root has yet been made.—Accepted by Mr. H. Bowden.

30. *Arnica.*—What is the active principle, and what are the relative proportions of it in the root and flower?

(*To be continued*).

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## THE EFFECT OF EXTERNAL CONDITIONS UPON DEVELOPMENT.*

BY PROFESSOR AUGUST WEISMANN, PH.D., D.C.L.

There is now ample justification for the belief that evolution is not due merely to internal causes, though we are as yet by no means quite clear as to the manner in which external influences have formed and transformed organisms. There is still a conflict between rival theories, and important points, though often apparently clear, are in reality not so.

It is often assumed, without sufficient proof, that a particular variation of an organism is the direct consequence of some external influence, simply because some casual connection exists between the two; but such an assumption is based upon a totally false idea as to the interconnection of the phenomena. In many cases this will be readily granted; take, for instance, that of the leaves of *Mimosa*, which close when they are touched. The actual cause of the movement is here due to the peculiar constitution of the plant, and not to the touch. The geotropism of plants, again, is not the direct effect of gravity, but is due to a special power of adaptation possessed by the plant. In reference to the histological adaptation of animal tissues, let us take as an example the structure of the latticework in spongy bones. Roux has shown that this is due to processes of selection and for a struggle for existence between the various parts of the body. This process may be spoken of as "intra-selection," and it may be shown that its effects are not inherited, as assumed by Roux, but that heredity only concerns those potentialities from which structures are developed by intra-selection. We may believe that the potentialities have not arisen through the struggle between the parts of an organism, but through that between individuals; not by intra-selection, but by the ordinary process of natural selection. The *causa efficiens* of this histological adaptation is not, therefore, the tension or pressure which acts on the bones, but the adaptive material upon which such forces operate. The theory of intra-selection thereby loses nothing of its value, but on the contrary, is admitted to be of the greatest importance in maintaining the "co-adaptation" of parts during the metamorphosis of species.

The organism can, however, also be affected by external influences for which it is not adapted in advance. This is the case as regards the ordinary seasonal dimorphism of butterflies; but even seasonal differences may be produced by adaptation—here a double adaptation—in which the external influences of temperature do not act as the direct causes of change, but only as stimuli, which determine as to which of the two forms of the species shall arise.

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* Abstract of the Romanes Lecture delivered in the Sheldonian Theatre at Oxford, on May 2. Reprinted from *Nature*.

In the case of neuters of social insects, the external influence—scanty food—is not, as Herbert Spencer assumes, the true *causa efficiens* which produces the sterility of their caste, but only the stimulus by which the primary constituents (*Anlagen*) of the worker-type are brought into activity. At least three kinds of primary constituents—those of the male, the fertile female, and the worker—must be contained in the eggs of ants, bees, and termites; the nature of the stimulus acting upon the egg determines the kind of primary constituent which shall come into activity. These opinions are confirmed by experiments made on flies, which show that insufficient nourishment supplied to the larva does not in any way affect the development of the ovary. The disappearance of typical organs—such as the ovarian egg-tubes of bees and ants—is thus shown to be a phylogenetic and not an ontogenetic process: it does not depend on mere influences of nutrition, but on variation in the primary constituents of the germ; and thus can only come about in the course of numerous generations. The case of social insects is therefore far from contributing any support to the view that acquired characters are inherited, and that the inheritance of the effects of use or disuse play a part in the transformation of species, as is assumed by Herbert Spencer.

Thus we see that external influences in many cases serve as the impulse which starts the process of development in certain of the primary constituents. The actual cause of these individual dissimilarities is in all cases to be sought in the modification occurring amongst the primary constituents of the body itself; and such purposeful modifications can only have originated by selection. Even when to all appearance external influences have had direct action in causing purposeful modifications, a more careful examination will always show that they have only served to bring some performed adaptation into activity. This is proved in a specially conclusive manner by the consideration of sterility in the workers of bees and ants: the sterility is not due to poor nourishment, but to natural selection, which has determined the nature of the primary constituents in the ovary. This case is of especial interest, as it has been so much relied on as a support to the Lamarckian principle of the inheritance of acquired qualities. Here, as in all other instances, the Lamarckian hypothesis is untenable; selection has been the only principle on which the development of the organic world has been guided on its course.

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## THE PHARMACEUTICAL SOCIETY AND PATENT MEDICINES.

### THE 'LAW JOURNAL'S' OPINION.

Under the above heading, the *Law Journal* comments upon the recent proceedings in the Court of Chancery, as follows:—

The Pharmaceutical Society is still pursuing its crusade against patent medicines containing poisons. Under the Pharmacy Act, 1868, restrictions were imposed on the sale of poisons, but by section 16 it was provided that nothing previously contained in the Act was to extend to or interfere with the making or dealing in patent medicines.

In the case of the Pharmaceutical Society *v.* Piper, L. R. (1893) 1 Q. B. 686, the Society brought an action in the county court against a grocer to recover a penalty of £5 for retailing an article called chlorodyne, which contained poison—to wit, opium and chloroform. Chlorodyne was a proprietary medicine sold under a Government stamp, and was admittedly useful; but it had never been protected by letters patent. The defendant called evidence to show that from 1868 the term "patent medicine" had been universally considered in the trade to include proprietary medicines, of which there were several thousands in existence. The county court judge, however, held that chlorodyne did not come within the exceptions in favour of patent medicines, and gave judgment for the plaintiffs, and this decision was affirmed by a divisional court. This case disposed of proprietary medicines, but the Society soon found that grants of Letters Patent for medicines containing poisons had been applied for in certain cases, as the Society believed, for the purpose of evading the provisions of the Pharmacy Act. The Society came to the conclusion that it was its duty to procure the revocation of such Letters Patent when they were in a position to prove that the Letters Patent ought not to have been applied for or granted.

Accordingly, the Society has commenced proceedings for the revocation of several Letters Patent. In Sleight's Patent, 10 R. P. C. 447, the patent in question (No. 20,377 of 1892) was for "an improvement in cough mixtures," and the patentee claimed "a preparation of hedge hyssop in conjunction with one or more of the ingredients therein described." Amongst the ingredients were morphine and chloroform, and the Society asked for the revocation of the patent on the grounds that the ingredients and hyssop had been in common use many years, and the combination described was not novel, that the patent was invalid for that and other reasons, and that as some of the ingredients were poisons it would be prejudicial that such poisons should, under a void patent, be exempted from the provisions of the Pharmacy Act. The patentee appeared in person at the hearing, and said he could not oppose the petition, and Mr. Justice Chitty made an order for revocation.

This case has been followed by two others, which came before Mr. Justice Stirling on April 14, 1894, and will shortly be reported in the Patent Reports. In the first case, Kay's Patent, Weekly Notes (1894), 68, the Society sought revocations of a patent No. 16,496 of 1892, granted to T. Kay, G. A. Shaw, and Kay Bros. Limited, for a new and improved method of preparing the medicinal compound known as chlorodyne. The new preparation was called "Klorodine," and consisted of "a homogeneous combination of an alcoholic solution of chloroform, morphine, ether, and essential oil with glycerine." The Society asked for revocation on the ground that the combination was well known and in common use, and the invention was not subject-matter, being merely the mixture of a well-known combination with glycerine to make the whole homogeneous. This petition was not disposed of, as it appeared that one of the patentees was abroad, and could not be served; directions were given that the petition should go into the Witness List, but unless the patentee appeared by consent on notice given to him (as in King and Co.'s Trade Mark, 9 R. P. C. 350) should not come on for hearing without leave. We therefore pass from this case without further comment, except that it may be remarked that it is clearly an attempt, whether successful or not remains to be seen, to negative the result of the Pharmaceutical Society *v.* Piper (*supra*) by turning chlorodyne into a patent medicine (see page 1020).

In the second case, the patent sought to be revoked was No. 13,922 of 1892, granted to Mary Rendell for a new and improved compound for the cure of cholera, dysentery, and similar ailments. The compound consisted of an eight-ounce bottle full of the following ingredients: sal volatile, 2 oz.; peppermint, 2 oz.; spirits of camphor, 2 oz.; and laudanum, 2 oz., the dose to be taken in hot or cold water with sugar. The Society, as in the previous cases, complained of the want of novelty of the compound, that it contained a poison, and it was prejudicial to the public if, under a void patent, such poison could be claimed to be a patent medicine, and so be wrongfully exempted from the provisions of the Pharmacy Act. The patentee was represented by counsel, who, while objecting to any attack on the patent on the ground of its containing a poison, admitted want of novelty, and consented to revocation.

It is impossible, after hearing the two cases of Sleight's patent and Rendell's patent, to avoid asking how it comes to pass that such patents were granted at all. Surely the Patent Office, or, at any rate, the Board of Trade, has sufficient knowledge at its disposal to consider the question of novelty in such cases. The reception of fees ought not to be the entire function of the patent-giving authorities. Some scheme of supervision ought to be devised, if not in all cases, at any rate in such cases as the present, where the reckless granting of a patent may put poisons readily into the hands of the public.

We notice in a recent case of the Pharmaceutical Society *v.* Delve, L. R. (1894) 1 Q. B. 71, it was decided that, in order to render a person liable under the Pharmacy Act of selling poisons without being a chemist, it is not sufficient to prove the sale of a compound containing an infinitesimally small quantity of poison. In that case the sale of a preparation of morphine called "Licoricine," containing more than a trace of morphine, was held, in the absence of any real evidence of quantity, not to justify a penalty being awarded against the seller.

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## APPLICATIONS FOR PATENTS FOR MEDICINAL COMPOUNDS, IN 1894.

550.—A new or improved ointment for human use.
By Elizabeth Gregory, 1, East Parade, Leeds. January 10.

892.—A medicine for the human body.
By Charles Edward Hope, 61, Bedford Road, Ilford. January 15.

1241.—An improved embrocation or liniment.
By William Henry Simmons, 1, Queen Victoria Street, London. January 19.

1291.—An improved ointment.
By John Nathan Francis, 24, Winsley Road, Colchester. January 20.
[A preparation of Russian fat and turpentine].

1407.—A preparation for medical use.
By Joseph Hartley Rhodes, 19, Bowling Green Street, Leicester. January 23.

1639.—Liver pills.
By Mrs. Georgiana Elizabeth Sarah Ingram (Executrix of George Elven, deceased), 238, Whitechapel Road. January 25.

1806.—An improved healing ointment or composition.
By George Moxon, 6, John Dalton Street, Manchester. January 27.
[A preparation of red and white precipitates].

2073.—An improved medicine chiefly intended for curing piles and constipation.
By Gerald Augustine Shoppee and Henry Durham, 45, Southampton Buildings, W.C. January 31.
[A preparation of senna].

2235.—Preparation of remedial substances.
By August Zimmerman, 24, Southampton Buildings, W.C. February 1.

3179.—A new or improved anti-pyretic and anti-neuralgic preparation.
By Siegmund Radlauer, 70, Market Street, Manchester. February 14.

3451.—Pile salve.
By William Edgington, "The Green Man," Upton Park, London. February 17.

3500.—A scab wash or medicinal lotion for the cure of scab in sheep.
By Alexander Robertson, Oban, N.B. February 19.

4753.—An improved medicinal mixture.
By George Gale, 37, Chancery Lane, W.C. March 6.

6033.—The manufacture of certain bodies suitable as remedies.
By August Zimmerman, 24, Southampton Buildings, W.C. March 22.

6727.—An improved medicinal compound.
By William Bowers, John Robert Kilby, and Arthur Barker, 2, Quality Court, Chancery Lane, W.C. April 4.

7310.—An embrocation for the treatment of rheumatism and other complaints, bruises, sprains, and the like.
By Mary Ann Betts, 1, Broad Street Buildings, E.C. April 12.

8462.—Cure for scalds from boiling hot liquid, steam, and burns from fire, varicose veins, sprains, piles, sciatica, hydrophobia, and other cases.
By Charles Schuttyser, 2, Peel Place, Silver Street, Kensington, W. April 28.

9002.—A new or improved medicinal compound for the treatment of toothache and neuralgia.
By Edward Leonard, 9, Westland Row, Dublin. May 7.

9725.—A salve for sores.
By James Taylor and John Taylor, 115 St. Vincent Street, Glasgow. May 18.

The Pharmaceutical Journal

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*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## DEATH BY POISON.

THE questions which have recently been raised in relation to the application of those provisions of the Pharmacy Act, 1868, more directly bearing upon the sale of poisons, being still to some extent undecided, it is interesting to consider any evidence calculated to throw light upon this important subject. The report of the Registrar-General of Births, Deaths, and Marriages in England and Wales for the year 1892 furnishes as usual an elaborate statement of particulars as to deaths caused by poison, the conditions under which they have happened, and the kinds of poison which have been the cause of death, either by accident or otherwise. We propose, therefore, as on previous occasions, to place before our readers a summary of the information to be gathered from this report.

The total number of deaths caused by poison in 1892 amounted to 820, or 56 less than in the previous year. Of these 514 were the result of accident, 301 were cases of suicide, and 5 were homicides. The recorded cases of death by accidental poisoning were fewer by 30 than in the previous year, and they amounted to 3·14 per cent. of the total number of deaths due to accident or negligence of all kinds, while the proportion in the previous year was 3·26 per cent.

Without attempting to speculate on the causes by which this considerable reduction in the number of deaths from accidental poisoning has been brought about, it will be useful to consider the data given as to the particular kinds of poison which have been the cause of death. In accordance with previous experience, various kinds of opiate preparations have been the cause of death in the largest number of instances. The total number of such cases is 104, the number of males and females being exactly equal, and though the total number is less than in 1892, the proportion to the entire number of deaths by accidental poisoning is 20·2 per cent., or nearly the same as in that year. All the preparations to which these deaths are attributed are poisons within the meaning of the Pharmacy Act, inasmuch as they are preparations of opium, or of its principal narcotic constituent, morphine, and it may be inferred from the number of cases in which they have been the cause of death accidentally, that there is substantial reason for the restrictions placed upon their sale by the Pharmacy Act. Among other scheduled poisons which have been the cause of death by accident, chloroform comes next as having caused the largest number of deaths, 46 in all, 30 males and 16 females. Next in order comes arsenic, as the cause of 15 deaths, then strychnine and nux vomica, as the cause of 6 deaths, and lastly prussic acid or cyanides, as the cause of 2 deaths. Hence, the number of accidental deaths caused by articles that are poisons within the meaning of the Pharmacy Act amounted to 173, or 33·27 per cent. of the total number of deaths by accidental poisoning.

Of the remaining 341 cases of accidental death by poison there are 33 in which the kind of poison is not recorded. 128 deaths were caused by a large number of sundry poisonous articles which do not require to be noticed here, and 129 deaths are attributed to the metals lead, mercury, copper, and antimony. Of the remaining 51 deaths, 33 are attributed to carbolic acid and 18 to mineral acids, which are not included in the poison schedule. Leaving out of consideration the deaths caused by opiate preparations, the comparatively small number of instances in which medicinal agents or scheduled poisons have been the cause of accidental death, affords ground for the inference that by restricting the sale of such articles to the hands of competent persons, the provisions of the Pharmacy Act have materially contributed to the safety of the public. On the other hand, the circumstance that so large a proportion of accidental deaths have been caused by articles in respect to which the provisions of the Act have not been observed in all instances, shows that there is need for enforcing the law with greater stringency. The ignorant or careless use of narcotic preparations has been promoted by the undue facilities with which they could be obtained in the form of secret preparations, and by the neglect of precautions which can only be expected from persons possessing the requisite technical knowledge.

The lesson to be learnt from the report of the Registrar-General is not confined to the cases of accidental poisoning. The number of suicides effected by means of poison in 1892 was 301, while in 1891 they amounted to 327. Of that number there were 60 in which narcotic preparations were the cause of death, 37 are attributed to prussic acid or cyanides, 18 to strychnine, 6 to arsenic, 3 to chloroform, 73 to carbolic acid, and 14 to mineral acids not included in the poison schedule, while in 45 cases a number of miscellaneous articles are set down as the cause of death, and in 45 the particular poison is not stated. It has been very justly remarked that legislative measures cannot be expected to prevent suicide, but the evidence afforded as to the use of poison for the purpose shows at least that the means of obtaining poison should be surrounded by conditions which will operate in that direction, besides reducing the risk of accidental poisoning. If the statistics of the Registrar-General's report for 1892 can be taken as indicating the effect of the better observance of the Pharmacy Act which has recently been brought about, the actual diminution in the number of deaths by poison, both accidental and suicidal, may be regarded as satisfactory in that respect, and as affording promise of still greater improvement.

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## THE BRITISH PHARMACOPŒIA REPORT FOR 1893.

Professor Attfield's report on the progress of pharmacy in its relation to the revision of the British Pharmacopœia has been submitted to the General Medical Council, and we are indebted to the author for a copy of it. The subjects treated of belong for the most part to those which are of fundamental importance in the construction of the Pharmacopœia, and at the present time demand primary consideration as indicating some of the chief lines on which the details of reconstruction might afterwards be submitted to the Council. The references to details of pharmaceutical comment on particular preparations or articles of the materia medica are not so copious as they have been in former reports. Taking them in the order in which they stand in the report, the omission of *Acetum*, suggested by Hill eight years ago (see *Ph. J.*, [3], xvi., 654), is supported as desirable, and in regard to the single preparation for which it is directed to be used—*Emplastrum saponis fuscum*—it is suggested that while a proportionate quantity of *Acidum aceticum dilutum* might be employed in the place of vinegar, the brown colour of the plaster might well be obtained by other means less unworthy of modern pharmacy if there be really any demand for darkening the product. The whole process for the preparation of this plaster is criticised as belonging to a pre-scientific period, and it is further suggested that there may be little reason for retaining the plaster officially (see McEwan, *Ph. J.*, lii., 561). In that case the necessity for retaining *Acetum* would be limited by the extent to which it may be prescribed, and even then it would be consistent with present knowledge and with the directions for preparing the official *Aceta* to authorise the use of *Acidum aceticum dilutum* when vinegar is prescribed.

On the subject of aconitine it is remarked that in the next edition of the Pharmacopœia this alkaloid will no doubt be defined as crystalline, and that due cognisance will be taken of the investigations by which better knowledge of its nature and characters has been acquired. Among the workers who have contributed to that result the names of two British pharmaceutical chemists—T. B. Groves and John Williams—occupy a promient place, together with those of Wright, Luff, and Dunstan.

The proposals which have been made by Coull, Hill, Hyslop and Sage (see *Ph. J.*, [3], xx., 45, 416; li., 699; lii., 639), with a view to improving the preparation of distilled water and the methods of testing the product, are made the basis of a recommendation that the official directions relating to this article should be correspondingly amended.

Under the head of *Argenti nitras* it is suggested that this article admits of an extension of the action taken by the Medical Council in regard to the withdrawal of processes for the manufacture of chemical products which admit of being defined, so as to be well identified by analytical tests as to their nature and quality. In support of that view it is urged that the advance of analytical chemistry has furnished means for obtaining a guarantee of constancy of properties in most articles of that kind which supersede the necessity for prescribing constant methods of preparation. At the same time it may be necessary to improve or amplify the official definitions of chemical and physical characters, as well as the descriptions of methods of testing. The official directions for the production of *Arsenii iodidum* are mentioned as affording another illustration of the uselessness of such directions under the present advanced conditions of chemistry and pharmacy. The educational value they may have had has been rendered superfluous by books specially designed to supply that requirement, and a pharmacopœia is no longer the place where it is to be provided for. In the case of *Arsenii iodidum*, the official directions are insufficient for securing uniformity of the product or the absence of probable impurities, and although the chemical formula given indicates the particular iodide to be obtained, the product of the operation described might be of a different nature.

Considerable attention is given to the two varieties of ether recognised in the British Pharmacopœia for ordinary use as a medicinal agent and for producing anæsthesia by inhalation. The description of the latter as *Æther purus* is to some extent a misnomer, or at best only relatively true, and might well be replaced by the term purified ether, as the difference in purity from that of ordinary medicinal ether extends only to the absence of water and some admixture of alcohol, as indicated by the specific gravity not exceeding 0·7 The difficulty of producing ethyl ether of 0·7 specific gravity uncontaminated with possible purities, and the circumstance that ether belongs to the class of substances respecting which the Pharmacopœia states that it is optional for manufacturers to use other processes than those officially described, have conjointly been productive of difficulty, owing to the ease with which an ether of 0·720 specific gravity can be produced from methylated spirit. The methyl ether present in this product must be regarded as an impurity that may be injurious when the ether is used for inhaling, and as a means of reducing the possibility of its being supplied for that purpose, ABRAHAM and DOTT have both suggested that the official specific gravity should be raised to 0·724. Professor ATTFIELD's reference to this subject is extremely guarded, and while stating the facts of the case, it cannot be inferred that he actually recommends the adoption of the suggested increase in the specific gravity of official *Æther purus*. But he points out that while ether of specific gravity 0·724 would be comparatively useless for producing local anæsthesia, the "methylated ether" of specific gravity 0·717, which is used for photographic purposes, answers perfectly as a local anæsthetic, and he suggests that the question whether it or any local anæsthetic should be officially recognised is one to be dealt with by the medical authorities. If methylated ether were adopted for that purpose there would be a third variety of ether introduced into the Pharmacopœia, and in such a case the characters and tests proposed by DOTT should be adopted officially (see *Ph. J.*, [3], xxiii., 617). A further possibly necessary consequence of the introduction of methylated ether into the Pharmacopœia would be the official definition of methylated spirit, inasmuch as that article varies in quality as met with in commerce.

In connection with *Liquor magnesii carbonatis* it is stated that there appears to be no difficulty in preparing it of such strength as to represent 2 per cent. by weight of official magnesium carbonate, corresponding to nearly nine grains in the fluid ounce. To provide against the deposition of carbonate after a bottle has been opened it is suggested that the directions for keeping this preparation should be amended by specifying "bottles containing one pint, half-a-pint, or less." Instead of the present requirements it is proposed that a fluid ounce weighing 446 grains should yield "not less than 3·5 grains," equivalent to not less than 1·88 per cent. of the official carbonate. To provide for the calcined residue being wholly magnesia, and to facilitate quantitative testing, it is recommended that LUNAN's proposal to titrate with official volumetric solution of oxalic acid should be adopted (see *Ph. J.*, lii., 619). In that case not less than 40 C.c. should be requisite for 100 C.c. of *Liquor magnesii carbonatis*.

In addition to the present official demand for 90 per cent. of potassium hydrate in "caustic potash," it is suggested that there should be an alcohol test for the exclusion of silicate, a ferrous sulphate test for exclusion of all but the faintest traces of nitrates and nitrites, and a lime water test to limit the amount of carbonate. Similar additions are recommended in regard to "caustic soda," and in view of the circumstance that the corresponding solutions are often made by dissolving the respective hydrates in water, those solutions should be required to stand the same tests.

This is the extent to which particular articles or preparations are mentioned in the report as requiring alteration of formulæ or further definition under the heading of characters and tests, and this part of the report may be considered of minor importance as compared with that having a more general bearing. Of primary interest in this latter respect are the views put forward as to the extent to which manufacturing processes for definite chemical compounds are to be retained in the Pharmacopœia. The tendency of modern times to transfer the production of such articles from the laboratory of the pharmacist to the factory of the manufacturing chemist is unquestionable, and it is equally certain that in many instances considerable advantages may thus be secured. It is, however, an essential condition of such a transfer of work that provision should be made for maintaining the individual responsibility of the pharmacist for the quality and character of the articles supplied by him or employed in the preparation, compounding, or dispensing of medicines. Without such provision the pharmacist would become a mere mechanical distributor of goods, whose quality he could not thoroughly guarantee, and the result would be that the essential characteristics by which the business of the pharmacist is distinguished from that of ordinary traders would be entirely obliterated. In the construction of the last two issues of the British Pharmacopœia the General Medical Council has recognised the fact that the inclusion of manufacturing processes was no longer essential, at least in regard to many chemical products. Identification and verification of composition by means of chemical analysis and physical characters has become possible to such an extent as to serve all the purposes of a personal guarantee as to the character of most chemical products employed in pharmacy and medicine. In such cases processes of manufacture have been omitted, and it has sometimes been left optional for the manufacturer to follow any process capable of yielding a product that will accord with the descriptions and tests given for its identification. Professor ATTFIELD submits that the time has probably arrived for a further extension of this procedure, and he suggests that as a rule the remainder of such official processes may now be altogether omitted from the Pharmacopœia. In a few instances, however, such withdrawal of processes may necessitate improvement of the definitions or some extension of the statement of characters and of the tests to be applied.

In the case of galenical preparations, however, it rarely happens that extracts, tinctures, or infusions, etc., admit of exact definition. Constancy of properties can therefore only be secured by rigid adherence to prescribed modes of preparation, and for that reason the retention of official processes for these products is considered to be still indispensably necessary.

On the subject of weights and measures the opinion is expressed that an extension of the alternative adoption of the metric system would be appropriate, and it is suggested that in place of the present defective system of "parts," equivalent statements of formulæ in terms of the metric system should be introduced into the new pharmacopœia. As the prospect of a general adoption of the metric system in this country is still remote, that plan would have the advantage of establishing a closer relation between the British Pharmacopœia and the pharmacopœias of other countries, without interfering with adherence to the British Imperial system of weights and measures.

The report concludes with a reference to the table of atomic weights in the current British Pharmacopœia, and discusses the question whether the slight alterations of numerical value which have resulted from modern experimental research should be adopted in the new issue. The quotation from the "Stas" lecture, by Professor MALLET, of the statement that "for everyday occasions approximate numbers are quite accurate enough," would appear to convey the reporter's opinion that the requirements of pharmaceutical practice would be satisfied in that way. But, at the same time, it is suggested that the table of atomic weights to be adopted in the new Pharmacopœia should represent alterations in rather more than one-third of the elementary bodies included in it, and also give a statement of the figures obtained experimentally, so as to show how far the officially selected atomic weights differ from the latest results of scientific inquiry. This proposal is not quite consistent with the purport of the quotation above mentioned, especially since the slightly altered values would not entail consequences of much importance for medical or pharmaceutical purposes, and also because the altered values may not be more exact. Moreover, since a pharmacopœia is not a work for guidance in research or for educational purposes, the convenience attaching to the use of fairly approximative round numbers is a point to be considered in regard to common purposes.

## PATENTS FOR MEDICINAL COMPOUNDS.

THE petition of the Pharmaceutical Society for the revocation of the "klorodine" patent was heard in the Chancery Division of the High Court of Justice on Tuesday, but, as in previous similar cases, the respondents assented to an order being made for revocation with costs. Accordingly, the case was not dealt with by the court on its merits. Counsel for the Society pointed out that the patent was taken out and the name chlorodyne spelt differently as soon as the sale of chlorodyne was attacked by the Treasury. The respondents protested however, that their application for a patent was perfectly *bonâ fide*, and that they only submitted to revocation because they found their process had been anticipated. Since their claim was virtually for the sole right to use glycerin for rendering homogeneous a combination of an alcoholic solution of chloroform, morphine, ether, and essential oil, this is not to be wondered at, and pharmacists will doubtless be surprised that any attempt should be made to pretend to exclusive rights in a method so commonly practised. Unfortunately, there is no scheme of supervision in force at the Patent Office, and it is greatly to be regretted that Letters Patent have been and continue to be granted in many other cases where the claim to novelty is equally lacking. This will be seen by reference to the list of applications made during the present year, printed at page 1012. Many of these have not been proceeded with further, and in the later ones the specifications have not yet been filed, but the essential features are given in a few instances, sufficient to reveal the absurdity of the system under which Letters Patent are granted. As the *Law Journal* remarks (see p. 1011), it is impossible to avoid asking why such patents have been granted at all, for the reception of fees ought not to be the entire function of the patent-giving authorities, and supervision should be exercised in such cases as the present at any rate, since the reckless granting of a patent might be made the means of putting poisons too readily into the hands of the public.

## DOCTORS IN SCIENCE.

THE statement made in last week's Journal under this heading should have been to the effect that the grace was presented, proposing that the honorary degrees as Doctor in Science should be conferred on Sir J. B. LAWES, F.R.S., and Sir J. H. GILBERT, F.R.S. The degrees will not be actually conferred, as at present arranged, until the occasion of the visit of the Royal Agricultural Society to Cambridge in June.

## CHEMISTS' ASSISTANTS' ASSOCIATION.

WE are asked to announce that the first of the monthly reunions to be held during the summer months by the members of this Association and their friends will take place on June 10, when [illegible] excursion will be made to Box Hill. Full particulars can be obtained from the Hon. Sec., E. W. HILL, 143, New Bond Street, W.

### INSTITUTE OF CHEMISTRY.

THE annual dinner of the members of the Institute of Chemistry of Great Britain and Ireland took place on May 25 at St. James's Hall, when nearly 140 gentlemen sat down, and the chair was aken by the President, Dr. W. J. RUSSELL, F.R.S. Those present included Lord KELVIN President, Royal Society), Sir J. EVANS Treasurer, Royal Society), Professor J. N. LOCKYER, Professor H. E. ARMSTRONG (President, Chemical Society), Mr. E. C. C. STANFORD President, Society of Chemical Industry), Mr. M. CARTEIGHE (President, Pharmaceutical Society), Dr. W. A. TILDEN, Mr. F. WILSON, Sir H. T. WOOD (Secretary, Society of Arts), Mr. A. GILES and Mr. E. FRANKLAND. Dr. W. A. TILDEN proposed "The Learned Societies," and deprecated the multiplication of subordinate societies. Lord KELVIN, in reply, spoke of the learned societies as all growing out of the parent society—the Royal Society. The co-operative societies had great work to do; and he saw no reason why an approved paper read before any other recognised earned society should not be printed in the Transactions of the Royal Society, Sir J. EVANS, in proposing "The President and Institute of Chemistry," expressed the opinion that a splendid work was being done by the Institute in the supply of properly trained analysts and chemical advisers. He wished the Institute every prosperity in the future. The President, in the ourse of his reply, reviewed the history and the present state of the Institute. Other toasts folowed, the speakers being Mr. E. C. C. STANFORD, Dr. E. FRANKLAND, the TREASURER, and Professor . N. LOCKYER.

### PRESENTATION TO SIR G. BUCHANAN.

SIR GEORGE BUCHANAN has been the recipient of handsome testimonial, upon the occasion of his tirement from the post of Medical Officer to the ocal Government Board. In accordance with his ish, a die has been prepared, and the balance of he £300 raised presented to the Royal Society for he foundation of a gold medal. This will be prented periodically to persons who have rendered stinguished service to the cause of public health, ther by their administrative ability or by original ork. The first gold medal has been presented to ady BUCHANAN, whilst Sir GEORGE has received copy in bronze, together with an illuminated list the subscribers' names.

### PHARMACY AS A PROFESSION IN AMERICA.

IN the valedictory address to the 1894 class of he Philadelphia College of Pharmacy, Professor P. SADTLER stated that the next change in the ollege course of instruction would be to lengthen to three years' obligatory work. Three years' stematic instruction, he urged, is none too uch for the minimum requirements of e present day, and a large number of udents in recent years have devoted that ngth of time to the purpose. The three years' urse will be obligatory on all candidates for alification as graduates in pharmacy, entering e College at the beginning of the autumn term 1895. The lecture work will be extended through ree courses of systematically graded instruction, and three thoroughly equipped laboratories will be open for instruction in the practical and manipulative work of the three main lines of study represented in the College. It is hoped that young men may thus be rendered fit to enter upon the practice of pharmacy as a profession. Whilst referring to this subject, it is worthy of note that, according to the *Western Druggist* for May, the number of college graduates in pharmacy in the United States is on the increase, and those graduating this year will probably reach, if not exceed, 1000. At the same time the number of individuals who will, in the same period, become registered as pharmacists by the state and territorial boards, without college training, is estimated at 8000, or just eight times the number of graduates.

### EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

WE are asked to intimate that this Association has resolved to hold a picnic on Wednesday, June 13, at Norham Castle, near Berwick-on-Tweed. It is proposed to proceed by special saloon carriages to Berwick *via* Dunbar, and drive to Norham Castle by the road on the Scottish side of the Border, about eleven miles, returning by the English side, about seven miles. Friends of members and any chemists sojourning in the district will be cordially welcomed. The company will assemble on the North-Eastern platform, Waverley Station, at 9.10 a.m., and return from Berwick by the train leaving at 7.16 p.m. Tickets may be obtained from Mr. CLAUDE F. HENRY, Honorary Secretary, 1, Brandon Terrace, Edinburgh.

### THE STUDY OF GERMAN.

IT is announced in *Nature* that arrangements have been made for holiday courses of instruction at Jena, with the idea of facilitating the acquirement of a knowledge of German by students of science. In an elementary course for those having little or no acquaintance with the spoken language, the subjects dealt with will include physiological psychology, school hygiene, and pedagogy. The classes will be conducted by experienced teachers, who will speak very slowly and clearly, and employ the German language exclusively as the medium of instruction. A more advanced course will also be held, Dr. STRAUBEL lecturing on the microscope; Professor DETMER on the fertilisation of plants and microscopic botany; Professor SCHÄFFER on experimental physics; Professor AUERBACH on modern physical demonstrations; Dr. KNOPF on time and its determination; Dr. STRAUBEL on electrical and magnetic measurements; Professor WOLFF on theoretical and practical chemistry; Professor ZIEHEN on physiological psychology; Dr. RÖMER on zoology; and Dr. GÄNGE on spectroscopic and polarising apparatus. An additional advantage of the courses will be found in the fact that German students will join the English ones in study, opportunity being thus afforded for improvement in conversational German as well as technical. The secretary of the committee arranging the courses, which will extend from August 1 to 23, is Mr. J. J. FINDLAY, of Rugby.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### Exeter Appeal Case.

In the High Court of Justice, Queen's Bench Division, on Friday, May 25, before Mr. Justice Cave and Mr. Justice Wright, the case of the Pharmaceutical Society *v.* Hornsey was heard.

This was an appeal from the judgment of the county court judge at Exeter on April 10, reported in the Journal at p. 868.

Mr. Crump, Q.C., and Mr. Grey appeared for the appellant, and Mr. Foote for the respondent.

*Counsel for the Appellant.*

**Mr. Crump** said: My Lords, this is an appeal from the county court at Exeter in a matter in which the Pharmaceutical Society of Great Britain were the plaintiffs, and Mr. Hornsey was the defendant. It was an action brought under an Act to regulate the sale of poisons and to amend the Pharmacy Act, 31 and 32 Vic., cap. 121. The claim was for two penalties for keeping open shop for the sale of poisons. The learned county court judge found that the defendant did keep an open shop, and did sell poisons, but inasmuch as the open shop did not disclose externally that poisons were sold internally, he held that was not keeping an open shop for the sale of poisons. That would be a very ingenious way of evading the Act of Parliament, because a man has only to fill his front window with boots, and he can sell any amount of poisons inside. The learned county court judge said that because he did not advertise to the public that he was selling poisons, but only that he was selling boots, or rather in this case it was clocks and watches, there could not be a verdict in this case. That is shortly the nature of the case.

Mr. Justice Wright: What reason did the county court judge give?

Mr. Crump: He thought there might be a conviction for selling, but because he did not advertise, because he had his window full of watches and clocks, and in fact carried on the business of a watch and clock maker, he could sell this dangerous poison in the shop, and could sell it to any person who asked for it, it being corrosive sublimate, which is a very dangerous poison indeed, and the two small bottles sold contain enough poison to kill thirty people. He admitted it was a mischief against which the Act of Parliament was directed, and he said he might have convicted him for selling, but he could not convict him for keeping an open shop for the sale of poisons.

Mr. Justice Cave: You had better read his judgment.

Mr. Crump: Yes, my Lord. [The learned counsel read the judgment of the county court judge, *vide* p. 868.] My Lords, the facts are that the defendant kept an open shop, and that he sold this specific, which was a deadly poison, to anyone who came to purchase it at his shop. I do not know whether your lordships wish to hear the provisions of the Act of Parliament. The case of Eastwood *v.* Kenyon, which is referred to in the judgment, was the case of an order made in a judge's room, and the court held that that was not an open court.

*Counsel for the Respondent.*

Mr. Foote: My Lords, the provisions of the Act of Parliament have a great deal to do with this case, they show the object of the section imposing penalties, and they show the reasoning of the learned county court judge as to the objects of the Act, and I should like to call attention to those provisions. The Act is the 31 and 32 Vic., and the preamble says, "Whereas it is expedient for the safety of the public that persons keeping open shop for the retailing, dispensing, or compounding of poisons, and persons known as chemists and druggists, should" be duly qualified. Then the first section is: "From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title "chemist and druggist," or chemist or druggist, or pharmacist, or dispensing chemist, or druggist, in any part of Great Britain, unless such person shall be" qualified. That is not the section which imposes the penalty, but which makes the act charged unlawful, and that section clearly is directed, not against the mere offence of selling that which it is unlawful to sell, but it is directed against the practice of people holding themselves out to the public as medical practitioners. The section which co-relates to that, if I may use the expression, which imposes the penalty, is section 15. Section 15—although it does not refer in terms to that section—follows the same words: "From and after the 31st day of December, 1868, any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist, not being" a qualified person, shall be liable to a penalty, and so on. The offence there is, not selling in an open shop, but it is keeping an open shop for a particular purpose.

Mr. Justice Wright: It is "selling or keeping."

Mr. Justice Cave: Selling poisons or keeping open shop for selling them.

Mr. Foote: With great respect, my Lord, there is no accusative which corresponds to "sell."

Mr. Justice Cave: Yes, "sell poisons," that is the accusative which does correspond.

Mr. Foote: "Any person who shall sell or keep an open shop"——

Mr. Justice Cave: Sell what?

Mr. Foote: If it is poisons it makes it an offence to sell poisons anywhere, and that is what the learned judge said. That might be legitimate, but so far as the words "open shop" are concerned, it is "keep an open shop for the retailing, dispensing, or compounding poisons." The words "open shop" are not connected with the word "sell" in any way.

Mr. Justice Cave: No.

Mr. Foote: Therefore it is keeping an open shop for the retailing of poisons.

Mr. Justice Cave: That is, keeping an open shop where you retail the poisons to anybody who asks for them.

Mr. Foote: With great respect, it does not say so. It says "keep an open shop for the retailing."

Mr. Justice Cave: That is, keeping an open shop where you do retail.

Mr. Foote: Is that the same thing?

Mr. Justice Cave: Certainly. It is rather more in point of fact, because you may keep a shop for retailing it without retailing a single ounce.

Mr. Foote: That is what the learned judge pointed out. He thought the defendant might have been convicted under this section for selling.

Mr. Justice Cave: So you might without any sale. But here you have a sale, which shows that he did keep the open shop for retailing, and does retail.

Mr. Foote: But you have not got a sale in a place pointed out by the Act.

Mr. Justice Cave: This is an open shop, a shop which anybody might go into.

Mr. Foote: But it is not an open shop for the retailing of poisons.

Mr. Justice Cave: Why not?

Mr. Foote: No more than if a man did it in his use. Could it be said that he kept his house for the rpose of retailing?

Mr. Justice Cave: That would be nonsense.

Mr. Foote: My Lord, it would not be nonsense, with eat respect. A man might conceivably, in order to ade the law, take a dwelling house—for example, it often done for the purpose of betting, and I dare say ur lordship has known of such cases.

Mr. Justice Cave: A shop is nothing more than a ace where you sell goods. An open shop is a place ere anybody may enter.

Mr. Foote: It is not sufficient, it should be an open op, and you should sell it there. The Act does not y that. It is directed against advertising yourself d holding yourself out to the world as a qualified emist.

Mr. Justice Wright: The difficulty about that is the ohibition about the selling—the bare fact of sale. at is the difficulty in your way.

Mr. Foote: With great respect, my Lord, that is not difficulty in my way. The learned county court dge said the plaint might have been amended so as charge a sale, and as a matter of fact that has been ne since, and proceedings have been taken against is same man for selling.

Mr. Crump: Not by us.

Mr. Justice Cave: Perhaps they thought they would p him, and were disappointed.

Mr. Foote: It would have stopped him, no doubt, if e offer held out by the county court judge had been cepted by the other side, but that was not in fact, appears by what the learned county court judge said. reed, selling in the street is an offence, but this par-ular section, or this part of the section, is not ected against selling in the street. He is not charged th selling in the street, or in his house. Take the ample of a man keeping an open shop of a large aracter in London, and being a man who carried out pills in his waistcoat pocket, and his friends uld buy them from him wherever they met him. uld it be said that he kept an open shop for the e of pills, the pills being in his waistcoat pocket, d being passed from hand to hand, if he happened be in the shop—there, and if he happened to be in street—there. There is another section which als with the selling, and that is section 17. That s: "It shall be unlawful to sell any poison, either wholesale or retail, unless the box, bottle, vessel, apper, or cover in which such poison is contained distinctly labelled with the name of the article, l the word 'poison.'" There is no doubt the man ld have been hit under that section. Of course, judge found as a fact that this was a poison, and t it was not labelled, as it should have been, oison," and, therefore, he could have been success-ly prosecuted under that section, but they have osen to go against him for keeping an open shop. I not want to read the judgment again——

Ir. Justice Cave: Pray spare us that, we have heard nce, you know.

Ir. Foote: I will not read the judgment again, and ill endeavour not to repeat what the learned judge d, but what I am instructed to submit to the court, l what does appear to me to bear some plausibility n it, is that this part of the section is not directed inst the act of unlawful selling. It is intended to tect the Pharmaceutical Society, and it is not in-ded to make the actual sale illegal—not this part it. This part of the section is directed against the ertising of himself to the public as a qualified per- when he is not a qualified person. The preamble ls with that: "Whereas it is expedient for the ty of the public that persons keeping open shop for retailing, dispensing or compounding of poisons, persons known as chemists and druggists"— l be qualified. That merely signifies that the evil to be prevented is holding yourself out to the public as keeping a shop for this purpose, and selling these goods. If not, the word "poison" might have been omitted altogether. What force is given to the word "poison;" if a person keeps a shop for selling he does as much harm to the public. The man who is harmed is the individual who purchases it from him, but he does not harm the public, because he does not hold himself out to the public. If a man sells secretly, he sells only to the person who is dealing with him, he is not injuring the public. The object of the Act is expressed to be for the safety of the public. I do submit respectfully that the same meaning cannot be given to the words "for the retailing." "An open shop for the retailing" cannot mean the same thing as an open shop where in fact poison is retailed; I mean there must be a difference. The learned county court judge has found the one, and refused to find the other. He has found it was an open shop, and, in fact, a sale took place there, but he has refused to find it was an open shop kept for the retailing of poisons, because, my Lords, with great respect, the phrase "keeping an open shop for the retailing" is exactly the same as "keeping for retailing of poisons an open shop." Can it be said that a man who keeps a watchmaker's shop keeps it for retailing poisons.

Mr. Justice Wright: Surely here the man did keep a shop for retailing poisons, although he did it with another business for which he kept the shop.

Mr. Foote: He might, my Lord; that might be so. He might keep the shop as a blind, and his real object in keeping the shop might be to sell poisons, not clocks.

Mr. Justice Wright: No, without going so far as that. If he kept a shop in good faith for both purposes, ostensibly one would be a boot shop, but the other really would be a shop for selling poisons.

Mr. Foote: I agree, if I may say so respectfully, he might keep it for both purposes, but he might keep it for only one purpose, and the fact that the sale of poisons was sometimes in the shop might be a matter which had no influence on him whatever in inducing him to keep the shop. At any rate it must be a question of fact—was the object of selling poisons part of the object for which he kept the shop? If the learned county court judge held that in the affirmative I should be out of court, and possibly he might do so. I will not say he might not do so on the evidence, but he has declined to do so. He has entered rather minutely into the nature of the business and the way it was carried on, and his finding amounted to this, that the shop was kept for watchmaking, and watchmaking only.

Mr. Justice Wright: I think not. He says, as far as the poisons were concerned, it was a secret shop, and not an open shop.

Mr. Foote: My Lord, I do not think that is quite it. I will not read the whole of it, but I will try to refer to his expression on that point. He says: "Here the defendant undoubtedly kept an open shop for the repair of clocks and watches, which latter he exposed in his window as an intimation to the public of his trade, and as an invitation to them to enter and entrust him with their clocks and watches to repair, and if it were an offence to keep an open shop for the repair of clocks and watches, he would undoubtedly have been guilty of the offence. With respect to the sale of his specific, he had nothing to show inside or outside of his premises that he dealt in such an article. He made up an old family recipe, which appears to have been known in the neighbourhood, and he sold it to those persons who applied to him for it." May I not put it as high as this, that there is nothing in the finding of the county court judge to support your lordships in saying that this question of fact, that the shop was kept for the sale of poisons, has been found by him against the defendant?

Mr. Justice Wright: That very passage you have read expresses it. He sold it to the public who applied for it in the shop.

Mr. Foote: He does not say in the shop. He sold it just as much in the street. The evidence is quite consistent with that. He sold it as much in the omnibus or in the train, or wherever he might be.

Mr. Crump: There is no evidence of that.

Mr. Justice Cave: It is quite immaterial. If a man goes about selling poisons in the street he cannot be punished for keeping a shop. That is obvious enough.

Mr. Foote: With great respect, if he kept a shop for that purpose, and failed to sell it there, and went into the street and did it, he could be convicted. Such a thing is not at all impossible, particularly on a fair day, or a market day. No doubt people do it; they go outside and sell what they cannot sell at home.

Mr. Justice Cave: That would not make him less liable for keeping a shop.

Mr. Foote: I agree, my Lord. It is not an offence to keep an open shop, or to sell poisons in it. What the Statute requires is, you should keep the shop for the sale of poisons. That question of fact, I submit, must be found by the judge, and he has declined to find it. He was not anxious to let off the defendant, because he says if the plaint had been amended it would be an undefended action. It is not sufficient to show that he has in fact sold the poison, and that he has in fact kept a shop, and that the sale took place in the shop. The offence is keeping the shop for retailing. It is true that there is very little in the finding bearing on that, but I strongly submit that that fact must be affirmatively found, and that here it is not only consistent, but it is the right inference to draw from the judgment of the learned judge, that in his opinion this shop was taken, and kept, for other purposes.

Mr. Justice Wright: It is an action.

Mr. Foote: It is an action for penalties.

Mr. Justice Wright: On one day was it?

Mr. Crump: Two separate days, my Lord.

Mr. Foote: My Lords, I was only saying what, perhaps, I have said already, that the proper inference from the finding of the learned judge in this case is this, that the purpose of selling poisons was not one which had any influence with the man in keeping the shop, that it was a mere accident, so to speak. Being the possessor of a shop he did sell poisons when in the shop, and when he was in the shop he sold poisons in the shop. If that is the legitimate inference from the judgment of the learned county court judge I submit he is quite right. You have, in order to convict under these circumstance, to find, not that there was a sale, but that there was a shop; not that the sale was in the shop, but that the shop was kept for the sale. My learned friend, Mr. Crump, referred to the authorities cited, and I agree that they have not very much to do with it. One was as to how far a window in London was an open shop. Some stress was laid on the amount of publicity, but I agree with my friend, that it has very little bearing on this case. The real object of the word "open" in this Act is sufficiently shown by the preamble. I submit that the word "open" means something in the nature of a notification to the public, and that that is only satisfied by connecting the word "open" with "for the sale." It must not only be an open shop, but it must be open for the sale of poisons. If it is open for the sale of poisons, there must be something to let the public know that poisons are there sold. This is, of course, a slightly different point from the other. First, I say it should be kept for the purpose, and the learned county court judge has negatived that by his finding. Secondly, I say it must be open for the sale of poisons, and it is not sufficient to keep an open shop for the sale of watches and sell poisons in it, and say that is equivalent to having a shop open for the sale of poisons, because the opening does imply something in the way of publicity or notification to the public that the goods can be bought or purchased there. Your lordships see in this particular case it was a sale to an informer—I do not use the word in any bad sense, but he happens to be an informer—Sergt. Crook. It would have taken place in the same way whoever Sergt. Crook asked for it. He went to him and told him his boy had knocked his knee, and somebody had recommended him to come to this man and ask him for the lotion. The evidence is that he used to keep this lotion by him, and that he constantly gave it away to poor people. I submit, with great respect, if that is true it may be as logically said that he kept an open shop for the purpose of giving away the lotion. It is obvious this was a very small incidental matter in his trade. The county court judge appears to have believed him when he said he gave it away, and it is not an impossible thing to happen in the country. However, Sergeant Crook, I suppose, was a gentleman for the time being of respectable exterior, and he made him a charge for it. But if in fact he did not keep this shop for the purpose of selling it, the fact that he was tempted to sell him a bottle of this stuff when then in the shop ought not to expose him to a penalty. I think I have said all I can say on the point. I submit the learned county court judge must find before he can give judgment for the plaintiffs that this shop is kept for the selling and retailing of poisons, and that your Lordships, with great respect, cannot supply that omission by saying he has found it was an open shop, and he has found that poisons were sold there, because those two things together do not make the same thing; they do not amount to a finding that it was kept for the sale of poisons.

Mr. Justice Cave: Mr. Crump, can you maintain the right to two penalties here? He did not keep two shops.

Mr. Crump: No, he did not.

Mr. Justice Cave: You are only entitled to *one* penalty.

Mr. Crump: I think so too.

### *Judgment.*

Mr. Justice Cave: I think this case is reasonably clear. The defendant kept a shop, and in that shop he retailed poisons. He used the shop for retailing poisons, and anybody was at liberty to go into that shop and ask for a poison, and if he did so he would be served with it, upon payment of the amount charged for it. I cannot understand what is "keeping an open shop for retailing poisons" if that is not. I have already indicated my opinion that as regards keeping open shop only one penalty has been incurred, but the county court judge should have given judgment for the plaintiffs for one penalty of £5, with costs.

Mr. Justice Wright: I am of the same opinion.

Mr. Crump: Your lordships allow the appeal, with costs.

Mr. Justice Cave: Yes, we direct judgment to be entered for the plaintiffs for £5, with costs in the court below.

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## PROCEEDINGS IN THE COURT OF CHANCERY.

### REVOCATION OF A PATENT FOR A MEDICINAL PREPARATION.

In the Chancery Division of the High Court of Justice, on Tuesday, the 29th ult., Mr. Justice Stirling heard a petition presented by the Pharmaceutical Society for the revocation of Patent No. 16,496, A.D.

1892, the "complete specification" of which is as follows:—

*A Medicinal Compound.*

We, Thomas Kay, of Moorfield, Stockport, Chemist, George Arthur Shaw, of 112, Bramall Lane, Stockport, Chemist, and Kay Brothers Limited, of St. Petersgate Mills, Stockport, Manufacturing Chemists, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

A new and improved method of preparing the medicinal compound known as "chlorodyne," whereby it is formed into a solution which does not separate into different parts.

By this means we avoid the danger which exists in the administration of it without previous agitation. We thus provide for greater safety in the case of this medicine, and in order to fix the distinction between the two preparations we spell it thus—"klorodine."

Our invention consists in producing a solution, instead of a mechanical mixture, according to the following formula:—We take of

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| Chloroform - - - - | 120 fluid parts |
| Ethyl alcohol - - - | 300 " " |
| Ether - - - - - - | 30 " " |
| Essential oil of peppermint - | 1 " " |
| Hydrochlorate of morphine - | 2 parts |
| Glycerine - - - - | 240 fluid parts. |

We dissolve the hydrochlorate of morphine, essential oil of peppermint, chloroform and ether in the ethyl alcohol, and add this alcoholic solution to the glycerine, in which it is soluble, and so we form a perfectly homogeneous liquid.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:

The homogeneous combination of an alcoholic solution of chloroform, morphine, ether, and essential oil with glycerine.

Dated this 15th day of February, 1893.

Thomas Kay; George Arthur Shaw; Geo. A. Downs, Secretary, for Kay Brothers, Ltd.

Mr. Roger Wallace (instructed by Messrs. Flux, Thompson, and Flux) appeared for the petitioners, Mr. Lawson for the respondents.

Mr. Wallace: May it please your lordship, this is a petition for revocation of Letters Patent No. 16,496, of 1892, granted to Thomas Kay, of Stockport, and George Arthur Shaw, and Kay Brothers, Limited, of the same town. The patent is for "a new and improved method of preparing the medicinal compound known as chlorodyne, whereby it is formed into a solution which does not separate into different parts. By this means," the patentees say, "we avoid the danger which exists in the administration of it without previous agitation. We thus provide for greater safety in the case of this medicine, and in order to fix the distinction between the two preparations, we spell it thus—klorodine." The claim is for the "homogeneous combination of an alcoholic solution of chloroform, morphine, ether, and essential oil with glycerine"—glycerine being added to make it miscible. My Lord, Mr. Lawson appears for the respondent, and he assents to an order being made for the revocation of the patent. We have drawn up minutes which have been agreed upon. Shall I read them to your lordship?

Mr. Justice Stirling: Yes.

Mr. Wallace: "Upon hearing the petition of the Pharmaceutical Society of Great Britain, and of Michael Carteighe, of 180, New Bond Street, in the county of London, pharmaceutical chemist, and chemist and druggist, preferred unto this court, and upon hearing counsel for the petitioners and for the respondents, Thomas Kay, George Arthur Shaw, and Kay Brothers, Limited, and upon reading the said Letters Patent No. 16,496, of the year 1892, and the said Thomas Kay, George Arthur Shaw, and Kay Brothers, Limited, by their counsel consenting, order that the said Letters Patent No. 16,496, of the year 1892, granted to the said Thomas Kay, George Arthur Shaw, and Kay Brothers, Limited, be revoked. Order that Thomas Kay, George Arthur Shaw, and Kay Brothers, Limited, do pay to the petitioners, the Pharmaceutical Society and Michael Carteighe, their costs of this petition, to be taxed by the Taxing Master."

Mr. Lawson: My Lord, I now appear for all the respondents, and since the petition was before your Lordship we have had an opportunity of looking at the objections which were put forth by the petitioners, and we have examined some of the articles said to be prior users. Although we thought we had made a good discovery, we found that the prior users, if not exactly the same thing, showed such anticipation that it would be hopeless to attempt to support the patent. My clients also desire me to state that the suggestion which appears to be made in the petition, that this patent is not *bonâ fide*, but was intended for the purpose of enabling poisonous mixtures to be sold by unlicensed persons, has really no foundation. We thought we had made a *bonâ fide* good discovery, and, if it had been a new discovery, it would have been a valuable thing, but, unfortunately, we find we have been anticipated, and therefore we do not wish to trouble the court further.

Mr. Wallace: As representing the Pharmaceutical Society, all I have to say about that is this. That as soon as the sale of chlorodyne was attacked by the Treasury this patent was taken out, and chlorodyne was spelt with a "k."

Mr. Lawson: I have no knowledge of that whatever, and of course there is no evidence of it at all. I repeat what I have said, that the application was perfectly *bonâ fide*.

## POISONING CASES AND INQUESTS.

### Unprofessional Conduct of a Chemist and Druggist.

Mr. A. Braxton Hicks, the Mid-Surrey coroner, held an inquiry on Friday, May 18, at Wimbledon, into the death of Elizabeth Lampert, aged 56, of High Street, Merton. Mr. Lampert, an ironmonger and smith, stated that his wife had had good health down to three or four years ago. From that time she had been medically attended by Mr. Haynes, whom witness knew as manager to Dr. Coffin, of High Holborn. Mr. Haynes was a chemist, but he used to prescribe medicine for the deceased. On May 6, Mr. Haynes visited her, in response to a letter which witness wrote him. He stayed about a couple of hours, and left, after telling the deceased to remain in bed. Death took place on Saturday. On the same day witness's daughter went up to Mr. Haynes, who returned with her and, after seeing the dead body, gave the certificate produced. This witness handed to the registrar, who found that it was irregular, and the funeral had to be delayed until after the inquest. By the Coroner: At the time he engaged Mr. Haynes he was not aware that he was not a duly qualified medical man. He had paid him at the rate of half a guinea a visit.

Mr. Edward Haynes* stated that he was an associate of the Pharmaceutical Society, and carried on the business called "Dr. Coffin's Medical Botanist Consulting-room," in High Holborn. Dr. Coffin had been dead twenty-seven years. Witness became a qualified chemist in October, 1891. He considered deceased to be suffering from weak lungs, and he diagnosed her as being consumptive. After her death he wrote out the certificate produced, signing it "Edward Haynes, A.P.S." He knew that "A.P.S." was only a chemist's qualification, but he believed chemists all over the country gave certificates. By the Coroner: He knew that registrars of deaths were not supposed to accept certificates given by unqualified men, but they did take them to his knowledge. He got the certificate in question from among some which Dr. Coffin had. He did not know whether Dr. Coffin was a qualified medical man, nor did he know that that form of certificate had been obsolete for twenty-five years. He believed the certificates were handed over with the business. He had filled up one about four months ago, and it was accepted by a registrar off the Tottenham Court Road. Before he attempted to practise he had no medical training at all. Dr. Thomas Brushfield, who made a post-mortem examination, ascribed the cause of death to heart and kidney disease, following hæmorrhage from the lungs. An ordinary medical man could certainly have detected the kidney and heart trouble, and probably treated the patient for it. The jury returned a verdict in accordance with the medical testimony, and censured Mr. Haynes for giving the certificate. The coroner said he would report the facts to the proper authorities with a view to further proceedings being taken.—*Times.*

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* No person of this name is connected with the Pharmaceutical Society of Great Britain.

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### DEATH FROM AN OVERDOSE OF COUGH MIXTURE

On Monday, May 28, Mr. Badcock, deputy-coroner, held an inquest at the Darlington Hospital on the body of a child named John William Alderson. The mother, Alice Alderson, Eldon Street, stated that deceased had a cold, and she got a bottle of cough mixture from Mr. J. Wilson, chemist. She gave him a dose. On Saturday morning she sent deceased upstairs for the bottle, but instead of bringing the bottle to her he took a dose himself, probably from five to six teaspoonsful. Deceased was very sick previous to taking the mixture. Deceased then went out to play, and about half-past eleven he came into the house, sat in a chair, and became drowsy. She got him to bed, and some time afterwards, noticing his changed appearance, she sent for Dr. Eastwood, who remarked "The child is dying," and ordered his removal to the hospital. Witness had been in the habit for the last twelve months of giving the child the mixture when he had a cold.

John Wilson, chemist, North Road, said the mixture contained one-twelfth of a grain of morphine in each drachm—that was a teaspoonful. The other ingredients were quite simple. The mixture was a pleasant one to take, and was perfectly harmless when administered properly. When supplied for children he was always careful to explain how it should be administered. He exercised every possible care in those cases. Mr. Coatsworth, whom he succeeded in business, sold the mixture for twenty years, and he had sold it for twelve, and this was the first thing of the sort that had occurred. The coroner suggested to Mr. Wilson that it would be safer if he added to the label that the mixture contained a preparation of morphine, and should be used with care. Mr. Wilson agreed with the suggestion. If deceased got six drachms it would get a little more than an adult non-poisonous dose.

Dr. Yuill, the hospital surgeon, said had the child been attended to soon after it had taken the mixture the poison might have been removed from the stomach and the child saved. He could not say that death was due to morphine poisoning, as other complaints might be hidden by the effects of the poison.

The jury returned a verdict of accidental death fr morphine poisoning, and wished a recommendatio be made to all chemists that no mixture contain morphine should be sold without a label setting fo the fact being attached to the bottle.—*Northern E*

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### DEATH FROM OVERDOSE OF LAUDANUM.

The district coroner held an inquest at the Fox a Hounds Inn, Carlton, on May 28, on the body Walter Evelyn Wykes, three months old, son William Wykes, of 2, Ashwell Street, Netherfie Mary Rebecca Wykes, mother of the child, said th on Friday afternoon deceased had the stomach ach and she gave it a dose of what she thought was mixture of laudanum and syrup of rhubarb, but whic she found soon afterwards was laudanum alone. Immediately on discovering this she sent for a docto but the child died about twelve hours after. Dr. Jas Sutherland, of Netherfield, stated that he was calle to see the deceased child about 7.30 on Friday nigh He found symptoms of laudanum poisoning, and i his opinion that was the cause of death. Willia Deacon Wykes, the father, said that some time ag he fetched his wife some laudanum for the toothache. There was some mixture in the bottle when he took it to the chemist, which he threw away. The chemist did not ask him what he wanted the laudanum for, nor did he change the label, which had the inscription of "Syrup of Rhubarb and Laudanum." He did not tell his wife that he had had the mixture changed. Mrs. Wykes, recalled, said she looked at the label on the bottle before giving the child the dose. Alfred James, chemist,* of Netherfield, stated that the bottle bore his label. He did not remember serving Mr. Wykes with the laudanum. If he had done so he would certainly have obliterated the label and put a proper laudanum label on the bottle.—After a short deliberation the jury returned a verdict of "Death through misadventure."—*Nottingham Guardian.*

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### CARBOLIC ACID POISONING.

On Saturday, May 19, an inquest was held by Mr. T. E. Sampson, coroner for Liverpool, regarding the death of Harriet Bethell, aged 37, the widow of a seaman. It was stated that the deceased was addicted to habits of intemperance, and for the last two years had lived in Great Newton Street with a warehouse porter named William Parry. She went home intoxicated on Friday night, and drank a quantity of carbolic acid from a bottle that was in the house. She was taken to the Royal Infirmary, where she died the same night. The jury came to the conclusion that death was due to misadventure.—*Liverpool Mercury.*

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### ACCIDENTAL POISONING BY CARBOLIC ACID.

On Saturday, May 19, John Rich, High Street, Shoreham, on returning from the chemical works where he was employed, complained to his wife of having a nasty taste in his mouth, and said he would rinse it out with vinegar. He took down what he thought to be the vinegar bottle from a shelf, and took a gulp. He immediately exclaimed that he had taken acid, and his wife at once ran for assistance. An emetic of mustard and water was given to Rich, but when Mr. C. M. Kempe, surgeon, arrived within five minutes from the time he received the message, life was extinct. The supposed bottle of vinegar, Mr. Kempe found, contained carbolic acid.—*Sussex Daily News.*

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* No person with this name and address is on the Register of Chemists and Druggists for 1894.

## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

### ADULTERATED DRUGS AT BIRMINGHAM.

At the Birmingham police court, on May 18, Messrs. Holloway Brothers, chemists* and drysalters, of Ludgate Hill, were mulcted in penalties of 60*s.* and costs and 20*s.* and costs, respectively, for selling syrup of rhubarb adulterated with 20 per cent. of added water, and nitrous ether 46 per cent. below its proper strength. Dr. Showell Rogers, who defended, argued that in the latter case it was absolutely impossible to comply with the law, as the spirit was of such a volatile nature.—*Birmingham Argus.*

## PROCEEDINGS UNDER THE MEDICINE STAMP ACT.

### PENALTY FOR NOT STAMPING MEDICINE.

George William Raynes, chemist,* Station Street, Cogan, appeared before Mr. W. B. Gibbs and Colonel Guthrie, at Penarth police court, on Monday, May 21, charge with unlawfully exposing for sale a bottle containing medicine liable to stamp duty. J. Beer and W. B. Whitelaw proved the case on behalf of Somerset House authorities, the latter stating he bought a shilling bottle of "curative syrup" of the defendant. The bottle was unstamped. Defendant pleaded guilty, but said he did not know he was liable to stamp duty. The Bench said Raynes was liable to a penalty of £20 and costs, but they would this time only fine him 20*s.* and costs.—*South Wales Standard.*

## Reviews and Notices of Books.

PRACTICAL HISTOLOGICAL BOTANY. By FREDERICK DAVIS, B.Sc. Pp. 66, with illustrations. 2*s.* net. (John Gower, London).

The only valid reason for noticing this book is to utterly condemn it and the system which encourages the multiplication of such mischievous publications. The two desiderata that should be borne in mind by writers on science—a thorough grasp of the subject under consideration, and the power to describe and explain phenomena clearly in suitable language—appear to have been quite lost sight of in the present instance. As a consequence, practical botanists will probably be astonished by the curious information here imparted, and students who may be so unfortunate as to study from this tainted source will be both puzzled and misled. Thus, the author sagely remarks that "diverging light" is obtained "when the rays are reflected by a plane mirror" (p. 9). Then, though the fact that needles vary in thickness and may be straight is well understood, it is difficult to conceive of any practical advantage accruing from "some being circular" (p. 10). Conviction is wanting, too, when the reason why yeast contains no chlorophyll is succinctly stated in pseudo-syllogistic form, as follows:—

"Yeast cells will grow and propagate as well in the dark as in the light.

"Chlorophyll is developed only by the influence of light.

"It is apparent from this yeast contains no chlorophyll" (p. 22).

Fungi are said to be distinguished "from all other forms of plant life" by absorbing oxygen and exhaling carbonic acid gas (p. 26); yeast is to be examined with a "one-inch objective" (p. 27); and cell-sap is stated to be "developed from the protoplasm" (p. 31). How a "supernatant fluid may be . . . . . dried between folds of blotting paper" it is difficult to comprehend, but not more so than the statement that when so dried "and examined with the one-quarter inch objective, it will be found to be pure starch" (p. 34). Further on in the work, English rhubarb root is said by the author to contain no raphides. "By chewing a little rhubarb, therefore, we can tell by its gritty character between the teeth whether it be English or not" (p. 35). Sclerenchyma, we are also told, "would appear to be an intermediate state of transition from parenchyma to prosenchyma" (p. 37), and "vessels are formed by a combination of vesicular cells, that is, by the partial or entire breaking down of the cell-walls, the union of the cells thus taking place" (p. 39). After a reference to laticiferous vessels as being "intimately acquainted with sieve tubes" and containing "a nutrient fluid called latex," it is stated that "vesicular vessels are of a similar type, but in addition to containing latex, they are possessed of acicular crystals" (p. 40). In chapter vii. there is some wonderful descriptive writing on the anatomy of the dicotyledonous stem, which must be read to be appreciated. Thus, a fine sense of humour is displayed in the statement that in the "centre" of the stem is found the pith or medulla, and "around" it stand the pith cells consisting of parenchyma. The analogy to the Irishman's definition of a tunnel as "a hole with bricks built round it," though indirect, is fairly evident. Subsequently, in the same chapter, the typical flower of the dicotyledons is described as having the calyx at the summit of the peduncle, and within it occurs "the corolla, composed of the vexillum, alæ, and carina" (p. 45). Moreover, in the description of the process of fecundation in flowering plants, it is stated that, when the "germinal cell" of the ovule absorbs the fovilla of the pollen grain, "immediately a convulsive movement may be observed, and a division of the germinal cells . . . . takes place . . . . and the ovule is thus converted into the seed" (pp. 51–2).

Space fails, however, for the relation of all the fictions and absurdities masquerading as facts in this Punch-like parody of a science primer, so many occurring on almost every page, or for detailed reference to the truly comical "diagrams drawn from nature" (*sic*). Of the latter, it is sufficient to suggest that the potato-starch granule (2) on page 32 is probably unique; and that the stereo-botanical idealisation of a transverse section of a fern frond (p. 43), the sketches of pollen grains (p. 47), and the placentation diagrams (p. 51) deserve to hold the record for representing things as they are not. If the letters after the author's name, on the cover and title-page of the book, indicate that he is a Bachelor of Science, one is bound to assume either that "practical histological botany" formed no part of the curriculum of study for the degree in his case, or that the tests of the university conferring the degree were lamentably deficient. At any rate, it is a gross mistake to write, print, publish, or buy such a book, and students who may seriously have recourse to its aid will certainly suffer in loss of time and lack of knowledge.

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* No person with this name and address is on the Register of Chemists and Druggists for 1894.

## Correspondence.

### THE PHARMACY ACTS AMENDMENT BILL.

Sir,—I think the contingency mentioned by your correspondent, Mr. H. W. Jones (Coventry), in your issue of May 12, constitutes a real danger, viz., that men failing to pass the "Minor," and being under the new Act "Associates" of the Pharmaceutical Society, will go into business, putting up the inscription "Associate of the Pharmaceutical Society" over the door. The public will have no idea but what such a man is properly qualified as a chemist, and will not realise that the word "Associate" denotes one who has passed the ordinary educational examination only. "SOUTHPORT."

⁂ Reference to the Society's Bye-Laws, section xvii., will show our correspondents that the danger suggested is not likely to cause any real difficulty, since it is there provided that any Member or Associate found guilty of any act or conduct which is contrary to, or subversive of, the interests of the Society, may, after proper investigation, be removed from the Society by the Council. Moreover, in such a case as suggested, the individual—by acting as a registered chemist—would be liable to penalties for infringing the provisions of the Pharmacy Act.—[ED. *Pharm. Journ.*].

### A CORRECTION.

Sir,—In your issue of May 26 I am made to refer to Mr. Warren in the few remarks I uttered on May 23 at the annual meeting. I was at such a long distance from the reporter that a mistake is excusable. The gentleman I named was Mr. Hyslop.

PERCY WELLS.

*26, Cambridge Gardens, North Kensington, W.*

### COMPOSITION OF BALSAM OF ANISEED.

Sir,—It appears from the report of the annual meeting of the Pharmaceutical Society published in your columns that the President thought it right to refer to "Powell's Balsam of Aniseed" and to alleged variations in the quantity of morphine contained in it. As the subject of the sale of this preparation is still under the consideration of the courts, we should have desired to have refrained from discussing it in the press; but the wide publicity given to the President's observations is calculated to cause misapprehension amonst many of our friends and customers. We therefore beg that you will give us the opportunity of stating that our preparation has been made from the same formulæ for upwards of seventy years without the slightest deviation, and the care in selecting the ingredients, coupled with the careful process used in compounding it, renders the suggested variations absolutely impossible. The only explanation we can assign for the differences in analyses is that the analyst must have made a miscalculation, a mistake easily made when determining so minute a quantity in an admittedly difficult analysis.

*London.* THOMAS POWELL, LD.

⁂ While inserting this letter for the satisfaction of Messrs. Powell, it is proper to state that the remarks made by the President at the annual meeting of the Society were based on the evidence given at the hearing of the cases reported in this Journal at pages 652, 655, and 677. It is also necessary to add that the particulars mentioned as to variation in the amount of morphine are quite independent of the point of law referred to as being still under the consideration of the courts, viz., whether a preparation admittedly containing morphine is a poison within the meaning of the Pharmacy Act?—[ED. *Pharm. Journ.*].

### THE "ROMANES" LECTURESHIP.

Sir,—May I point out that Dr. Weismann was the incumbent of the Romanes lectureship. He delivered address in the Sheldonian Theatre early in May, when Romanes was present.

*Oxford.* G. C. DRUC

⁂ An abstract of Dr. Weismann's lecture will be fo at page 1010.—[ED. *Pharm. Journ.*]

## Answers to Correspondents.

*R. L. Pickup.*—It is extremely doubtful if a perfe clear solution can be made by strictly following the scription.

*H. F. C.*—The change in colour is due to the actio the Tinct. Valer. Ammon. on the Tinct. Nucis Vom., cannot be avoided.

## Diary of the Week.

### MONDAY, JUNE 4.

*Society of Chemical Industry* (*London Section*), at 8 p.m.
"Experiments on the Strength of Leather," by W. G. Macmillan.
"Note on the Colour of Brass," by W. G. Macmillan.
"Distillation of Peat," by Dr. P. Dvorkovitch.

*Royal Institution of Great Britain*, at 5 p.m.
General Monthly Meeting.

### TUESDAY, JUNE 5.

*Pharmaceutical Society of Great Britain.*
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.

*Royal Institution of Great Britain*, at 3 p.m.
"The Modern Microscope" (third lecture), by Rev. W. H. Dallinger.

### WEDNESDAY, JUNE 6.

*Pharmaceutical Society of Great Britain*, at 11 a.m.
Meeting of the Council.

*Edinburgh Chemists', Assistants', and Apprentices' Association.*
Botanical Excursion to Arthur's Seat. Meet at Holyrood Gate at 6 a.m.

### THURSDAY, JUNE 7.

*Royal Institution of Great Britain*, at 3 p.m.
"Egyptian Decorative Art" (third lecture), by W. M. Flinders Petrie.

*Linnean Society*, at 8 p.m.
"On Stipules and the Protection of Buds," by Sir John Lubbock.

*Royal Society*, at 4 p.m.
Election of Fellows.

*Chemical Society*, at 8 p.m.
Ballot for the Election of Fellows.
"The Nature of Phosphorescence," by Herbert Jackson.
"The Crystallography of the Normal Sulphates of Potassium, Rubidium, and Cæsium," by A. E. Tutton.
"The Boiling Points of Homologous Compounds Part II.," by Dr. James Walker.

### FRIDAY, JUNE 8.

*Royal Institution of Great Britain*, at 9 p.m.
"The Newtonian Constant of Gravitation," by C. V. Boys.

### SATURDAY, JUNE 9.

*Royal Institution of Great Britain*, at 3 p.m.
"The Stage and Society" (third lecture), by R. W. Lowe.

*School of Pharmacy Students' Association.*
Botanical Excursion to Hadley Woods. Leave King's Cross at 2.7 p.m. for Barnet.

*Pharmaceutical Cricket Club v. Hadley Junior Cricket Club*, at Barnet, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Attfield, Cocks, Griffiths, Henry, Hill, Johnston, Lowther, Meldrum, Mumbray, Powell, Russell, son, Umney, Warren.

# SALTERS' COMPANY RESEARCH FELLOWSHIP.

## REPORT OF THE RESEARCH COMMITTEE.

The Research Committee has to report to the Council that it has received with much pleasure from the Court of the Salters' Company the following regulations relating to the award of the Salters' Company Research Fellowship. These regulations the Research Committee has unanimously accepted, and are as follows :—

*Rules and Regulations for the award of the Salters' Company Fellowship for the encouragement of higher Chemical Research.*

1. The subject of the Fellowship shall be chemistry considered especially in its relation to pharmacology, that is, the application of the newest methods of scientific chemistry to the elucidation of pharmacological problems.

2. The Fellowship shall be of the annual value of £100, and shall be tenable for not more than three years in succession, except by special permission of the Court of the Salters' Company. If a Fellow who has already held the office for one or two years desires to be re-elected, he shall renew his application each year, and his nomination shall be subject to his work having been carried on to the satisfaction of the Director of the Research Laboratory. The Fellow elected shall devote his whole time to research in the Research Laboratory of the Pharmaceutical Society, under the supervision of the Director, and he shall not hold any other office or appointment except by special permission of the Court of the Salters' Company, granted on the strong recommendation of the Director and of the Research Committee of the Pharmaceutical Society. Any person duly qualified in the methods of chemical research shall be eligible for selection, preference being given to a candidate who has already worked for one or more sessions in the Research Laboratory.

3. The nomination of the Fellow shall be made to the Court of the Salters' Company by the Research Committee of the Pharmaceutical Society, on the recommendation of the Director of the Research Laboratory, who shall adopt any method he shall consider desirable to test the fitness of a candidate. The election of the Fellow shall be made by the Court of the Salters' Company, which meets on the first Thursday in October of each year.

True Copy.

EDW. LIONEL SCOTT,
Clerk of Salters' Company.

The Committee will proceed to the selection of the Research Fellow at their meeting on July 3, and requests that written applications for the Fellowship may be sent to the Director of the Research Laboratory before June 30.

# DIGESTION IN PLANTS.

## LOCALISATION OF VEGETABLE ENZYMES.*

BY PROFESSOR J. R. GREEN, M.A., D.SC.,
*Professor of Botany to the Pharmaceutical Society.*

In the processes of nutrition in plants two essentially different modes of procedure have made themselves prominent. Constructive methods are most easily visible in the great majority of plants, but are intermittent. Necessarily, therefore, there must be a further accessory series of operations to supply the requisite pabulum when construction is in abeyance. Whilst the latter process is active, an excess of elaborated material is prepared, and the surplus deposited in the tissues temporarily, reservoirs of nutritive material of various kinds being found in many different regions. The utilisation of these materials involves processes of decomposition, complex substances being split up into more simple ones, capable of removal and immediate assimilation. In plants, as in animals, a process of digestion thus results, being effected by the agency of enzymes or ferments, which seem to be formed entirely with a view to the utilisation of the deposited reserve materials.

The determination of the distribution of the ferments is facilitated by first ascertaining where and in what forms the reserve materials are deposited, but in some cases the detection is difficult. Somewhere in the neighbourhood of these reserve materials, however, the enzymes may be expected to occur. The microscope will show their presence if any peculiarities of structure or distinctive reactions are associated with them, or they may be placed under such conditions as will lead to their action and the formation of recognisable products. Both methods are difficult, but both have also proved more or less successful in practice.

As regards the localisation of the ferment-containing tissue, in the simplest cases of secretion the ferment is formed in the same cell as its appropriate reserve material, and its presence will be evident on microscopical examination, after warming the tissue to about 40° C. for some time. In comparatively lowly vegetable growths, too, the enzyme is probably co-terminous with the cell protoplasm. In higher plants, however, more approach to specialisation is seen, though even among these there are conspicuous cases of a very wide distribution, as in the case of diastase.

As the result of prolonged and painstaking researches it has been made clear that the ferment and the glucoside on which it works are always enclosed in different cells. In roots they are distributed chiefly in the cortex, but sparsely in the wood. The pericycle and the tissue derived from it form their chief seat, the secondary bast coming next in order. They may also be found in the medullary rays and pith. In leaves the secreting cells occur throughout the mesophyll, but may be localised either there, in the pericycle, or in the bast of the veins, and occasionally occur in the endodermis of the bundles. In flowers secreting cells are contained in large numbers in both sepals and petals, but they are most numerous in the pulp of the fruit, whilst in seeds they may occur in the embryo and integument, in the parenchyma of the cotyledons, and in the lower epidermis when the cotyledons become green.

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* Abstract of a paper in *Science Progress* for June.

## BRITISH PHARMACEUTICAL CONFERENCE.

### MEETING AT OXFORD IN AUGUST, 1894.

*Subjects Suggested for Investigation.*

(*Concluded from page* 1010.)

31. *Chamomile.*—Research on the bitter principle contained in the flowers of *Anthemis nobilis.*

32. *Repercolation.*—This process of making fluid extracts and of exhausting drugs has attracted much attention, and is said to have yielded excellent results. A critical and comparative investigation is required.

33. *Castor Oil.*—A research, having for its object the isolation of the purgative principle, either from the oil or the seed.

34. *Musk.*—Examination of commercial specimens of natural and artificial musks.

35. *Solvents.*—The employment of acetone, benzol, petroleum ether (benzoline), and bisulphide of carbon, in the extraction and purification of active principles, oils, etc., is to be strongly recommended. Experiments are required to find out in what cases these liquids may be employed advantageously. (See Lefort, *Journ. de Pharm.*, 1869; also 'Year-Book of Pharmacy,' 1877, p. 253).

36. *Capsules.*—The quality of medicines in capsules. (See 'Year-Book of Pharmacy,' 1875, p. 285).

37. *Glycerin.*—Required, a good method of estimating this substance in pharmaceutical preparations.

38. *Dialysis.*—Report on the application of dialysis in pharmaceutical processes.

39. *Waste Products.*—The utilisation of waste products in pharmacy.

40. *Cotton-Seed Oil.*—Can this oil be used advantageously for any pharmaceutical purposes?

41. *Cascarilla Bark.*—A re-examination of this bark is desirable, and particularly with reference to the observation that it contains an alkaloid closely allied to choline. (See 'Year-Book of Pharmacy,' 1886, p. 168).

42. *India-Rubber Plasters.*—A formula for a rubber plaster basis is required.

43. *Cocoa-Nut Stearine.*—This substance is recommended as a basis for suppositories. Experiments are needed.

44. *Soap Basis.*—Can the employment of the soap basis used in the preparation of the B.P. "linimentum potassii iodidi cum sapone" be usefully extended to other preparations intended for external application?

45. *Standardised Tinctures.*—Certain pharmacopœial tinctures owe their activity to the presence of one or more resins. Is it possible to "standardise" any of these preparations?

46. *Concentrated Infusions.*—These are largely employed in medicine. Is it possible to make preparations of official drugs such as shall on dilution approximately represent the corresponding B.P. infusions?

47. *Compressed Drugs and Coated Pills.*—Required, a report on the strength and quality of compressed drugs and coated pills of commerce.

48. *Cascarin.*—It has been stated by Leprince ('Year-Book of Pharmacy,' 1893, p. 131, from *Comptes rendus*, cxv., 286–288) that the active constituent of the bark of *Rhamnus purshiana* is a crystalline principle, cascarin. This statement requires verification.

49. *Taraxacum.*—Little that is definite appears to be known regarding the active principle of taraxacum root. A research is required to clear up the point.

50. *Strontium Salts.*—Some specimens of salts of strontium met with in commerce contain appreciable quantities of salts of other bases. A report on the quality of commercial specimens is needed.

51. *Acetic Acid as a Menstruum.*—Acetic acid has been strongly recommended by F. Hoffman (Year-Book, 1893, p. 190), and also by Remington (*Pharm. Journ.*, [3], xxiii., p. 807), as a menstruum for the exhaustion of many drugs. An investigation is required to ascertain for what drugs it is suitable.

52. *Preservation of B.P. Waters.*—How may the development of fungoid growths in the B.P. waters be prevented?

53. *Solubility of Scale Preparations.*—It has been noticed that some scale preparations, notably the potassio-tartrate and ammonio-citrate of iron, become less soluble with age. To what cause is this attributable, and how may it be prevented?

54. *Purity of Pilocarpine.*—It is suggested that many specimens of pilocarpine contain jaborine as an impurity. Is this the case?

55. *Jaborine.*—Does this base exist ready-formed in jaborandi, or is it produced in the process of the manufacture of pilocarpine? Published evidence points to the latter as the more likely alternative.

56. *Colchicum Autumnale.*—A careful proximate analysis of the corm and seeds of *Colchicum autumnale* is urgently needed. The supposed active principle, colchicine, readily decomposes, yielding colchiceine and apo-colchiceine. It is desirable to ascertain what principle or principles really exist ready-formed in the drug. (*Vide* 'Year-Books of Pharmacy,' 1881, p. 218; 1882, p. 79; 1883, p. 93; and 1889, p. 65. For a useful epitome of the literature of the subject see 'U.S. Dispensatory,' 1890, pp. 485, 486).

57. *Official Soaps.*—A limitation is needed for the amount of water and percentage of alkali in the B.P. soaps.

58. *Essential Oils.*—Should not a statement of the boiling points and solubilities in alcohol of various strengths be incorporated in the official characters and tests?

59. *Nux Vomica.*—The extract from the seeds is generally too thin when standardised to 15 per cent. Would it not be advisable to introduce a dried and powdered extract of this strength?

60. *British Pharmacopœia.*—What modifications or amplifications of the British Pharmacopœia are advisable or necessary to secure recognition of an Imperial character?

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## APPLICATION FOR PATENT FOR A MEDICINAL COMPOUND.

9877.—An improved medicinal compound for the relief and cure of toothache and kindred ailments. By George Hamilton, of 12, Basinghall Street, London, E.C. May 21.

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

SATURDAY, JUNE 9, 1894.

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE COUNCIL MEETING.

THE first meeting of the re-constituted Council last Wednesday was attended by all the members except Mr. RICHARDSON, who, we regret to learn, is suffering from illness, and Mr. BOTTLE, who was summoned from town on the previous evening in consequence of the illness of a member of his family.

The first business proceeded with was the election of officers, and subsequently the appointment of committees. By the general desire of the Council, the positions of President, Vice-President, and Treasurer are again respectively filled by Mr. CARTEIGHE, Mr. CROSS, and Mr. HAMPSON. Mr. RICHARD BREMRIDGE was re-appointed Secretary and Registrar; Mr. J. R. HILL, Assistant Secretary; and Mr. HOLMES, Curator. Messrs. DOTT and JACK were appointed examiners for the Council Prizes Competition in July next, and Messrs. GERRARD, WHITE, and PINCHES to conduct the examinations for the JACOB BELL Memorial and Manchester Scholarships.

The PRESIDENT mentioned that letters had been received from Sir FREDERICK ABEL and Professor SYDNEY RINGER, acknowledging their appointment as honorary members of the Society.

The additions to the Society comprised three pharmaceutical chemist members, thirty-one associates, and forty-eight students.

The chief particulars mentioned in the report of the Finance Committee were the various receipts on account of the Benevolent Fund, bringing up the balance in hand to something more than will be required next month for the payment of annuities. The legacy of £100 left by the late G. B. FRANCIS has been received, and together with a donation from the Chemists' Assistants' Association added to the donation account. By the recommendation of the Committee a sum of one thousand pounds was directed to be paid to the chairman of the North British Branch on account of the Society's new buildings in Edinburgh, which are progressing satisfactorily under his direction.

On the recommendation of the Benevolent Fund Committee four grants of ten pounds each, two grants of fifteen pounds each, and one of twenty pounds were ordered to be paid. In moving the adoption of the report and recommendations the VICE-PRESIDENT drew attention to the case of one of the applicants who is desirous of obtaining some employment, in the hope that some members of the Society may be able to assist him in that direction. He also mentioned the case of FERDINAND ROBERT WILKINSON, who is a candidate for election to the British Orphan Asylum, and appealed to all connected with the Society for the support which is merited by the circumstances in which his mother is situated. This appeal was strongly endorsed by the PRESIDENT.

In reference to the delivery of a sessional address to the students at the opening of the school in October, Mr. SCHACHT suggested that the desirability of selecting someone belonging to their own body should be considered by the committee to which this subject was referred. He thought the process of education which had been going on for the last fifteen years should by this time have produced men equal to the performance of the duty, in the same way that medical schools and lawyers do not find a necessity of going outside their own bodies to secure representative men for such a purpose. This suggestion was supported by Mr. HARRISON as being a suitable instruction to the committee, in order to avoid the reproach of poverty of resource within the ranks of those engaged in the practice of pharmacy.

An application from the Secretary of the Chemists' Association at Plymouth for the grant of a materia medica cabinet was referred to the Library, etc., Committee. The application stated that the Association now numbers upwards of eighty members, half of whom are assistants or apprentices, and an account was given of the work which has been done by the Association.

In reference to the subject of the increased duty on spirit, the PRESIDENT mentioned that he had received a copy of a memorial addressed by the chemists of Burnley to the Chancellor of the Exchequer, as well as letters from Mr. CARLTON, of Peterborough, and the Secretary of the Manchester Pharmaceutical Association. These communications were considered by the General Purposes Committee, with the result that it was not found to be expedient to make any official recommendation to the Government on this matter.

In reply to an inquiry by Mr. MARTIN respecting the patenting of a medicinal preparation containing poison as an ingredient, the PRESIDENT stated that the subject has for some long time been duly considered. In the particular case to which Mr. MARTIN referred steps are being taken to contest the validity of the patent.

The report presented by the Research Committee (see p. 1025), setting forth the conditions under which the Salters' Company Fellowship will be awarded, was mentioned by the PRESIDENT as being the outcome of deliberations as to the mode in which the endowment was to be dealt with. In speaking of the generosity shown by the Salters' Company to other bodies, and its endeavours to find opportunity for doing good in various ways, he said that the Society should congratulate itself on the establishment of this Fellowship. In order to express the appreciation of the great assistance which has thus been rendered to pharmacological science by the Salters' Company, he moved that an official acknowledgment should be forwarded from the Council. The motion was seconded by the VICE-PRESIDENT, who expressed satisfaction at seeing the old Guilds of the City of London active in promoting the public good in accordance with the requirements of the time. This feeling was endorsed by the TREASURER and Mr. ATKINS, and the motion was carried unanimously.

Consequent upon a complaint received from Mr. FEAVER CLARKE, the Society's Local Secretary for Gravesend, as to charges that have been made against him by Mr. G. W. SARGENT in a manner calculated to be subversive of the interests of the Society, the PRESIDENT moved that the SECRETARY should be requested to call upon Mr. SARGENT for an explanation of his conduct, and the motion wa unanimously agreed to.

The report of the General Purposes Committee gave the usual information as to the progress and results of legal proceedings in cases of infringement of the Pharmacy Act. In reference to the report of a sub-committee upon the method of conducting the Society's examinations and the conditions under which the Boards of Examiners are appointed, it was decided to adopt the recommendations it made, and that the altered regulations proposed in the report should come into force in December next. Space does not admit of further reference to the details of this matter on the present occasion. The report of this sub-committee, which will be found at page 1033, relates to important adaptations of the Society's examination arrangements to suit existing requirements. The consideration of it, together with the discussion of the subject by the members of Council, cannot fail to be of interest to all connected with the business of pharmacy, and desirous of advancing the position of those engaged in it.

## THE SALE OF MEDICINAL PREPARATIONS CONTAINING POISON.

A MEDICAL correspondent writes to inquire whether a registered chemist is allowed by the Pharmacy Act, 1868, to sell preparations containing morphine, such as "cough mixtures," without labelling them with the word "poison" or making a record of the sale, as directed by the 17th section of the Act in regard to medicines dispensed. Our opinion is that a cough mixture containing morphine is to be regarded as a preparation of morphine or, it may be, of opium, and that being therefore, in either case, one of the articles named in the Schedule as poison within the meaning of the Act, it is necessary, in selling such an article, either to label it as directed in section 17 or, if it can be treated as medicine dispensed, to label it distinctly with the name and address of the seller, and also to enter, in a book kept for that purpose, a statement of the ingredients of the medicine, with the name of the person to whom it is sold or delivered. In this latter case the section referred to provides that none of its general provisions as to labelling shall apply to medicine so dispensed, nor to any article forming part of its ingredients. This alternative proceeding appears to offer persons registered under the Act some power to exercise their discretion as to which course they adopt in particular instances. But in any case of the sale or supply of medicine containing an article which is a poison within the meaning of the Act, it is requisite to comply with one or other of these alternative provisions. It must, however, be remembered that in treating such an article, when sold, as if it were medicine dispensed, the warning of the poison label against possible danger or negligence would not be supplied. Consequently, in the event of an accident, the seller might be less secure from blame than if he had followed the requirement of labelling with the name of the article and the word "poison." Some other aspects of this question are dealt with in a letter from Mr. J. ANDERSON RUSSELL, of Glasgow, at page 1043.

## PHARMACY AND CITY COMPANIES.

THE endowment of a Fellowship in connection with the Research Laboratory of the Pharmaceutical Society by the Salters' Company is a pleasing instance of recognition of the public value of the Society's work in a quarter where it might not have been supposed such work would have been noticed. The circumstance, however, is no doubt owing to the fact that members of the pharmaceutical body are also not unfrequently connected with some of the old City guilds. Thus, for instance, Mr. A. B. HILL has been master of the Salters' Company and several members of his family are connected with that Company. The position of master of one of these companies has now lost much of the significance it formerly possessed, but it is still a coveted distinction, and we may therefore take this opportunity of mentioning that at the present time Mr. CLIFFORD PROBYN is the master of the Patten-Makers Company. Besides being a member of the Pharmaceutical Society Mr. PROBYN has earned distinction as an officer of volunteers and is an active member of the London County Council.

### BRITISH ASSOCIATION AT OXFORD.

This year the opening meeting of the British Association will take place on Wednesday, August 8, that is, a week later than the Conference meeting, so that visitors to Oxford may easily arrange to attend both. The presidency will then be assumed by the Marquis of Salisbury, F.R.S., who will subsequently deliver the usual address. The following members have been nominated by the Council as presidents of the different sections:—Mathematical and Physical Science, Professor A. W. Rücker, F.R.S.; Chemistry and Mineralogy, Professor H. B. Dixon, F.R.S.; Geology, Mr. L. Fletcher, F.R.S.; Biology, Professor I. B. Balfour, F.R.S.; Geography, Captain W. J. L. Wharton, F.R.S.; Economic Science and Statistics, Professor C. F. Bastable; Mechanical Science, Professor A. B. W. Kennedy, F.R.S.; Anthropology, Sir W. H. Flower, F.R.S.; and Physiology, Professor E. A. Schäfer, F.R.S. Soirées will be held on August 9 and 14, and the concluding meeting on Wednesday, August 15.

### SCIENCE PROGRESS.

In the June number of this valuable publication Dr. A. K. Miller writes concerning the practical application of pure yeast in the brewery, and concludes that it cannot yet be claimed that the question has been definitely solved so far as English breweries are concerned. Electrosynthesis forms the subject of a paper by Dr. James Walker, F.R.S.E., and the results of recent research in this subject are summarised. Chemistry is represented by a brief description of recent work on the nature and functions of glycogen, by Dr. W. D. Halliburton, F.R.S.; mesozoic and kainozoic geology in Europe is discussed by Mr. Philip Lake, M.A.; and recent additions to our knowledge of the ancient sediments are considered by Mr. J. E. Marr, M.A., F.R.S. But the paper of greatest interest to pharmacists is that of Professor J. R. Green, M.A., D.Sc., embodying as it does the application of chemical knowledge to botanical research. A short abstract of this article is given at page 1025 of the Journal, but those specially interested in the subject will find the original well worthy of attention.

### MEDICAL MEN'S DISPENSERS.

A letter which appeared in the *Deal Mercury* last week points anew to the advisability of restricting dispensing in surgeries to properly qualified individuals. The coachman to Dr. J. W. Harrisson, of Sandwich, being thirsty, had asked the lad acting as dispenser for a glass of filtered water. What he actually received appears to have been a glass containing, besides the water, an ounce of "liquor strychniæ," and he was shortly afterwards found suffering from tetanic convulsions, jerkings of the limbs, and a choking sensation—the usual symptoms of poisoning by strychnine. After receiving prompt medical attention, however, the patient fortunately recovered.

### METHYLATED SPIRIT.

Retailers of this spirit and persons who use it for technical purposes will find the regulations surrounding its sale and use very clearly stated in a pamphlet by Mr. Algernon Warren (Arrowsmith, Bristol), published at a nominal price. As the writer points out, government control over the article is practically unavoidable in the case of methylated spirit. At the same time the restrictions can hardly, under the circumstances, be considered unduly burdensome, and a brief time devoted to the study of the information given in Mr. Warren's pamphlet should result in all difficulties being removed.

### PHARMACY IN VICTORIA.

In the report of the Pharmacy Board of Victoria, for 1893, received from the Secretary and Registrar, Mr. H. W. Shillinglaw, it is stated that 105 candidates presented themselves for the Preliminary Examination during the year; 46 for Chemistry and Practical Chemistry; 41 for Materia Medica and Botany; 22 for the Final Qualifying Examination; and 2 for the Modified. The numbers show an increase on previous years, and the candidates include students from New South Wales, New Zealand, Queensland, and Tasmania, who, after serving their apprenticeship in the various colonies, attended the courses of lectures at the Melbourne College of Pharmacy. On December 31 last the Pharmaceutical Register of Victoria contained the names of 796 pharmaceutical chemists.

### PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The volume recording the proceedings of this Association at the meeting held at Chicago, Ill., last August is slightly less bulky than its predecessor, but yet consists of nearly eleven hundred pages. It is prefaced by a short biographical notice of the late Professor Maisch, after which follows the report of the meeting and the full text of the papers read there. More than half of the volume, however, is devoted to the annual report on the progress of pharmacy, by Mr. Henry Kraemer. This is very comprehensive, and likely to prove of considerable value to anyone requiring to refer to records of recent work on subjects in any way connected with pharmacy.

### APPOINTMENT FOR DR. P. F. FRANKLAND.

We learn from the *Times* of Thursday last that the council of Mason's College, Birmingham, has appointed Dr. Percy F. Frankland, F.R.S., to the chair of chemistry and metallurgy, vacant through the resignation of Professor Tilden.

# Transactions of the Pharmaceutical Society of Great Britain.

## MEETING OF THE COUNCIL.

*Wednesday, June* 6, 1894.

Present—

Messrs. Allen, Abraham, Atkins, Carteighe, Cross, Gostling, Greenish, Grose, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Newsholme, Schacht, Southall, Storrar, and Young.

Mr. MICHAEL CARTEIGHE took the chair.

The minutes of the last monthly meeting and of the special meeting on May 23 were read and confirmed.

### ELECTION OF PRESIDENT.

On the ballot being taken in the usual way,

MR. MICHAEL CARTEIGHE

was re-elected President.

The PRESIDENT said he felt a difficulty in finding appropriate language in which to thank his colleagues for this further honour; he could only assume that they knew what they were doing, and must bow to their wishes.

### ELECTION OF VICE-PRESIDENT.

On a ballot being taken,

MR. W. GOWEN CROSS

was re-elected Vice-President.

The VICE-PRESIDENT, in thanking the members for this renewed mark of their confidence, said if he had consulted his own wishes he should have liked to retire and make room for someone else, but some of his friends were anxious that he should not state this publicly, and he had therefore allowed them to vote for him. He felt not only the honour but the responsibility of the position, and hoped he should be able to fulfil his duties satisfactorily.

### ELECTION OF TREASURER.

On a ballot being taken,

MR. ROBERT HAMPSON

was re-elected Treasurer for the ensuing year, and thanked the Council for this renewed mark of confidence.

### STANDING ORDERS.

The standing orders of the Council were re-enacted for the ensuing year.

### SECRETARY AND REGISTRAR.

Mr. RICHARD BREMRIDGE was re-appointed Secretary and Registrar for the ensuing year.

### EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. B. H. PAUL was re-appointed Editor, and Mr. JOHN HUMPHREY Sub-Editor, of the Journal for the ensuing year.

### CURATOR.

Mr. E. M. HOLMES was re-appointed Curator of the Society's Museum for the ensuing year.

### ASSISTANT SECRETARY.

Mr. J. R. HILL was re-appointed an Assistant Secretary of the Society for the ensuing year.

### EXAMINERS FOR COUNCIL PRIZES.

Messrs. DOTT and JACK were appointed to conduct the examination for the Council Prizes Competition in July next.

### EXAMINERS FOR THE JACOB BELL SCHOLARSHIPS.

Messrs. WHITE, GERRARD, and PINCHES were appointed to conduct the examinations for the Jacob Bell Memorial and Manchester Scholarships.

### HONORARY MEMBERS.

The PRESIDENT said letters of thanks for their appointment as honorary members had been received from Sir Frederick Abel and Professor Sydney Ringe

### ELECTION OF MEMBERS.

*Pharmaceutical Chemists.*

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

| | |
|---|---|
| Coverdale, George ............... | York. |
| Horrell, W. Foskett Edward... | Crediton. |
| Robinson, James Frederick ... | Stamford Hill |

### ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

| | |
|---|---|
| Dee, Arthur Henry............... | Wandsworth. |
| Dickinson, George ............... | Highgate. |
| Douglas, James Wellesley...... | Denmark Park. |
| Elliman, Edgar George......... | Chesham. |
| Harrison, William Killey .. ... | Peel Causeway. |
| Hemensley, Albert Palmer ... | Douglas. |
| Irving, Thomas Stableforth ... | Potton. |
| Judge, Edgar Harvey............ | Bourne. |
| Pirie, James Metcalfe ......... | Edinburgh |
| Riley, Alfred Thomas ......... | Bolton. |
| Roberts, William ............... | Chester. |
| Scott, Thomas...................... | Motherwell. |
| Scott, Walter Stanley ......... | Cockermouth. |
| Smith, William John............ | Newcastle-on-Tyne. |
| Stevenson, George ............... | Sutton-in-Ashfield. |
| Thomas, Owen Edward......... | Bangor. |
| Walton, Samuel Archibald ... | West Hampstead. |
| White, Sydney Bowring ...... | Newton Abbot. |
| Williams, Arthur Llewellyn... | Pembroke Dock. |
| Wybrant, Andrew ............... | London. |

### ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered, or paid, as Students, their subscriptions for the current year, were elected "Associates" of the Society:—

| | |
|---|---|
| Brown, Alfred ...................... | Leicester. |
| Cameron, John Mackintosh ... | Edinburgh. |
| Connan, Campbell Allan ...... | Crieff. |
| Davies, Herbert Paget ......... | London. |
| Elder, Alexander.................. | Edinburgh. |
| Ingram, Fred ...................... | Wisbech. |
| McFarlane, Malcolm ............ | Aberfeldy. |
| Newey, Thomas .................. | Chesterfield. |
| Quénet, George Alfred ........ | N. Shields. |
| Stringer, John Oswald ......... | Preston. |
| Thwaites, Alfred.................. | Ryde. |

### ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

| | |
|---|---|
| Atlay, Frederic Wilson ......... | Sowerby. |
| Billington, Thomas Herbert... | Liverpool. |
| Bowden, Harold .................. | Patricroft. |
| Breese, Andrew .................. | Carno. |
| Bullard, Archie .................. | East Dereham. |
| Clark, Henry Barton ............ | Gloucester. |
| Corfe, John Martin.............. | Maidstone. |
| Cox, William James ............ | Brierley Hill. |
| Crookham, Harry H. ............ | Kings Lynn. |
| Dannatt, Philip .................. | Hull. |
| Davies, Thomas .................. | Carmarthen. |

| | |
|---|---|
| Docker, James | Greenock. |
| Foote, Edmund George | Waltham Abbey. |
| Halstead, Harold Broughton | Rawtenstall. |
| Harrison, John | Cudworth. |
| Hearder, Henry Noel | Plymouth. |
| Henshaw, William Herbert | Macclesfield. |
| Hick, William Henry H. | London. |
| Jackson, William Frederick | London. |
| Jelly, John William | Pendleton. |
| Lloyd, Percy Ernest | Twickenham. |
| Lounds, William Beaver | Grantham. |
| Lunt, Godfrey Fairbairn | Manchester. |
| McBride, Wm. Alexander W. | Luton. |
| Maddison, Thomas William | Hebburn-on-Tyne. |
| Main, George Sinclair | Crosby. |
| Martin, Edwin George | Ingatestone. |
| Matcham, Alfred | Beccles. |
| Morgan, John | London. |
| Mortimer, William Henry | Taunton. |
| Nightingale, Donald Archer | London. |
| Peacock, Rudolph | London. |
| Pearce, Robert Edgar | New Quay. |
| Pickworth, George Boyer | Congleton. |
| Round, William Henry | Thornaby-on-Tees. |
| Slater, Ernest Henry | Whittlesey. |
| Smeall, William Francis | Jedburgh. |
| Smith, Ernest | Barnard Castle. |
| Snell, Edmund Henry | London. |
| Spilman, John James | Ripley. |
| Townsend, William Alfred | Bristol. |
| Trubshaw, James Harold | Uttoxeter. |
| Turner, Algernon Thomas E. | Shebbear. |
| Uttley, John Richard Sellars | Masborough. |
| Wellington, Charles John R. | Fowey. |
| Willock, Horatio Ernest | Tutbury. |
| Wingfield, Thomas Arthur | Bolton. |
| Wishart, John | Insch. |

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

### APPOINTMENT OF COMMITTEES.

The Council went into committee to consider the arrangement of the different committees, as the result of which the following appointments were made:—

*General Purposes.*—The whole Council. To meet on the evening before the meeting of the Council, and at such other times as may be necessary.

*Finance.*—The President (Mr. Carteighe), Vice-President (Mr. Cross), and Messrs. Abraham, Allen, Grose, Harrison, Hills, Martin, Martindale, Newsholme, and Schacht.

*Benevolent Fund.*—The President (Mr. Carteighe), Vice-President (Mr. Cross), and Messrs. Atkins, Bottle, Gostling, Greenish, Hampson, Johnston, Richardson, Southall, Storrar, and Young.

*Library, Museum, School, and House.*—The President (Mr. Carteighe), Vice-President (Mr. Cross), and Messrs. Allen, Atkins, Bottle, Greenish, Hampson, Hills, Martin, Martindale, Newsholme, Richardson, and Schacht.

*Law and Parliamentary.*—The President (Mr. Carteighe), Vice-President (Mr. Cross), and Messrs. Allen, Atkins, Bottle, Gostling, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Southall, Storrar, and Young.

*Research.*—The President (Mr. Carteighe), Vice-President (Mr. Cross), and Messrs. Greenish and Schacht, with Mr. Ekin, Professor Lauder Brunton, Professor Michael Foster, and Professor Frankland.

*Evening Meetings.*—The staff of the Society's School, the Editor, and Curator, were requested to assist the President and Vice-President in making arrangements for the Society's evening meetings in London.

### REPORT OF THE FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee), in moving the adoption of the report and recommendations, said there was nothing special to call attention to in the receipts. On the Benevolent Fund account £100 had been received in subscriptions, and £115 for ground rents, and the balance in hand, after paying £62 in grants, was £969. Though this looked rather a large sum, over £500 would be required next month for the payment of annuities, so that there would be none too much left. The donation account had been benefited by the receipt from the executors of the late Mr. G. B. Francis of £100. The sum of £1 16*s.* 6*d.* had also been received from the Chemists' Assistants' Association. The payments were of the usual character, and there was also a recommendation that £1000 be sent to the Chairman of the North British Branch on account of the Building Fund account. The work had been carried on with the greatest care, the Committee were paying great attention to the matter, and Mr. Ewing was devoting a considerable portion of his time to watching the interests of the Society in connection with the new building, so that there could be no doubt of the money being carefully applied.

The motion was unanimously adopted.

### REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to an associate from 1841 to 1846 (aged 67), who has had six previous grants of £5 each. His health is too bad to allow of his earning anything. (London).

£10 to an associate since 1869 (aged 51). Formerly in business, and now out of employment owing to defective sight. (Brighton).

£10 to a registered chemist and druggist (aged 85), who has had three previous grants of like amount. (Rhynie, N.B.)

£10 to a registered chemist and druggist and former subscriber (aged 62). Failed last year, after being in business thirty-six years. (Southampton).

£15 towards the maintenance of two little girls at school, the orphans of an associate. (London).

£20 to the widow (aged 49) of a registered chemist and druggist, to enable her and her two children to go to America, where she has friends to help her (London).

£15 to the widow (aged 39) of a registered chemist and druggist who died in 1888, to enable her to become a certified nurse. (London).

One application had not been entertained.

The VICE-PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. There was a long list of very deserving cases before the Committee, and consequently a large sum of money—£90—was voted, but none required special notice. Of course, further subscriptions were still urgently needed, but it was no use repeating appeals month after month. He could only hope that those who heard him or read his remarks would bear in mind that assistance was required, and that whatever was offered would be gratefully received and profitably dispensed. The Committee had the opportunity of interviewing one of the applicants, who unfortunately had been broken down at the early age of fifty-one, and he was glad to say that he could accept light employment and partially earn his own living, and he hoped if any members of the Society knew of such an opening where the man could be employed he would let the Secretary know of it, and he was sure he would be glad to enter into communication with him. Before sitting down he wished to bring another case before the members and all connected with the Society. He was informed that at the next election to the British Orphan Asylum, Mackenzie Park, Slough, Ferdinand Robert Wilkinson, aged eight years, was a candidate. His mother was the widow of a chemist, and with regard to her he could not do better than read a letter from Canon Fleming. This letter stated that she had been a teacher of cookery for more than seventeen years, during which time she had taught, at some forty schools, four hundred or five hundred girls a week, and had lectured on cookery in many towns. She supported her husband in his failing health until his death, but was now unfortunately quite broken down from over-work. It was impossible to add anything to such a recommendation as that, but he appealed to everyone who could do so to assist in this election.

The **President** said he desired to enforce this appeal so far as possible. Mrs. Wilkinson was a brave woman, who deserved every assistance which could be given her.

### REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

#### *Museum.*

The Curator's report had been received, and included the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| April . . . | Morning | 452 | 38 | 6 | 18 |
| | Evening | 53 | 6 | 1 | 2 |

Donations to the Museum had been announced (*Pharm. Journ.*, May 19, p. 969), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

#### *Library.*

The report of the Librarian had been received, including the following particulars:—

| | Attendance. | Total. | Highest. | Lowest. | Average. |
|---|---|---|---|---|---|
| April. . . . | Day . . | 358 | 28 | 7 | 14 |
| | Evening . | 116 | 10 | 2 | 6 |

| Circulation of Books. | Total. | Town. | Country. | Carriage paid. |
|---|---|---|---|---|
| April . . . . | 231 | 117 | 114 | £1 3*s*. 4*d*. |

Donations to the Library had been announced (*Pharm. Journ.*, May 12, p. 946), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the undermentioned works be purchased:—

*For the Library in London*—

Kerner and Oliver, Natural History of Plants.
Brothers, Manual of Photography.
Science Progress.

The **President** moved the adoption of the report, which was purely formal, and this was carried unanimously.

### THE SESSIONAL ADDRESS.

It was resolved that the selection of a gentleman to deliver the sessional address to the students in October should be referred to the Library, Museum, and School Committee.

Mr. **Schacht** said he would suggest for the consideration of the Committee the desirability or undesirability of selecting some gentleman belonging to their own body. He could not help feeling some humiliation in noticing that for fourteen or fifteen years they had chosen to apply to gentlemen outside their own body to give this address. During the first six or seven years when the address was given it was delivered by distinguished pharmacists, and Brady, Deane, Mackay, Stoddart, Sandford, Giles, Ekin, the late Mr. Southall, and Corder were names of which they might very well be proud, and those gentlemen fulfilled this function with great satisfaction and credit. Since then they had invited gentlemen of eminence in medicine and science to deliver the address, but during all these years they had been supposed to be educating themselves, and he could not help thinking that by this time they ought to be able to find men equal to the performance of this duty, and capable of addressing the students on the occasion of the commencement of the session. He did not find that the medical schools found it necessary to go very far out of their own body to find persons to deliver their inaugural address, nor did he think lawyers would go outside of their own profession to find a representative man for such a duty. He was bold enough to think they had men quite sufficiently cultured and skilful in every way to address the students with propriety and with credit to the body they represented.

Mr. **Harrison** said he took it that Mr. Schacht had moved an instruction to the Committee that it should consider the desirability of asking somebody connected with the craft to deliver the address in October, and if so he should have pleasure in seconding it. He thought, with him, that it rather betokened poverty of resource that year after year they should go outside their own body to select a person to deliver this address. He was of opinion that if the address were to be of the greatest value from an educational point of view, it would be very much better given by one of their own body, who would certainly be able to do as Goldsmith's parson did—point to brighter worlds—to a more useful and higher scientific life, and also able to lead the way. He thought if they selected someone engaged in the practice of pharmacy day by day to give this address to those who in future years would occupy their place it would be doing something to elevate the calling and point the young men the way to a useful and honourable career. He did not understand Mr. Schacht to say they were never to go outside their own ranks, nor did he, but they should show that they had men amongst them capable of performing this duty.

The **President** said the suggestion would no doubt be considered by the Committee. For some years past it had deliberately acted in the other direction.

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A letter had been received from the Secretary of the Three Towns and District Chemists' Association, Plymouth, asking the Council to consider the work which had been done there, and to provide them with a materia medica cabinet. The membership was over eighty, half of whom were assistants and apprentices, and a circular was enclosed stating the books possessed by the Association, the prizes offered, etc. He suggested that the letter be referred to the Library Committee, which was agreed to.

### DIVISIONAL SECRETARY.

The **President** said Mr. Hickey, Divisional Secretary for Chelsea, owing to failing health, desired to resign his appointment. Mr. Alfred Wigginton, of 137, Sloane Street, had been suggested as Mr. Hickey's successor, and he would, therefore, move that this gentleman be appointed Divisional Secretary for the Borough of Chelsea.

This was unanimously agreed to.

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The **President** said a letter had been received from the Honorary Secretary of the Nottingham and Notts Chemists' Association, thanking the Council for the gift of the *Pharmaceutical Journal* during the year and the Calendar.

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A letter had also been received from the Edinburgh District Chemists' Trade Association, enclosing a resolution approving of the draft Pharmacy Amendment Bill.

### INCREASED DUTY ON SPIRITS.

The PRESIDENT said a memorial had been received from the chemists of Burnley, a copy of which had been sent to the Chancellor of the Exchequer, with regard to the increased duty on spirits. A letter had also been received from Mr. Carlton, of Peterborough, to the same effect, and that morning one had been received from the Hon. Secretary to the Manchester Pharmaceutical Association. The petition from Burnley and Mr. Carlton's letter were considered by the General Purposes Committee on the previous evening, and after mature consideration the Committee recommended that a reply be sent to the effect that the Council did not think it expedient that any official recommendation should be made to the Government on the matter. This subject was of considerable difficulty in this country. Their brethren naturally felt irritated when an additional impost was put on this very important menstruum, and probably it was looked upon with greater dissatisfaction than some other things, because in some countries spirit was allowed to be used for medicinal preparations either at a less duty than usual or free of duty. It was well known to those interested in technical matters and manufactures that for some time there had been a series of attempts made to devise a scheme by which spirit could be used for certain purposes without paying duty, but it was found impracticable by the Government, and it was clear that if 6*d*, a gallon extra duty was put on spirit it was utterly impossible for the Government to exempt any class of consumers. It might be a wrong thing to suggest it, but it might be that eventually, as had been insinuated, the Chancellor of the Exchequer might think it desirable, if there was much opposition to this extra sixpence, to withdraw that clause and put an additional penny on the income tax. However, be that as it might, he must point out that it was not practicable for the Chancellor of the Exchequer of any Government to make an exception in favour of any particular class of consumers of rectified spirit. Besides this, the Committee was of opinion that it might not altogether be an advantage to the trade at large if spirit were actually obtainable duty free for medicinal preparations. There were many things underlying the business which would be affected, and it was not at all clear that a very cheap form of spirituous physic would tend to the improvement of chemists and druggists. He hoped the Council, therefore, would adopt the recommendation of the Committee. As far as he was personally concerned, no feeling on his part would prevent his attempting to do that which he was asked to do, but in this particular case he felt that they could not move with any advantage.

### POISONOUS PATENT MEDICINES.

Mr. MARTIN said he noticed in the last issue of a trade journal a reference to a patent which had been granted for a medicinal preparation, with a foot-note saying that the Pharmaceutical Council might regard it as a poisonous patent medicine, and, if so, it would know what to do. Perhaps the President would like to make a statement on the subject, because a great deal was done in Committee which the public knew nothing of, and it was not always advisable that they should; but as this matter had been publicly referred to, it might be as well to say if it was receiving attention.

The PRESIDENT said he could only assure Mr. Martin and the Council that every patent in any way connected with pharmacy was duly considered. The particular one referred to had been dealt with in the ordinary way some time ago, and steps were being taken to contest it.

### THE SALTERS' COMPANY FELLOWSHIP.

The PRESIDENT said the Research Committee had presented a short report, which he would read. This will be found printed at page 1025.

This report was the outcome of what was alluded to in the annual report of the Research Committee (see p. 838), and these documents would be placed amongst the archives of the Society, but he did not think the Council could do other than pass a vote of thanks to the Salters' Company for establishing this Fellowship. That Company was doing good in many ways, and had been recently looking about for opportunities of doing good in quarters sometimes lost sight of by other bodies in similar position. It had been generous to other educational bodies, to hospitals, and public institutions, and the fact that this Fellowship had been established was one on which the Society might well congratulate itself. He would move—

> "That this Council hereby returns thanks to the Master and Wardens of the Worshipful Company of Salters, and begs to express its high appreciation of the great assistance the Salters' Company has rendered to the science of pharmacology by the endowment of a Research Fellowship in the Society's Research Laboratory."

The VICE-PRESIDENT, in seconding the motion, said he should like to endorse what had been already said as to their gratitude to the Salters' Company for having taken up this matter. It had been said that if you had money to dispose of for the benefit of your fellow creatures in a charitable way, the conditions were so apt to change that in twenty years' time it was very doubtful if you did not do more harm than good. In this case he believed the Salters' Company had taken a step which would do lasting good. It was pleasing to see the spirit in which this was done—the spirit of the old-fashioned Guilds which had so often found expression in the city of London—with the object of securing the survival of the fittest. It was also very refreshing to find that being actuated by that spirit they went the right way to accomplish it. The regulations drawn up showed how thoroughly they appreciated the work the Society's Research Laboratory had already done, and also what it was likely to do in future. These regulations betokened an intelligent interest in what was going on; it provided that the same man might hold the Fellowship for three years, and showed that the idea was to select the best men and let them feel, when elected, that something was expected of them. Again, the value of method was evidently well understood by those who framed the regulations, as they indicated that preference should be given to well-trained men.

Mr. MARTINDALE said it was exceedingly appropriate that the Salters' Company, of all companies, should have given this grant, as their ancient charter would indicate they had been the Guild which had to look after the saline constituents that came to London.

Mr. HAMPSON said he hailed with hearty satisfaction the establishment of this Fellowship, but he believed he was right in assuming that it was possible that other persons than those who had worked in the Society's Research Laboratory would be eligible for the appointment, and he would rather emphasise the importance of allowing free scope of selection to the Committee. There might be promising, intelligent, and clever students in various parts of the country, and he should hope that, notwithstanding preference was to be given to those working in the laboratory, others would not be excluded.

Mr. ATKINS said, as the Society had spent a large sum in establishing this laboratory and in maintaining it, it was very pleasing to know that the value of the work was recognised. He did hear the other day that the work of this Research Laboratory was making its impression on outside bodies as being one of the very few doing that particular work. It was pleasing to know that the work was commending itself to bodies like the Salters' Company.

The resolution was carried unanimously.

Mr. Schacht suggested that it would be desirable that the terms of the Fellowship should be advertised.

The President said it was stated in the report that the Committee would proceed to the selection at the meeting on July 3. That would be published with the regulations, and an advertisement would appear in the Journal.

Mr. Hampson suggested the advertisement should also appear in the *Athenæum* and in the trade organs.

The President said the Council would, perhaps, leave the matter in the hands of himself and the Registrar.

### Alleged Misconduct of a Member.

The President read a letter from Mr. Feaver Clarke, local secretary for Gravesend, complaining of a certain letter (which he enclosed) which Mr. G. W. Sargent had sent to the goods manager of the South-Eastern Company at Gravesend, making sundry charges against him, and asking that some action should be taken by the Council in the matter. He said Mr. Clarke, in making this application, was acting within the bye-laws, and he would therefore move that the Secretary be requested to write to Geo. West Sargent, a member of the Society, asking him for an explanation of his conduct in issuing letters calculated to be subversive to the interests of the Society. Of course this simply was with reference to his position as a member, and would not preclude any further steps being taken.

Mr. Schacht asked if the power of expelling a member had ever been exercised.

The President answered in the affirmative.

The resolution was put and carried unanimously.

### Report of the General Purposes Committee.

The report of this Committee included the usual letter from the solicitors stating the progress made with cases placed in their hands. In some cases defendants having given an undertaking not to further offend, and paid costs, proceedings had been stayed; in others judgment had been recovered, and some were awaiting trial.

A number of cases of infringement of the Phamacy Act were reported to the Committee, and proceedings were recommended.

A memorandum from the chemists of Burnley on the subject of the proposed increase of duty on spirit was submitted. After consideration the Committee recommended that a reply be sent to the effect that the Council did not think it would be expedient that any official representation should be made to the government on the matter.

The following report of the sub-committee recently appointed to consider the method of conducting the examinations was considered, and the Committee recommended its adoption; the regulations to come into force in December next.

*Report of General Purposes Sub-Committee, consisting of the President and Vice-President, Messrs. Hills, Martin, Martindale, and Storrar.*

The sub-committee appointed to consider the method of conducting the Society's examinations and the conditions under which the Boards of Examiners are appointed, has had before it details of the arrangements under which other examining bodies perform their duties.

After full consideration, the sub-committee is unanimously of opinion that the present method of conducting the Society's examinations—other than the Preliminary—should be changed, and that provision should be made for the appointment of examiners who are engaged in teaching chemistry and botany.

It is considered desirable that no examiner should be deemed to be eligible for re-appointment for more than four consecutive years.

*The Sub-Committee makes the following recommendations*:—

1. The Boards of Examiners to include in future a certain number of teachers of chemistry and botany in universities, university colleges, or other public institutions approved by the Council, say two in chemistry and two in botany on the board for England and Wales, and one each in chemistry and botany on the board for Scotland.

2. The members of each Board to be appointed annually as at present, but no member who has been in office for four years consecutively to be eligible for re-election until after an interval of one year.

3. A certain number of the present members of the Boards of Examiners who have been examiners for more than four years to be ineligible for election according to seniority of service, say three of the board for England and Wales and two of the board for Scotland, each year. The order of seniority to be decided by lot where two or more examiners have served for the same period.

4. The Major examination to be conducted by the examiners engaged in teaching chemistry and botany, in association with one or two other examiners appointed by the boards.

5. The practical chemistry of the Minor examination to be conducted by the examiners engaged in teaching chemistry, in association with as many other examiners appointed by the boards as may be required.

6. The oral examination in chemistry and botany for the Minor examination to be conducted by the examiners engaged in teaching those subjects, in association with as many other examiners appointed by the Boards as may be required.

7. No change is considered necessary in the mode of conducting the examination in the other subjects of the syllabus.

With regard to the syllabus, it seems to the sub-committee that some such recommendations as the following ought to be added by the Council:—

> "Having regard to the large percentage of failures in the Minor examination, the Council considers it in the interests of candidates to point out that it is desirable before presenting themselves for examination that they shall have received a systematic course of instruction occupying a period of not less than six months.
>
> "This course should include at least 60 lectures in chemistry, 18 hours' work in each week at practical chemistry, 45 lectures and demonstrations in botany, and 25 lectures and demonstrations in materia medica."

The sub-committee is of opinion that the present system of remunerating members of the Boards of Examiners should be replaced by the capitation fee system generally adopted, viz., the payment to the boards of a fixed sum per head for each candidate attending for examination.

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The above report of the General Purposes Committee, with the exception of the legal portion having been read,

The President said the report of the sub-committee on the examinations had occupied the attention of six gentlemen for three or four months; they had held numerous meetings, had obtained the regulations of other examining bodies, such as the dentists, veterinary surgeons, and the various medical examinations, and had considered the subject from the point of view of the safety and confidence of the public and the satisfaction of the Privy Council. Two years ago a material change was made in mode of conducting the examinations, when the Major examination was made essentially written and practical without being necessarily oral. At the same time they put the Minor candidate through an examination in practical chemistry, dispensing, and pharmacy on a separate day, antecedent to the oral examination. The consequence was that there had been a great increase in the amount of chemical work in the Minor. They had been carrying on this work of qualification by means of the examining boards for something like forty years, and, like all bodies founded as they were, to whom statutory powers were afterwards given, they had gradually developed a system which had worked extremely well, which was carried on by their own members exclusively. But as time went on it was found in all such bodies that it was necessary to supplement the special knowledge possessed by their own members by that of those who were continuously engaged in teaching such subjects as chemistry and botany. These subjects were selected because a certain amount of elementary scientific knowledge of them was required, as defined in the syllabus, and it was considered that it would be a great advantage, and would be carrying out their duty with regard to the public, if recognised and qualified teachers of these subjects were added to the boards. It was suggested that one of each should be appointed in Edinburgh, and two each in London, and that they should work in association with the other members of the boards. The Committee believed that it was desirable that those examiners who were engaged in teaching should be part and parcel of the board, and not experts called in from outside to assist the board. It was anticipated that the association of such examiners with their own men would be beneficial to both. Something might be said for the suggestion that chemistry and botany should be taken out of the final stage of the examination and dealt with in another way by means of written papers, but that would involve a considerable extension of examinations, and would prevent what the Committee thought very important, the association of the individual members of the board with each other, so that they might consult each other and share the responsibility, which would conduce to make the board not only a strong one, but one in which their own members and public bodies outside would have every confidence. He took it there could not be any disadvantage to the pharmaceutical body as a whole in bringing outside men to assist in this work. The Apothecaries' Company for years carried on its examinations in a special way by its own members, and when the last Medical Act was passed, the views of many members of the House of Commons and those engaged in educational examinations were so strong about it that there was some danger of its power of giving a medical qualification being abolished. The Apothecaries' Company was, however, ultimately included as a qualifying body, and it then wisely set to work to associate with its own members in the examinations men, not necessarily members of the Company, who were engaged in teaching the subjects which formed part of the qualifying examination. The dentists and veterinary surgeons in a similar manner enlisted the services of teachers at their examinations, and they might fairly say the time had come when the Pharmaceutical Society should take the same step. In making this proposition, neither the sub-committee who drafted the scheme, nor the Committee who adopted it, had any other than praise to give to the members of the Boards of Examiners, who had worked for the Society for so many years. It was one of those conditions which must sooner or later be faced, and it was thought by the sub-committee the best time to face it was after they had had a little experience of the new method of examination, and when there would be plenty of room in Edinburgh for carrying on the examinations there as in London. It was believed that the association of their own brethren on the Boards of Examiners, with teaching colleagues of the kind he had mentioned, would produce an *esprit de corps* and leavening of the mass all round which would be good for everyone, and would probably lead to something like a definite curriculum. At any rate it would require an elementary systematic knowledge of botany, which would involve considerable expenditure of time and study, and those who had to examine into systematic knowledge should be to a great extent teachers. It was well known that those who were engaged in teaching young men were better able to judge of the relation of elementary knowledge of what was practicable, what was safe, and what it was reasonable to expect on the basis of the syllabus, than those who were quite removed from the sphere of teaching. The most difficult thing he had felt during the whole time he had been an examiner—and he had been connected with the board officially and unofficially for a great many years—was to put himself in the position of a student and to divest himself of the additional year which was continually coming upon him as he grew older, so as to be able to judge of a man's knowledge at the age of twenty-one or twenty-two in an equitable sense. These propositions were not submitted in any spirit of dissatisfaction with the work of the existing boards, but as the necessary concomitants of the additional powers placed in the hands of the Council by the Act of 1868. It was thought better for the Society to march a little in advance rather than be a little behind, for sooner or later attention would be called to the fact that in their examinations they were deficient in the element of teachers, which formed so important a part in every kind of qualifying examination with which he was acquainted. The other change suggested was that the examiners should not hold office continuously for more than a certain time. This rule was almost universal. It did not follow because a man was ineligible after four years that he should not be appointed again after an interval, but in all examination boards there was a regulation of this kind, and he was happy to think that amongst their rising pharmaceutical chemists there were some coming forward of whom they could make use, whilst at the same time there were many who had been on the board for years whose removal would be a very great loss to the Society. Still, the principle involved was a good one. It must be admitted at once that any appointments of this kind, which tended to engender the notion that it was an appointment for life, was bad. They had not been strong enough to inculcate this hitherto, but they had been gaining strength, and having extended the examinations, it was only right to introduce this further change. It was proposed that these changes should come into effect from the appointment of the next boards, and to get over the difficulties with regard to seniority it was suggested the names of retiring members should be taken by lot. There were a certain number who had been appointed some years, but until the system had got into working order it was obvious it would be necessary to adopt this system from time to time. Of course this regulation would refer to all examiners, whether those engaged in teaching or not; everyone would go out at the end of four years for at least one year. Inasmuch as a large part of the examination was technical, and would require the special services of pharmaceutical chemists, it was obvious that, having only a small number on the board engaged in teaching, it would be the duty of the Council to impose on that portion the greater part of the examination work in those subjects of chemistry and botany. They therefore recommended that the Major examination should be conducted substantially by those members, with the assistance in each case of as many more members of the board as were required; also that the oral examination in chemistry and botany should be conducted by them with as much assistance of the other members as might be necessary. This report, in fact, imposed those conditions on the future members of the Boards of Examiners, and left the work in the other portions of the syllabus untouched. Another point was the question of remuneration. In early days there was no remuneration, then there was a very modest one, and that had been increased of late years, but still was a modest fee for attendance. As the work was now very materially changed, it was thought that system would not work very satisfactorily, and the Committee recommended that the usual plan be adopted of paying a capitation fee on the candidates. The third suggestion was a recommendation which the Committee thought might with advantage be put in the syllabus. It was very painful to find many men coming up who had never had anyone who had given them the slightest notion of what amount of education was required before they could reasonably hope to pass, and as the Council always desired to foster education, he saw no harm in making a recommendation of this kind. Of course, they could not enforce it. Unfortunately they had not the power of insisting on the curriculum, but it was in the interest of students, their parents and guardians, that there should be a recommendation by the Council as to the safest way of acquiring sufficient knowledge to pass the examinations. He, therefore, proposed that the report and recommendations of the General Purposes Committee with reference to the conduct of the Society's examinations should be received and adopted. In doing so he would once more pay a personal tribute of admiration to the way in which the work had been done by his colleagues on the boards both in London and Edinburgh. He was sure that they, recognising the public character of the examination, and the fact that the Society was really a department of the State, would feel that such changes must be made from time to time as would render the certificates granted not only accepted by the public at large, but by all other licensing bodies, as being a guarantee that the recipients were in every respect qualified for the position they occupied.

Mr. GOSTLING said he only wished the recommendation said ten months instead of six.

The VICE-PRESIDENT, in seconding the motion, said the thanks of the Council were due to the President for the very lucid explanation he had given of these proposed changes, and he thought the less anyone attempted to add to it the better. It was a very important change, but was only suggested after months of reflection. The Society had to keep up with the times, and that might be said to be a sufficient explanation of the matter. At any rate, the explanation the President had given had been so full that he hoped everyone interested in the matter would read it carefully, when he believed they would see that the change proposed was fully justified.

Mr. SCHACHT said he should like to add one word, not so much in criticism of this scheme, but because he thought it desirable to give expression to the idea that this was only tentative and experimental. He hardly liked to look at it with his own ideas of examining boards as a perfect measure, but he was quite content to believe that it was very useful as far as it went. Amongst the many difficulties which attended examinations was that of giving every candidate absolutely equal chances of proving himself capable or incapable, and it occurred to him that with a board consisting of gentlemen with two sets of qualifications, and the candidate was not certain to which set he would be referred, it was just possible some men might think themselves unfairly treated. It occurred to him, therefore, that it would be a more perfect scheme if the purely scientific portions of the examination were relegated to the professional gentlemen, and the pharmaceutical portion retained in the hands and management of those who were really equally experts with their comrades in their particular sphere of knowledge. He should prefer, consequently, that all examinations in chemistry should be conducted by professional chemists, and botany the same, if possible, and also materia medica. He hoped this experiment was a step in that direction. He believed it was understood to be experimental rather than final, and he, therefore, approved of it completely as far as it went.

Mr. ATKINS thought it would be rather a pity if an important and organic change of this kind were passed by a silent vote. He was quite prepared to endorse the remarks of the Vice-President as to the lucid way in which the President put the case. He thought this scheme was really an illustration of the principle of evolution. It was just a development of what took place two years ago. At that time he felt that something of this kind must be the result of the step then taken, and he was entirely in accord with Mr. Schacht in regarding this matter as tentative. In this question there could be no finality. Time would show whether this worked beneficially, and he believed it would, for he believed the introduction of the experience of teachers into examinations was not only in accordance with general practice, but pre-eminently the right thing. He had been very glad to hear the President speak—with all his knowledge of the examiners—in the kind way which he did of those men. Of course those who had been very long upon the board and knew the works of the Society so well might feel a momentary sense of chagrin at having to obey this law of rotation, but, as the President had put it, it was from no sense of dissatisfaction with the present board that this change was introduced.

Mr. MARTIN said he agreed entirely with what was said by the Vice-President, and should not have thought it necessary to add one word if it had not been for the speeches of Mr. Schacht and Mr. Atkins. But having been a member of this sub-committee, and spent a great deal of time over it, he was rather sorry Mr. Schacht still thought it possible that the candidates would be examined by one set of men or by another set. It was not the purpose of this arrangement that that should take place, but that there should be the association of the teaching element—he preferred not to use the word "scientific," because he considered that practical men in daily contact with pharmacy might be as scientific as the teaching element, and indeed it was in the interest of the candidate that they associated the teaching element with that now existing, in order to prevent the ultra-scientific element of the advanced pharmacist having too much weight, and to have men on the board who were more in contact with the minds of the students. Rather than looking on this as anything like an experiment, he thought it was putting the examination on the true basis, and hoped there was a considerable element of permanency in it. He hoped neither the board, the candidates nor the public would look forward to the time when the examinations would be entirely in the hands of the teaching element, but that the practical element of pharmacy would always be associated with it. This was, in his opinion, an ideal condition of a board of examiners such as theirs. If they were examining in pure philosophy or science it would be a different thing altogether, but the object was to qualify men carry on a technical pursuit. They were trained by scientific men, and they were to be examined by men engaged in teaching, in association with those who were practising pharmacy. That was the idea of the sub-committee, and was embodied in the report.

Mr. STORRAR said he became a member of the sub-committee with the idea that no great change was required, but the result of the meetings and the information obtained led him to the definite conclusion that some such change as this was desirable. He was glad to hear the President and Mr. Atkins say that in no sense was this recommendation looked upon as a slur upon the present Boards of Examiners, and he hoped it would be accepted by the gentlemen composing those boards, in the spirit in which it was put forward, as an experiment which it was hoped would be successful for the benefit of the Society at large and the students. With regard to the limitation of time for which the examiners should hold office, he was strongly of opinion that this was the right course to take, and he might suggest that it might be extended a little further, possibly to members of the Council.

Mr. MARTINDALE said he held that an examiner should be like Cæsar's wife—above suspicion. They knew the high character of the Boards of Examiners, but it was a matter of evolution, and he held that a teacher made the best examiner in scientific subjects. He therefore cordially supported the proposition.

Mr. HILLS said he did not come to the sub-committee with the idea that little change was required, having been for some time of opinion that teachers should be associated with their own body in the conduct of the examinations, so that it was nothing new to him. To his mind they would get under these conditions almost an ideal examination, a wide knowledge of special subjects, together with that sympathy with the young and rising generation which was associated with teaching. He took it they would have those conditions fulfilled as regarded chemistry and botany, and also the other subjects in the syllabus, as they might have amongst the examiners men who were in the habit of teaching their apprentices or junior assistants, and so keeping themselves constantly in sympathy with young men. He had much pleasure in supporting the proposition.

Mr. HAMPSON said he looked at the matter as one outside the sub-commiteee, and not biassed in any way, but after a very careful perusal of the document he came to the conclusion that he could not suggest any change whatever, as it seemed to deal with the subject so thoroughly. For a number of years there had been an indication of the necessity for a change, and this had now ripened into the presentation of this document. He was quite sure that for a considerable time at least these changes would operate satisfactorily, and in the direction contemplated by the Committee, and that it would be some time before any further change would be necessary. Of course it was not possible to say the change would not come, but for a considerable time he felt persuaded that nothing would be required.

Mr. JOHNSTON heartily agreed with the report. He considered the teachers were the proper persons for examiners, with the addition of the present examiners, and that the students would be better satisfied with the addition of teachers. He was not quite sure whether the plan of going out in rotation would work very well, as probably in the course of three or four years they would have the same boards again. That was the case with commercial boards, where the members had to retire after three or four years; they were off for a year, and then were re-elected, but, on the whole, no doubt the change would do good. The suggestion that the students or apprentices should spend six months in scientific instruction would operate very well in London and other large cities, but in country districts, especially in Scotland, he thought it would be hardly possible for many young men to be able to devote six months for the purpose of obtaining this knowledge. Very often their parents were not in a position to send them away for six months, and they had to pick up their knowledge whilst they were assistants. On the whole, however, he thought the report was a very good one, and hoped it would be adopted.

The PRESIDENT said the recommendation to which Mr. Johnston had referred was based on the supposition that a man was going to devote a certain portion of his time to study, but it also meant this; they wanted young men to know that in the course of some time during the three or four years in which they were preparing for the examination, they must obtain systematic instruction equivalent to this if they hoped to pass. It was not a hard and fast line; it was not necessary for them to take the whole in six months, but it practically meant that to obtain systematic knowledge of this sort, if done all at once, would take at least six months, but if they were going to take it in parts spread over two or three years, there was no particular reason why they should not. The point was that the definite amount of practical training specified was really required. It was difficult to lay down any general conditions, but there was no doubt a tendency to do a large quantity of final work at some school or institution, and the current idea was that two or three months would do. They knew quite well that it would not do. Of course, some men were so gifted and had had so much previous training that when they went to an institution for a short time they were quite ready to pass the examination, but the average man who had been working during the greater part of his apprenticeship, and who went to an institution expecting to obtain the knowledge necessary for his Minor in three months, was simply deceiving himself and throwing his money away. It was with a view to advising these young men that the recommendation was put in.

The resolution to adopt that portion of the General Purposes Committee report that dealt with the method of conducting the Society's examinations was then put and carried.

Mr. STORRAR suggested that it would be well to remit the matter of appointing the new examiners to some committee for consideration, some time before the appointments were made.

The PRESIDENT said this matter would probably be brought forward about October. It might be desirable to have a permanent examination committee.

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The Council then went into committee to consider the legal portion of the report of the General Purposes Committee.

On resuming, the report and recommendations were adopted, and a special resolution was passed authorising the Registrar to take proceedings against the persons named.

### INTERNATIONAL CONGRESS OF HYGIENE.

The PRESIDENT reminded the Council that some months ago he read an invitation from the President and Secretary of the International Congress of Hygiene and Demography, which was to meet at Buda-Pesth in September next. If any of the members of the Council would be able to attend it would be as well that they should be appointed delegates. He might add that there were several excellent pharmacists there, one of whom had written a letter saying that every effort would be made to make English visitors comfortable.

The President and Messrs. Greenish and Martindale were appointed delegates.

# Scottish Transactions.

## EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The first botanical excursion of the season took place on the evening of Wednesday, May 23, to Craigleith Quarry. Owing, perhaps, to the following day being a general holiday, there was a small attendance. A large number of plants were gathered, *Sherardia arvensis* being the only one not found on previous visits to the same place. Most of the specimens were only partially in flower, and it was evident that another visit a few weeks later would be amply rewarded. It was noted that hawthorn and similar trees showed an exceptionally rich profusion of flowers. The young foliage in many cases was considerably damaged by frost. The excursion was conducted by Mr. W. B. Cowie.

## EDINBURGH PHARMACY ATHLETIC CLUB.

The annual sports took place at Powderhall Grounds on Wednesday, May 30, in presence of about 1500 spectators, and in fine weather. In the confined races the principal prize takers were as follows:—One Mile Bicycle Race, 1st, A. P. de St. Claire; 2nd, D. Hutchison. Putting the Ball, G. F. Anderson. Half-Mile Flat Race, 1st, A. G. Paterson; 2nd, G. Somerville. Apprentices' Race, 1st, J. Hogg; 2nd, W. B. Hendry. 200 Yards Flat Race, 1st, G. Somerville; 2nd, J. Brown. The Five-a-Side Football Match was won by Duncan, Flockhart and Co. (West-end). The judges were Messrs. Duncan, Fraser, and Coull; handicapping committee, Messrs. Birnie, Gibb, and Jameson. Much credit was due to the Secretary, Mr. J. P. Gibb, for the success of the whole of the proceedings. Mr. D. McLaren presided at the presentation of prizes by Miss Pagan.

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### SCOTCH APPEAL CASE.

In the High Court of Justiciary, Edinburgh, on Friday, June 1, judgment was delivered in the appeal case, Tomlinson *v.* Bremridge, which was heard before the Lord Justice-General, Lord Justice-Clerk, and Lords Adam, Kyllachy, Kincairney, and Stormonth-Darling on Monday, March 19 (see pp. 802 and 821).

The original case was heard on November 23, in the Summary Court of Lanarkshire, at Glasgow, before Sheriff Birnie (see p. 447), and the following is the narrative of complaint prepared by the Sheriff:—

*Narrative of Complaint.*

This is a case brought under the forms of the Summary Jurisdiction (Scotland) Acts, 1864 and 1881, at the instance of Richard Bremridge, number Seventeen Bloomsbury Square, London, W.C., Registrar under "the Pharmacy Acts, 1852 and 1868," in name and by the authority of the Council of the Pharmaceutical Society of Great Britain, with the concurrence of James Neil Hart, Procurator Fiscal, of Lanarkshire, at Glasgow, against William Tomlinson, number One hundred and thirty-three West Scotland Street, Glasgow, and sets forth that the said William Tomlinson has been guilty of an offence within the meaning of the first and fifteenth sections of "The Pharmacy Act, Eighteen hundred and sixty-eight," in so far as on or about the twenty-eighth day of July, Eighteen hundred and ninety-three, the said William Tomlinson not being a duly registered pharmaceutical chemist or a chemist and druggist, within the meaning of the said recited Act, and within the premises, number One hundred and thirty-three, West Scotland Street, Glasgow, then occupied by Dr. Hugh Kelly, or by some other person or persons to the prosecutor unknown, unlawfully, and contrary to the first and fifteenth sections of the said recited Act, did sell to Joseph Is[illegible], residing at number Twenty-one Oxford Street, Edinburgh, a poison within the meaning of the said recited Act, to wit, a quantity of oxalic acid, whereby the said William Tomlinson has become liable in a penalty of five pounds sterling.

And likewise the said William Tomlinson has been guilty of an offence within the meaning of the first and fifteenth sections of "The Pharmacy Act, Eighteen hundred and sixty-eight," in so far as on or about the twenty-ninth day of July, Eighteen hundred and ninety-three, the said William Tomlinson, not being a duly registered pharmaceutical chemist, or a chemist and druggist, within the meaning of the said recited Act, and within the premises number One hundred and thirty-three West Scotland Street, Glasgow, then occupied by Dr. Hugh Kelly, or by some other person or persons to the prosecutor unknown, unlawfully and contrary to the first and fifteenth sections of the said recited Act, did sell to John Rutherford Hill, Thirty-six York Place, Edinburgh, a quantity of prussic acid, a quantity of opium, and a quantity of chloroform, all being poisons within the meaning of the said recited Act, said poisons when sold by the said William Tomlinson, as aforesaid, formed part of the ingredients of a mixture compounded or dispensed by the said William Tomlinson from the following prescription:—

" ℞ Sod. bicarb. ........................................ʒij.
Bism. subnit.........................................ʒij.
Hydrocyan. ........................................♏. xxx.
Tinct. opii .........................................ʒij.
Sp. chloroformi.....................................ʒij.
Aq. ad...............................................℥vi.
F.M. Sig. ℥ss. every 4 hours."

Whereby the said William Tomlinson became liable in a penalty of five pounds sterling, and said complaint craves the court to grant warrant to cite the said William Tomlinson to appear to said complaint and thereafter to convict him of the respective offences foresaid, and to adjudge him to suffer the respective penalties provided by the said recited Act, and to decern against him for the expenses of the prosecution.

*Facts.*

The following facts were admitted or proved.

1st. The whole averments of fact contained in the complaint.

2nd. That the shop, One hundred and thirty-three West Scotland Street, where the poisons in question were dispensed, belongs to Dr. Hugh Kelly, who is a properly qualified and registered medical practitioner, and also a properly qualified and registered chemist and druggist.

3rd. That the appellant is not a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the said Acts.

That on the two occasions libelled, Dr. Kelly was not present when the poisons were sold, and the business was being conducted in his absence by the appellant.

It was before the passing of the Pharmacy Act, 1868, and still is, quite a common thing in Scotland for medical practitioners to keep drug [illegible]

*Conviction.*

I convicted the appellant of both offences, and imposed a modified penalty of £1 1*s.* for each offence, with the sum of £2 2*s.* of expenses.

The appellant thereupon demanded a case to be stated for the opinion of the Court of Appeal, and he complied with the statutory requirements relative thereto.

### *Questions of Law.*

The questions of law for the Court of Appeal are:—

1st. Whether in the shop of a duly qualified and registered medical practitioner, his assistant, who is not a duly qualified and registered medical practitioner, nor a registered pharmaceutical chemist or chemist and druggist within the meaning of the said Acts, contravenes the 1st and 15th sections of the Act of 1868 if, in the absence of the medical practitioner, he sells any of the poisons included in the schedule annexed to the Act?

2nd. In the event of the first question being answered in the affirmative, whether the employer or his assistant is liable in the penalty?

3rd. Whether in the whole circumstances of the case the conviction in question was justifiable?

This case stated by me and delivered on the 16th day of February, 1894.

(Signed) J. B. L. Birnie.

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The decision of the High Court of Justiciary was as follows:—

### *Judgment of the High Court.*

The Lord Justice-Clerk: The conviction which forms the subject of this appeal was pronounced on a complaint which charged the appellant with an offence against section 1 and 15 of the Pharmacy Act of 1868, in respect that he, not being a person qualified according to the requirements of that Act, sold certain poisons and substances to a person named contrary to that Act, and thereby was liable in the penalty prescribed by it. The first clause makes it unlawful for a person not qualified in the manner set forth to do certain things, and the 15th clause fixes a penalty for the doing of any of these or certain other things. The words in both clauses which require to be considered are the words, "Any person who shall sell or keep open shop for retailing, dispensing, or compounding poisons," and the question which arises is whether, if it be proved that an individual who is not qualified has *de facto* sold poison, that is sufficient to justify his conviction under sec. 1, and his being sentenced to pay a penalty under sec. 15. The facts are that the appellant's master is a properly qualified medical practitioner, who is under a later Statute declared to be a competent person to sell poisonous drugs, as if he possessed the qualification set forth in the Act of 1868, and that the appellant, not being himself qualified, sold poison in his master's absence. The chief argument of the appellant was that although in point of fact he performed the sale, he did not truly sell, that the sale was the sale of his master, who alone had any interest in the transaction, that the Statute was not intended to strike against the subordinate, who acted only as a servant, but only against the seller in the sense of the trader, in whose interest and to whose profit the sale was made. My Lords, when I read the clauses founded on I find no ground for holding that they do not strike at the person who performs the act of sale. The word "sell" appears to me to be used applying to the person doing the act of sale in a retail business, whoever may be the person or persons for whose behoof he acts. The words "or keep open shop for the retailing, dispensing, or compounding," set forth an offence by itself, for which the penalty of the act might be inflicted without proof of an actual sale. But that the word "sell" is intended to strike at the person who does the act of selling, I have no doubt. I think that the word must be taken in connection with the statement of non-qualification as applicable to the person who does the act. If it did not, the purpose of the Act, which is declared to be the safety of the public, would be defeated. The purpose is to ensure the public safety in the sale of poisons, and that cannot, as I think, refer to sale in any other sense than the external transaction of giving over, as the person carrying out the sale, to a purchaser the article he demands in the ordinary course of retail business. The meaning of the Act is, in my opinion, that poison shall not reach the hands of members of the public by the transfer of sale, except through the medium of a person possessing a satisfactory qualification, and that any person not possessing that qualification who effects such a sale by giving poison by sale to a member of the public desiring to purchase it, offends against the Statute. Reference was made in the debate to the preamble of the Statute, in which the word "sell" does not occur, and it was therefore maintained that the word "sell" in the enacting clauses should be read so as not to go beyond the preamble. I do not think that such a course can be justified. If the enacting words of a Statute are in themselves distinct, I cannot hold that their going beyond the preamble is a reason for setting them aside or endeavouring so to read them as to take away their meaning, particularly if in doing so the main purpose of the Act, as expressed in the same preamble, would thereby be practically defeated. That it would be so here there can be no doubt, for if the appellant's contention be sound, then if a person qualified under the Act opens a shop, poisons may be daily sold in that shop by persons having no qualification, and no prosecution can be successful, for the shop is not opened and kept by an unqualified person, and it is the qualified person who, by the hand of the unqualified assistant, sells to the public. And as a doctor, as in this case, is qualified, he may spend his whole day in visiting his patients while poisons are hourly dispensed on his premises by an unqualified shop-boy, yet no penalty can be inflicted, and therefore no deterrent put in force against such dangerous practice, which it was the very purpose of the Statute to prevent. It is noteworthy that where, in another clause of the Act, it was deemed desirable to make the act done by the servant to be the act of the employer, this was expressly set forth. For in sec. 17 it is declared that "for the purposes of this section the person on whose behalf the sale is made by an apprentice or servant shall be deemed to be the seller," thus distinguishing sales under that section from those made under the sections in question. My Lords, I am confirmed in the views I have expressed by the decision in England upon this same question in the case of Wheeldon, and also by what fell from the noble lords who sat on the appeal case of the London and Provincial Supply Association, and I have, therefore, come to the conclusion that the first question stated in the case should be answered in the affirmative. As regards the second question, it is only necessary to say that the sentence to pay the penalty can only be imposed upon the person convicted. The third question is merely formal, and, if I am right as regards the first, must be answered in the affirmative.

Lord Adam: The appellant, Tomlinson, was not, at the date of the conviction in question, a person duly qualified to sell, or to keep open shop for retailing, dispensing, or compounding poisons, under the Pharmacy Act, 1868. He was, at the time, an assistant, or a servant, in the shop of a Dr. Kelly, who was a duly qualified person under the Act. On the two occasions libelled, the appellant there, in the absence of Dr. Kelly, sold poison to customers. For so doing he was convicted of a contravention of the 1st and 15th sections of the Act. The question is whether the conviction is right. The first section provides that it shall be unlawful for any person to sell poisons, unless such person shall have one or other of the qualifications therein specified; and the 15th section provides that any person who shall sell poison not being a person duly qualified under the Act, or shall do certain things, or shall fail to do certain other things there enumerated, shall for any such offence be liable in a penalty of £5. Now it is not disputed that the appellant did, in fact, sell poison, and that he was not a person duly qualified to sell in terms of the Act. *Primâ facie*, therefore, it appears to me that he was guilty of the offence of which he has been convicted. But it was maintained that he was not the "seller" of the poison in the sense of the Act; that the "person" referred to and struck at by the Act was, not the shopman or assistant, who might have merely handed the poison over the counter, but the owner of the shop or business, being the person on whose behalf the sale was made. I cannot adopt that view. It appears to me that the prohibition to sell is of universal application, and applies to all persons, excepting only those persons who are duly qualified to sell poisons in terms of the Act. That the "person" referred to in sections 1 and 15 is not the person only on whose behalf the contract or sale is made, appears to me to be clear from the terms of section 17. That section declares that it shall be unlawful to sell poison, unless certain regulations therein specified are observed, and that any person selling poison otherwise than is therein provided shall be liable to a penalty, and that "for the purposes of this section the person on whose behalf any sale is made by any apprentice or servant shall be deemed to be the seller." The inference appears to me to be irresistible, that in the other sections of the Act the master of the apprentice or servant who, in fact, makes the sale of the poison is not to be deemed the seller, and if he is not to be deemed the seller there is no other person to whom the Act can possibly apply except the assistant, servant, or apprentice who actually makes the sale. For these reasons I am of opinion that the appellant was properly convicted. The present question was in terms decided in England in the case of the Pharmaceutical Society *v.* Wheeldon, 24 Q. B. D. 683, in the same way in which I propose to decide this case, and the same view of the Statute was expressed by Lords Selborne and Blackburn in the case of the Pharmaceutical Society *v.* Provincial Supply Association, 5 Ap. Cas. 807. These are not perhaps authorities by which we are technically bound, but I concur in and adopt the reasoning in these cases, and I may say, seeing that this is a question of the construction of a British Statute, that if I had doubted as to the proper construction of the Act, I should without hesitation have yielded to the authority of these eminent judges.

Lord Kyllachy: I regret that I am not able to concur in your lordships' judgment. I have, I confess, great difficulty in reading this Statute as requiring more than that the seller of these poisons—that is to say, the shopkeeper, the trader, the seller in the ordinary and legal sense, as distinguished from the mere salesman, shall possess the requisite qualification. Nor indeed have I been able to see how, if the head of the establishment, the person responsible for its conduct, is duly qualified, it adds anything to the public security that the mere salesman, who makes the sale, but may have nothing to do with the compounding of the drug, shall be also qualified. At the same time I am not sorry that the majority of your lordships see your way to a different conclusion. It would certainly be inconvenient that this Statute should be differently construed in Scotland and in England, and that would, it appears, be the result if your lordships took the view of the Statute to which my judgment inclines.

Lord Kincairney: I concur in the opinion of the Lord Justice-Clerk and Lord Adam that the appeal should be refused, but I cannot say that I adopt that opinion without considerable hesitation. I ha found the Pharmacy Act, 1868, exceedingly diffic to construe. Of course, its main object is to sec the safety of the public; but the doubtful point i whether the scheme of the Act is to attain th object by endeavouring to secure that those wh carry on the business of selling poisonous drugs i chemists' and druggists' shops shall be men of respectability and of adequate scientific knowledge, o by endeavouring to secure that their assistants al who may sell poisons on their account shall b equally qualified and instructed; the whole difficult apparently arising from the ambiguity or possib ambiguity of the words sale and seller. The latt view has been adopted in England, and has bee supported in elaborate judgements by Baron Polloc and Justice Hawkins in the case of Wheeldon, an in a very important judgment by Lord Selborne— concurred in on that point by Lord Blackburn— delivered in the House of Lords in the case o The London and Provincial Supply Association a case followed in our courts in Bremridge v Gray, July 20, 1887, 14 R. (Justiciary) 1 These are very important judicial opinions o the construction of a British Statute unskilfully and obscurely expressed; and while I do not adopt everything that is said in them, their reasoning seems t me of great weight and force, and not having been able to form a very confident opinion as to the true construction of the Statute, I think myself entitled to defer to such weighty authority.

Lord Stormonth-Darling: My view of the Statute is the same as Lord Kyllachy's, but there is no question of principle involved, and I have no desire to detain the court by stating my reasons at length, especially as I am conscious of some advantages in having the Statute interpreted as the majority of your lordships propose to do.

The Lord Justice-General: The judgment of the court will be: Refuse the appeal. My own opinion coincides with the opinions of the Lord Justice-Clerk and Lord Adam.

Mr. Morison: I move, your lordships, for expenses.

Mr. Guthrie: This was a test case brought in reality by an association who had a very great interest in the question. I therefore submit no expenses should be awarded against the appellant.

The Lord Justice-General (after consultation with the other judges): With expenses.

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### INTERLOCUTOR IN APPEAL.

*Tomlinson* v. *Bremridge.*

Act Guthrie and Ure. Alt. Salvesen *et* T. B. Morison, Edinburgh, June 1, 1894.

The Lord Justice-General, Lord Justice-Clerk, and Lords Commissioners of Justiciary having considered this appeal and heard counsel for the parties, answer the first question in the case in the affirmative;

Find, in answer to the second question, that the person convicted is the person liable in the penalty;

Answer the third question in the affirmative.

Dismiss the appeal and decern, find the respondent entitled to expenses, allow an account thereof to be given in, and remit the same when lodged to the clerk of court to tax and to report.

(Signed) J. P. B. ROBERTSON, I.P.D.

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### POLICE PROSECUTION UNDER SEVENTEENTH SECTION.

Alfred James,* Netherfield, described as a chemist, was charged with selling poison without putting a label on the bottle containing it. The charge arose out of a recent se of inadvertently administering a dose of laudanum a child at Carlton, instead of a mixture of syrup of ubarb and laudanum (see *ante*, p. 1022). Mr. H. B. ayton defended. William D. Wykes deposed to having rchased at the defendant's shop one pennyworth of udanum. The defendant served him, but did not t a label on the bottle indicating that it was poison. cross-examination, he said he had previously pur- ased at his shop laudanum mixed with syrup of ubarb, the bottle being labelled to that effect, d with the word "poison." Some time ago he st two children, twins, but they did not die of an erdose of laudanum; they died natural deaths.—rs. Wykes said she gave the laudanum to the child der the impression that it was a mixture. The udanum had been purchased for her toothache.—rgeant Goddard said the defendant made a state- ent before the coroner at the inquest on the child at he had no recollection of serving the laudanum. -Mr. Clayton submitted that only a technical offence d been committed. The label used was an old one, ith an address when he was in business at Bow. hen the laudanum was sold another label was sted over it. The second label had probably been bbed off.—Mr. Wild said it was a dangerous method doing business. The old label ought to have been ken off or obliterated with a pen. The defendant as fined 20s., and was desired to be more cautious in ture.—*Nottingham Evening Post.*

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* No person with this name and address is on the Register of Chemists and Druggists for 1894.

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### Prosecutions under Section Seventeen at Oldham.

At the Oldham police court on Thursday, the atent Medicine Vendors' Defence Association, imited, by the hon. sec. and treasurer, Mr. J. Leg- ett, 95, Boaler Street, Liverpool, summoned several cal firms for breaches of the Pharmacy Act. Mr. eo. Braddock, chemist, of 1, Market Place, appeared answer to six summonses. One was for selling a reparation of strychnine known as "Fellows' Syrup Hypophosphites" to an unknown person; another as for not entering the sale in a book kept for that urpose; another was for not having the bottle containing the poison labelled with the seller's name and ddress; and the other three were in the same terms specting a sale of one dozen fly-papers containing rsenic. There were six similar summonses against he proprietor of the Whittingham Drug Stores, anchester Street. Messrs. Braddock and Bag- awe, chemists, Yorkshire Street, were summoned two instances, the one for selling Fellows' Syrup Hypophosphites to an unknown person, and the her for not entering the sale. Messrs. Thorpe d Co., Paradox Pharmacy, Yorkshire Street, and r. Granville Wood, chemist, High Street, were ch summoned in three instances for selling the rup to an unknown person, not entering the sale, d not labelling the bottle.

Mr. S. Smith prosecuted, and Mr. Fripp defended.

The cases against James Whittingham,* patent edicine vendor, were taken first, Mr. Fripp pro- sting that the prosecution was a vindictive and iteful one. Evidence was given of the purchase of ellows' syrup and fly-papers from the defendant, but e magistrates held that fly-papers did not come ithin the meaning of the Act. Mr. Fripp further ntended that proceedings under the Act ought to be alt with by the Pharmaceutical Society, and the agistrates were now asked to sit in judgment on at body. He submitted that Fellows' syrup was not poison within the meaning or the Act. It was a eparation of hypophosphite of lime containing rychnine, and was not pure strychnine.

The magistrates, having already decided against the prosecution in regard to the fly-papers, reserved their decision regarding the sale of Fellows' syrup, and adjourned all the other cases for a week to enable their clerk to look up the existing decisions on the subject.

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### Sale of Poison by Unregistered Person.

On Wednesday, June 6, at the County Court, Hyde, Cheshire, before his Honour Judge Hughes, the Pharmaceutical Society of Great Britain sued William Maxwell, of 24, Market Street, Broadbottom, Lancs, for two penalties for keeping open shop for the sale of poison, to wit, oxalic acid, on March 28 and April 7, 1894, and one penalty for the use of the title chemist.

On the case being called, it appeared that defendant had paid the amount into court on the previous day, but too late for notification to be sent to stop the attendance of plaintiffs' counsel and witnesses. Mr. T. R. Grey, who appeared for the plaintiffs, therefore applied for the costs of the action, which application his Honour granted.

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## PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

### Alleged Deficient Spirit of Nitre.

On May 30, James Upperdine, shopkeeper, Mapplewell, was charged before Mr. C. Harvey and Captain Ormsby, at Barnsley, with having sold sweet spirit of nitre adulterated with 5 per cent. of water.—Mr. Bundy appeared to prosecute under the Food and Drugs Act, and explained that he had a letter from Mr. Rideal, who appeared for defendant, saying that he had relied on a written warranty of the purity of the article supplied to the defendant. If he was able to prove such warranty he should withdraw, as he would have no authority to proceed. On Thursday, May 17, he visited defendant's shop and purchased three ounces of sweet spirit of nitre and divided the sample in the usual way. The analysis showed a dilution of the spirit of nitre of the lowest specific gravity ·850 with 5 per cent. water. The sample was almost destitute of real nitrous ether, the element of value in the spirit, this being probably due to the adulteration of water, as this had the effect of bringing about a deterioration of sweet spirit of nitre by keeping.—Mr. Rideal said the spirit was purchased from Messrs. Smith, Dixon, and Lodge, wholesale druggists, of Leeds, on September 22, 1892, and on the bottle was a large label, with the words "warranted genuine." Defendant on being served with a summons went to the firm from which the article was purchased, and a representative was in court that day. A sample of the nitre was tested, and it was found that there had been no adulteration, but it was believed to have lost strength by evaporation.—Mr. Bundy submitted that a private label was not a written warranty. —Mr. Harvey pointed out that the shopkeeper was not an analyst, and he did not see how they could do anything with him in the face of a label of assurance like that. The case was dismissed.—*Sheffield and Rotherham Independent.*

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### Compound Liquorice Powder.

At Saddleworth police court, on May 23, Sarah Pickup, general dealer, Greenfield, was summoned for selling compound liquorice powder destitute of sulphur. The charge having been proved, the magistrates imposed a fine of five shillings, including costs.

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* This name does not appear on the Register of Che- ists and Druggists for 1894.

## POISONING CASES AND INQUESTS.

### Suicide by Laudanum Poisoning.

On Thursday, May 31, Dr. George Danford Thomas held an inquest respecting the death of Catherine Augusta Buchell, aged 51 years, wife of a wood carver, residing at 124, St. Paul's Road, Camden Town, who committed suicide by poisoning herself. The evidence showed that the deceased had for some years past been in a very low and desponding state of mind, and on Monday evening she was found lying on the bed in an insensible condition, whilst in a cupboard close by was a bottle labelled laudanum. Dr. Fountain, of 225, Camden Road, was called to see her, and found that she was suffering from the effects of laudanum poisoning. The son, on going into another room, found three other bottles, each of which were labelled laudanum. Each bottle had a different label on it, showing that the laudanum had been purchased at four different chemists in the neighbourhood. Although everything was done for her, she sank and died about six o'clock the following morning, death being due to laudanum poisoning. One of the bottles was labelled the North-West Drug Stores, High Street, Camden Town, and the jurymen wished to know whether this was the proper address of the seller of the poison; on which the coroner said that he did not think it was. Under the Pharmacy Act it was the person selling laudanum, which came under the second schedule of the Act, who was supposed to label the bottle with the name and address of the seller and the name of the poison. As to the question whether the name of the North-West Drug Stores was sufficient, he certainly thought that it was not sufficient, for it certainly was not the name of the seller. A juryman said that he thought that such was not in compliance with the Act. A verdict was returned of "Suicide whilst of unsound mind."—*North-Western Gazette.*

### Poisoning by Laudanum.

On Sunday, May 20, a blacksmith's striker, named David McCallum, aged 45 years, of 15, Hope Street, Barrow, died as the result of drinking some beer, in which he appears to have put a quantity of laudanum.

At the coroner's inquiry, held before Mr. Coroner Poole and a jury, Dr. Fell said he was called to see deceased on Sunday morning, and was told he had taken laudanum. He applied the stomach pump, and found the stomach contained laudanum and the remains of some old beer. Witness had last attended deceased six weeks ago for an abscess on the knee. Deceased was not healthy, principally through drinking. He had no doubt that death was caused by laudanum poison. The bottle produced would hold sufficient to kill him if he had not been in the habit of taking it regularly.

Ernest Arthur Rowbottom said he was a chemist, residing in Rawlinson Street. The bottle produced had his label on, but it did not appear to be a new label. He should think the bottle had contained several supplies of the poison. He had been to see deceased, but did not recognise him. He could not remember having served deceased with the laudanum. It was a ½-oz. bottle, and would hold two-pennyworth of laudanum. He could not remember ever serving deceased with laudanum, and thought he did not go for it himself. There were no restrictions on the sale of laudanum, so long as it was labelled.

The coroner briefly reviewed the evidence, which he said pointed to the conclusion that deceased carried out a threat which he made about a week before. As to the state of mind of a man who put poison into something else to make it more agreeable, that was for the jury to decide, but he thought he was not insane. However, there was nothing in the way of burial laws now against a man who committed su in any state of mind, and the point was not impor A number of cases of laudanum poisoning had before him, all of which had been reported to proper authorities, but no step had yet been take restrict the sale of it.

A juror said they had no evidence before them as whether the poison was administered by the deceas to himself or by somebody else.

The coroner: You have the statement that he sa he would take it to destroy himself.

Eventually a verdict was returned that deceas died from laudanum poisoning, but there was no evidence to show his state of mind at the time, and recommended that steps should be taken to place some restrictions upon the sale of laudanum as a narcotic poison.—*Barrow Herald.*

## PROCEEDINGS UNDER THE MEDICINE STAMP ACTS.

### Liability of Medicines to Stamp Duty.

In the High Court of Justice, Queen's Bench Division, on May 30, the appeal case—Smith *v.* Mason and Co.—was argued before Mr. Justice Cave and Mr. Justice Collins. This was a case as to the liability of patent or homœopathic medicines to stamp duties. It arose upon an information of Hartley Smith, one of the officers of Inland Revenue, against "Mason and Co. (Limited)," of South Shields, for vending a packet containing a medicine or medicament for the cure or relief of disorders, and subject to stamp duty, chargeable under the statutes—that is to say, Dr. Gregory's stomachic powder—without a paper cover and label duly stamped, in respect of which the information claimed a penalty of £10. And there was a second information in similar terms, except that it had reference to a medicine called tincture of nux vomica. The informations were dismissed by the magistrates, who, however, stated a case for the court, and it was stated by counsel that it involved a question of a considerable sum to the Revenue. The stamp duties payable in respect of medicines are charged by the Stamp Act of 1804 and the Medicine Stamp Act, 1812, and the question was as to the exemption in the latter Act. It was proved that the company distributed a book containing a list of the medicines they sold; and that the purchaser of the medicines now in question had previously received a copy of this book, and that the company had sold for 6*d.* a bottle of Gregory's stomachic powder, and a bottle of tincture of nux vomica, without any stamp being affixed to either. There was no doubt that these would come within the enactment as to duty, but there were special exemptions of "all medicinal drugs sold by qualified chemists, etc., entire, without any mixture or composition with any other drug or ingredient," which, it was said, applied to and exempted the homœopathic medicine; and there was also an exemption of mixtures, compositions, or preparations sold by chemists, and not by any paper labels or advertisements recommended by the owners to the public as nostrums or proprietary medicines, or as specifics, or as beneficial for the prevention, cure, or relief of any disorder, malady, ailment, or complaint. The magistrates thought both the medicines in question came within these exemptions. This the Commissioner of Revenue disputed.

Mr. Danckwerts argued on their behalf in support of their contention that the medicines were not exempted. As to Dr. Gregory's stomachic powder, he urged that the word stomachic made it a specific, besides which there was the book, and so the exemption did not apply. And so as to the tincture of nux vomica, he relied upon the book and also a handbill n which the bottle was wrapped, and containing the words "Nux vomica—derangements of the stomach, pasms, etc." It was proved that Dr. Gregory's powder is the preparation well known and sold as Gregory's stomachic powder, and that the homœopathic tincture of nux vomica is the same as that in the British Pharmacopœia, except that the homœopathic tincture is much weaker. Moreover, the exemption only applies in favour of persons regularly educated as apothecaries or druggists, and the company did not appear to have any persons so educated in their service.—Mr. Justice Cave: Then if I go into a chemist's shop and get a bottle of Gregory's powder, without any description of it on a label or handbill, there is no penalty incurred?—No. But in this case the exemptions do not apply.

Mr. T. W. Chitty appeared for the defendants, the company, and argued that there was no label holding out the powder as a specific or remedy for any disease, but only describing its nature. As to the book, it must be fixed to or attached to the medicine, or at least handed with it, and as to any notice or advertisement, it must be issued by the makers or owners or first vendors; and the defendants are not the owners or makers or first vendors.—Mr. Justice Cave: Surely they are makers or vendors?—Not makers; they do not manufacture the powder, they purchase it from wholesale manufacturers; and they are not "first" or original vendors. Moreover, they are not chemists or druggists; they are a company. They may have properly educated assistants.—Mr. Justice Cave: It does not appear that they have any; and only such assistants can sell the medicines to be exempted.—It is stated that the homœopathic medicines are "prepared by duly qualified chemists."—Mr. Justice Cave: Not your clients' assistants; they do not prepare the medicines, but they sell them, and there is no exemption of persons not duly qualified who sell such medicines.—Gregory's powder is in the British Pharmacopœia as an old medicine, not a patent medicine, and well known before the Act. It does not come within the enactment at all. The context shows that the enactment only applies to nostrums or quack medicines or specifics, not to articles in the Pharmacopœia. Then the tincture is exempt as a simple drug in the Pharmacopœia, just like carbonate of soda; it is not a mixture or preparation.—Mr. Justice Cave: There is still the point that the company are not duly qualified chemists, as to which no evidence was given.—The question as to homœopathic medicines is important, as a decision will have a very wide application.—Mr. Justice Cave: It will not interfere with the sale of homœopathic medicines unless advertised as cures for particular disorders. There is the label.—It is not a public notice affixed to the bottle.—Mr. Justice Collins: Was not the onus upon the defendants of proving a sale by duly qualified chemists?—Yes.—Mr. Justice Collins: But they did not give any such proof.—The advertisement would not affect the tincture, as it is a simple drug.

The Court came to the conclusion that the magistrates ought not to have refused to convict, and that the case should be sent back to them.

Mr. Justice Cave, in giving judgment, said the magistrates were wrong as to both medicines. As to Dr. Gregory's powder, the Act applied to medicines by public notice held out as cures for any complaint; and the powder was so held out as "a stomachic." It was urged that the notice should be affixed to the bottle; but the book contained a description of the powder as a remedy for acidity, impaired digestion, etc. In a newspaper that would be an advertisement or notice, and it was not the less so because in a price list distributed gratis. There was a public "notice or advertisement" which brought the case within the enactment. Further, as to the exemption, it only applied in favour of persons who were duly qualified, and the defendants did not, therefore, bring themselves within the exemption. Then, as to the tincture, the same observations applied. Tinctures were expressly mentioned in the Act, and there was a description of it affixed to or delivered with the bottle. It was said it was exempt as a pure drug, not mixed or compounded with anything else; but it was mixed with spirit, and, besides, there was no proof that the company were qualified to sell. The defendants, therefore, did not bring themselves within the exemptions, and the case must go back to the magistrates with that intimation of opinion.

Mr. Justice Collins said he concurred, and for the same reasons.

Mr. Chitty applied for leave to appeal.

Mr. Justice Cave said he must first be satisfied that there was an appeal.

Mr. Danckwerts cited a case ("Mellor *v.* Dunham," 5 Q. B. D.), in which it had been held that there was not.

Leave refused.—*Times.*

## Obituary.

Notice has been received of the death of the following:—

On May 8, Henry Benjamin Dixon, Chemist and Druggist, late of Hanley. (Aged 40).

On May 21, Edwin Helliar, Chemist and Druggist, of Yeovil. (Aged 60). Deceased was a Town Councillor and Borough Magistrate, and had filled the office of Mayor on two occasions.

On May 22, Peter Brown, Chemist and Druggist, of Shotley Bridge, Durham. (Aged 69).

On May 24, Robert Bennett, Pharmaceutical Chemist, of Tunbridge Wells. (Aged 63).

On May 28, William Wilks Fell, Chemist and Druggist, of Emley, Yorks. (Aged 68).

## Correspondence.

### THE SALE OF POISONOUS PROPRIETARIES.

Sir,—The alternative method, advanced by Mr. Carteighe at the annual meeting, of treating an order for such a commodity as Easton's syrup by making a prescription of it, and so dispensing, is a very common-sense one, and one for which, in so far as your report shows Mr. Carteighe to have advocated its adoption, I have nothing but commendation. What I would comment upon is the peculiarly privileged position in which the qualified chemist is placed, privileged in this respect even beyond the medical practitioner, for, indeed, he is furnished with a royal road to defeat one of the chief aims of the Pharmacy Act should he elect to do so. A stranger recently asked me for a quantity of Fleming's tincture of aconite, and his conversation showed he knew a little about the action of that and of some other medicines he wished, yet I declined to supply him, notwithstanding his sneering remark that he got it, as well as certain other scheduled poisons, all around, and that without any poison-book humbug. I believe he spoke truly, and had I chosen to take his name, make an entry, and label his bottle according to its contents, I could not have been interfered with. So might we deal out any scheduled poison to known persons, or to strangers, combining it with something else, if need be, to bring it within the term dispensing. We would not be compelled to write directions as to dose, etc. This custom, I fear, will more and more be followed as the Pharmacy Act becomes more and more rigorously enforced. It has been said "the security of the public is, of course, obtained by the skill and knowledge of the man who sells," that is, should he choose to make it so. Bu therein lies the difficulty. No guarantee is provided that chemists will act conscientiously, and though on the whole they do, nevertheless trade competition forces good men to comply with customs, and to do things which, on calm reflection, trouble their conscience. Consideration of this privileged position is highly instructive, and a better argument could scarcely be adduced in favour of giving the Pharmaceutical Society power to exercise control over the conduct of its licencees, some arrangement for which I hope to see adopted sooner or later. Only those who will to be unscrupulous need object to discipline.

*Glasgow.* J. ANDERSON RUSSELL.

### PIPTOCALYX MOOREI.

Sir,—It may be well to put on record some results obtained in the preliminary examination of the leaves of the above plant, which were submitted to me about eighteen months ago for examination, as to the practicability of their employment as a bitter for beverage purposes. The quantity at my disposal was about a hundredweight, but, notwithstanding most careful search, no fruits or flowers could be found, and hence the identification of the drug was attended with considerable difficulty. Mr. Holmes' classification of the leaves as those of the above plant make the result of the examination of the more interest. The leaves have an intense but purely bitter taste, somewhat resembling chiretta, but are possessed of no characteristic smell. By aqueous infusion a very mucilaginous liquid was obtained, the amount of gummy matter present in the leaves precluding their use by direct extraction with water. The aqueous infusion after purification gave no indication of the presence of alkaloids, but reduced Fehling's solution very markedly. By exhaustion with alcohol an extract was obtained from which an intensely bitter substance was obtained, which possessed glucosidal properties, and which I have subsequently succeeded in crystallising. Now that the botanical source of the leaves has been determined, I propose to make a more extended examination of this body, with a view to determining whether the bitterness of the leaves is in whole or part dependent on it.

*Southwark, London.* JOHN C. UMNEY.

### UNAUTHORISED USE OF TITLES.

Sir,—I find in the Journal last week the names of no less than three persons who, in public courts, have described themselves as "chemists" during the past few days, "their names," as the foot-note remarks, "not appearing on the Register for 1894." In addition to these offenders is one who describes himself as an associate of the Society, with which it appears he is totally unconnected. Surely such flagrant breaches of the law will meet with prompt attention from the Council, and it would be pleasant news to the general body of the trade to find publicly through the Press that these persons have met with their deserts, if only to teach others of their kindred that qualified chemists are determined the law shall not be broken with impunity, and that the Society has power to prevent the assumption of their titles "Member" or "Associate" by those who have no right to use them.

*Norwich.* S. BENNETT BRITTAN.

## Answers to Correspondents.

*R. Goodwin Mumbray.*—It has always been the custom of the Society to discountenance the practice referred to, and we see no reason to depart from this rule.

*C. Wade.*—Yes, as you suggest, there is a slight printer's error in the first equation on page 1005. It should be—

$$2C_{23}H_{45}NO_{12} + I_2 = C_{23}H_{45}NO_{12}\cdot HI + C_{23}H_{44}INO_{12}.$$

*R. H.*—Apply to C. Baker, 244, High Holborn, W.C., who can probably attach one for you. Dr. Hartnack's address is Potsdam, near Berlin.

*Fair Play.*—Any particulars of such cases that may come under your notice should be reported to the Registrar.

*Exostosis.*—The hydrocarbons produced in the manufacture of gas are no doubt of the nature of benzene or of paraffins, according to the temperature at which they have been formed.

*J. R. Johnson.*—Your communication is under sideration.

## Books, etc., received.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASS CIATION AT THE FORTY-FIRST ANNUAL MEETING HE AT CHICAGO, ILL., AUGUST, 1893. Pp. i.-xxviii., 1 t 1087. Philadelphia, 1893. From the Association.

ANALYSES OF TWELVE THOUSAND PRESCRIPTIONS. Compiled by WM. MARTINDALE. Pp. i.-xiii., 1 to 504. 2s. 6d. net. London: H. K. Lewis. From the Publisher.

MICRO-ORGANISMS IN WATER. By PERCY FRANKLAN, Ph.D., B.Sc. (Lond.), F.R.S., and Mrs. PERCY FRANKLAND. Pp. i.-xi., 1 to 532. 16s. net. London: Longmans and Co. From the Publishers.

THE NATURAL HISTORY OF PLANTS. By KERNER an OLIVER. Part 2. 2s. 6*d*. net. London: Blackie an Son. From the Publishers.

CURTICE'S INDEX TO THE "TIMES" AND OTHER NEWSPAPERS. July 1 to September 30, 1893. Pp. 267. 12s. 6d. London: Edward Curtice. From the Publisher.

METHYLATED SPIRIT: A COMPENDIUM FOR THE RETAILE AND LABORATORY DIRECTOR, WITH SOME INFORMATI FOR THE PUBLIC. By ALGERNON WARREN. Pp. 14. 4*d*. Bristol: J. W. Arrowsmith. From the Author.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA. Seventeenth Edition. By H. C. WOOD, M.D., LL.D., JOSEPH P. REMINGTON, Ph.M., F.C.S., and SAMUEL P. SADTLER, Ph.D., F.C.S. Pp. i.-xliv., 1 to 1960, illustrated. Cloth 7·00 dollars, sheep 8·00 dollars. Philadelphia: J. B. Lippincott Company. From the Publishers.

THE NATIONAL DISPENSATORY. Fifth Edition. By ALFRE STILLÉ, M.D., LL.D., JOHN M. MAISCH, Phar.D., CHARLES CASPARI, Jr., Ph.G., and HENRY C. C. MAISCH, Ph.G., Ph.D. Pp. i.-viii., 1 to 1903, illustrated. 36s. London: J. and A. Churchill. From the Publishers.

RECHERCHES SUR LE CUBÈBE ET SUR LES PIPÉRACÉ QUI PEUVENT S'Y TROUVER. Par le Dr. A. DEWÈVR Pp. 64. Extrait des Annales publiées par la Sociét royale des sciences médicales et naturelles de Bruxell Bruxelles: Henri Lamertin. From the Author.

## Diary of the Week.

### WEDNESDAY, JUNE 13.

*Edinburgh District Chemists' Trade Association.*
Picnic at Norham Castle.

*Royal Society.*
Annual Conversazione.

### THURSDAY, JUNE 14.

*Royal Society*, at 4.30 p.m.
Ordinary Meeting.

*School of Pharmacy Students' Association*, at 7 p.m.
"Report on Inorganic Chemistry," by H. Gar

### FRIDAY, JUNE 15.

*Quekett Microscopical Club*, at 8 p.m.
Ordinary Meeting.

### SATURDAY, JUNE 16.

*Quekett Microscopical Club.*
Day Excursion to Whitstable. To meet at H
Viaduct Station.

*School of Pharmacy Students' Association.*
Botanical Excursion to Worcester Park.

*Pharmaceutical Cricket Club* v. *Cheam Com*
*Cuddington*, at Worcester Park, at 3 p.m.
Waterloo Station at 2.10 p.m.

*** Owing to pressure on our space the publi several communications is deferred.

COMMUNICATIONS, LETTERS, etc., received from Amos and Fowler, Bates, Clarke, Gill, Hi Rowell, Strachan, Stroud, Tallis, Wade, Warr

# NOTE ON SUPERFATTED SOAP

## AND LINIMENT OF IODIDE OF POTASSIUM WITH SUPERFATTED SOAP.

BY J. R. JOHNSON, PH.C.,

*Dispenser to the Royal Infirmary, Liverpool.*

Professor Unna recommends, as being more easily absorbed than the ordinary pharmacopœial liniment of iodide of potassium with soap, a liniment made from a 5 per cent. superfatted soap, prepared with benzoated lard and potash.

The formula as supplied to me was :—

| | |
|---|---|
| 5 per cent. superfatted soap, made from benzoated lard and potash ... | 9 parts. |
| Iodide of potassium (in a little [?] water) ... | 1 part. |

On attempting to prepare the above, much difficulty was experienced in making, in the first place, a perfectly neutral soap. In the absence of any information that would guide me as to the relative proportions of lard and caustic potash that would be required, it was necessary to start *ab initio*. The ordinary tests for alkalinity and acidity, litmus, phenol-phthalein, etc., are useless in dealing with soaps, and the test usually, I believe, employed and recommended, viz., the degree of acridity imparted to the tongue, is found to be most fallacious and misleading. At any rate, so far as a soap made with lard and caustic potash is concerned, it is quite impossible to arrive at neutrality by relying upon the tongue.

Casting round for a means of determining exact neutrality, I employed calomel as a test, with the greatest success. The slightest excess of potash in the soap at once reduces the mercurous salt. The method adopted was to heat together over a steam-bath for forty-eight hours weighed quantities of benzoated lard and caustic potash, adding 50 parts of water for every 100 parts of lard employed. The ingredients were frequently well stirred, and at the end of that time a small portion of the soap was rubbed upon a porcelain tile with a few grains of calomel. If excess of alkali had been used, the calomel was at once blackened. The test held readily to the tenth of a grain of the alkali when working with over 300 grains of the soap. With the samples of benzoated lard and caustic potash at my disposal, actual neutrality was obtained with the following proportions :—

| | |
|---|---|
| Benzoated lard ... | 100 parts. |
| Caustic potash ... | 27·3 „ |

Having thus prepared a neutral soap, it was an easy matter to put in an additional 5 per cent. of lard ; thus the figures for exact neutrality were, percentage :—

| | |
|---|---|
| Benzoated lard ... | 78 56 |
| Caustic potash ... | 21·44 |

with added 5 per cent. lard—

| | |
|---|---|
| Benzoated lard ... | 79·56 |
| Caustic potash ... | 20·42 |

or for a convenient quantity—

| | |
|---|---|
| Benzoated lard... | 1 lb. |
| Caustic potash ... | 4 ozs. 56 grains. |

In dealing with such a quantity, the potash is best previously dissolved in 4 ounces of water, and the benzoated lard and solution of potash kept well stirred together over a water-bath for three or four days, to ensure perfect combination. The resulting soap is fairly firm, somewhat resembling "crême d'amande" in consistency and appearance, but rather firmer.

To prepare the liniment of iodide of potassium with this superfatted soap, the following formula will be found to yield an excellent result :—

| | |
|---|---|
| Of 5 per cent. superfatted soap as above prepared ... | 1 oz. |
| Iodide of potassium ... | ʒiss. |
| Distilled water... | f℥vi. |

Dissolve the salt in the distilled water ; warm the soap with about half of the solution in a porcelain dish over a steam or water-bath, gradually add the rest of the solution, and beat together with a spatula until cold. The product is a smooth and white, creamy liniment, rubbing into the skin in a manner far preferable to the present uncertain pharmacopœial preparation. It is important in making the liniment to follow the above directions closely, as any other method ends in failure so far as the elegance of the liniment is concerned.

The strength of the liniment in the above formula is that suggested by Professor Unna, but of course a liniment of any required strength is as easily prepared, and ol. limonis or any other essential oil may be added if desired.

With regard to the calomel test for neutrality, I have had neither time nor occasion to extend its application to other soaps, but it is possible that it may be as useful in other combinations as in the case of lard and caustic potash.

# GLYCOGEN;

## ITS SOURCE AND CONVERSION.*

BY PROFESSOR W. D. HALLIBURTON, M.D., F.R.S.

Glycogen or animal starch was discovered by Claude Bernard some fifty years ago, but every year something is added to our knowledge of it. It is yet, however, matter of doubt as to what glycogen is formed from and what is its ultimate fate. The view usually accepted at the present day is that both proteid and carbohydrate foods may act as sources of the compound. It is most abundant after carbohydrate food, but also occurs in animals kept on a proteid diet, originating then by complex intra-protoplasmic or metabolic changes. In the former case it is probably a storage of reserve carbohydrate, and the chemical processes involved are simpler. It has been proved by experiment that dextrose, levulose, cane sugar, and maltose increase the glycogen ; whilst lactose and galactose do so very slightly, if at all. The liver appears to form glycogen from those sugars which are converted into dextrose and levulose before they reach it. As to the ultimate fate of the compound, Bernard has held that its conversion is due to an enzyme, whereas recent writers attribute it to the vital action of the liver protoplasm. The conversion is divided into two periods, and the results of experiments by recent investigators agree in regarding sugar (dextrose) as the result of the disappearance of glycogen, and that this change is due to an enzyme that is present. It is not clear, however, that the whole conversion is accomplished by the ferment, for the vital action (generally a dehydration) of the cell was not reckoned with in these experiments. Recent research has shown that it may be possible to obtain sugar from proteid, but in no case as yet has dextrose been thus obtained, though laboratory experiments have shown that other sugars are obtainable.

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* Abstract of a paper in *Science Progress* for June

## TERPENELESS VOLATILE OILS.[*]

BY PROF. VIRGIL COBLENTZ.

The older method of the classification of the volatile oils into those containing oxygen and those free from this has been dropped, since many of those oils which were formerly looked upon as being free from oxygen are now found to contain it, in the residual portions, their presence having been overlooked by the early investigators, since in some instances they exist in only very small amounts.

As far back as 1840 Völckel and Schweitzer, in examining the oil of caraway, separated a portion which possessed the characteristic odour from the relative inodorous constituent. Later, Völckel demonstrated that this odorous constituent contained oxygen, and named it carvol. Later investigators have verified this work and found that the oil contains from 45 to 65 per cent. of this carvol (odorous constituent), the balance consisting of an inodorous terpene—limonene, $C_{10}H_{16}$. This work has been followed up by such investigators as Wallach, Semmler, Flückiger, Geissler, and others, who have cleared up the matter concerning the nature and constituents of the larger number of the volatile oils. The majority of the volatile oils consist of a mixture of two or more bodies; one class of these we designate by the general name terpene, the other class constitute the oxygenated portion to which in main the odour of the oil is due. These terpenes, that is to say, hydrocarbons of the general formula $C_{10}H_{16}$ (fraction or multiple thereof), include a large number of bodies; their difference in composition may be explained through their isomeric and polymeric forms. They are, as a class, comparatively inactive; on exposure to air they readily absorb oxygen, resinify and take on an unpleasant terebinthinate odour and taste, which is, of course, very destructive to the odour and flavour of the volatile oil of which it may be a constituent. This is particularly evident in the case of the oils of lemon and orange, where the value depends upon the delicacy of the odour and flavour. These terpenes possess a lower density than the oils from which they are obtained, take no part in the flavour of the oil, and are insoluble in dilute alcohol; hence, the solubility of the oil depends largely on the comparative amount of terpene present.

As before stated, many volatile oils contain, besides the terpenes, an oxygenated or odorous constituent, which is often deposited as a crystalline mass on exposure to cold, or is separated by fractional distillation. Bodies in this class were named by Berzelius stearoptens, by Nauman camphors. These stearoptens are characterised by high density, higher boiling point, ready solubility in weaker alcoholic liquids. We find among them alcohols, phenols, ketones, aldehydes, etc.

For example, the stearopten of the oils of caraway and dill is carvol, a ketone; of cinnamon cinnamic aldehyde; of lemon citrol, an aldehyde; of anise anethol, a phenol derivative; of peppermint menthol, an alcohol; of thyme thymol, a phenol; coriander and angelica contain a mixture of compounds. It is evident that where the odour of an oil resides in this oxygenated portion, which is not subject to change or resinification, and is also soluble in diluted alcohol, when separated it would afford a valuable substitute for the oil itself.

These facts were first utilised and developed through the efforts of Heinrich Haensel, of Pirna, in 1876, when he demonstrated that carvol is the only valuable constituent in oil of caraway. The "concentrated" oil of caraway was soon followed by the "concentrated" oils of clove, peppermint, lavender, bergamot, lemon, orange, and others. The true value of these discoveries was not recognised until Professor Geissler, in 1881, and Professor Flückiger, in 1883, published the results of their investigations of the active constituents of the oils of lemon, orange, and angelica. Geissler described the terpeneless oil of lemon, stating that it far exceeds the commercial oil in strength of odour and flavour, stability, solubility, and strength; being an oxygenated liquid, like all others of this class, of constant boiling point, composition, and specific gravity; the commercial oil of lemon having the specific gravity of 0·860, the terpene, citrene, 0·850, while the terpeneless oxygenated portion has the gravity of 0·900.

The insolubility of the volatile oils is often the source of annoyance and loss, since in the preparation of the aromatic extract the addition of oils renders the solutions turbid, with the separation of a portion of the oil, and renders subsequent clarification necessary, which entails a loss of material and time. The presence of these terpenes gives rise to other difficulties, besides hindering the solubility, in connection with their use in essences, confections, etc. Although the oil employed may be fresh and sweet, the articles flavoured will, on standing, gradually develop a terebinthinate odour and taste, due to the oxidation of the terpenes in the oil. Thus we see that the presence of these terpenes in many oils simply covers the true flavour, and is a constant source of menace to their quality.

As will be seen from the list below, the strength of such a concentrated oil must vary, according to the comparative amount of terpenes contained in the crude oil; the smaller the amount of the oxygenated constituent after the removal of the terpenes the more concentrated is the product. We find them varying from twice to thirty times the strength of the natural oil. The value of these products may be summed up as follows: Great concentration, easy solubility, and freedom from the terebinthinate odour or flavour. These points adapt them specially in the manufacture of liquors, essences, perfumes, confections, etc.

| | Comparative strength to other oils. |
|---|---|
| Terpeneless Oils of Angelica, Lemon, Orange | 30x |
| Terpeneless Oil of Juniper Berries | 20x |
| " " Calamus | 8x |
| " " Wormwood | 10x |
| " " Coriander Seed | 6x |
| " " Thyme | 5x |
| " Oils of Cumin, Laurel, Mace, Rosemary | 4x |
| Terpeneless Oils of Anise, Bergamot, Caraway, Cassia, Clove, Fennel, Lavender, Lemon-grass, Peppermint, Pimenta, Sassafras | 2 to 3x |

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[*] From the *Alumni Journal.*

## SPICES AND CONDIMENTS IN THE UNITED STATES.

Part 2 of Bulletin No. 13 of the U.S. Department of Agriculture, Division of Chemistry, is devoted to a popular exposition of the origin of spices and the means employed for their adulteration, and contains as well an extended technical discussion of the subject and of the results of analysis both microscopical and chemical, and the methods which have been proposed by recent authorities for the detection of sophistication. The table of contaminations here given will furnish an idea of the extent to which the ingenuity of spice mixers has gone.

*Table of Spices and Adulterants.*

| Spices. | Adulterants. |
|---|---|
| Allspice ..... | Spent cloves, clove stems, cracker dust, *ground shells* or charcoal, *mineral colour*, *yellow corn*. |
| Cayenne .... | *Rice flour*, salt and ship stuff, *yellow corn*, *turmeric*, and *mineral red*. |
| Cassia ......... | *Ground shells* and *crackers*, *turmeric*, *minerals*. |
| Cinnamon...... | *Cassia*, peas, starch, *mustard hulls*, *turmeric*, *minerals*, *cracker dust*, *burnt shells* or charcoal. |
| Cloves ......... | *Spent cloves*, *clove stems*, *minerals*, allspice, roasted shells, wheat flour, peas. |
| Ginger ......... | *Cereals*, *turmeric*, *mustard hulls*, *cayenne*, peas. |
| Mace............ | Cereals or starch, buckwheat, *wild mace*. |
| Nutmeg ...... | Cereals or starch, wild nutmeg. |
| Pepper ......... | *Refuse of all sorts*, *pepper dust*, *ground crackers*, or *ship stuff; rice*, *mustard hulls*, *charcoal*, cocoanut shells, *cayenne*, beans, *bran*, *yellow corn*. |
| Mustard ...... | *Cereals* and *starch*, *turmeric*, peas, *yellow corn meal*, *ginger*, *gypsum*. |

The materials in italics have been identified in spices examined in the laboratory of this division, but some of the commoner adulterants have not been found. Considering the spices individually there are certain peculiarities, as they are met with pure and in the trade, which should not be overlooked.

### *Mustard.*

Mustard, as sold in the ground state, should be the farina or flour of the black or white mustard seed—that is to say, the flour from the interior of the seed bolted or separated from the hulls. The two kinds of seed, although derived from plants of the same genus, are somewhat different in their chemical composition. The black seed is much the more pungent, and develops, on mixing with water, a volatile oil, which gives this condiment its penetrating character. There is also present in the seed a complicated organic substance of a bitter nature, to which is due some of the peculiar flavour, and while the white seed forms no volatile oil with water, it contains more of the bitter substance. It is, therefore, very common to mix the two in grinding. The sources of the seed are various. In our markets at present there are quoted California black and white, Dutch, Trieste black, and English—the last being the most valuable.

In the manufacture of the seed into flour for the market two customs have arisen which change the nature of the original substance, and therefore would commonly come under the head of adulteration. One is extremely old, the addition of wheat flour for the purpose of making the condiment keep better. This necessitates the restoration of the yellow colour by turmeric, or other dye stuff. These diluents are harmless, as a rule, but there seems to be no reason for their use, and it is gradually becoming commoner to find mustard free from them in English brands.

The other custom is the abstraction of the fixed oil by pressure before grinding the seed. The percentage of this oil is over 30. It adds nothing to the flavour of the mustard, probably injures its keeping qualities, makes the seed more difficult to mill, and its removal is therefore a benefit. It is a nearly universal custom at the present day in this country, and is not considered as fraudulent by the Canadian analysts.

Falsifications of mustard other than those mentioned are not common, although gypsum has been found in low-grade mustard and several other adulterants, among them ginger of low grade. The hulls bolted from the flour in the process of manufacture are preserved and form the basis of the adulteration of many other spices.

### *Pepper, Black and White.*

Pepper is more in demand than any other spice, and in consequence is more adulterated. Its appearance in the ground form, especially of the black, is such as to make it possible to use all sorts of refuse for this purpose, and almost everything that has been used as an adulterant has been found in pepper. White pepper, which is simply the black deprived of its outer black coats, is, of course, less easily falsified; but in France it is diluted to an immense extent with ground olive stones, which bear a striking resemblance to it. Among the samples from Washington grocers pepper sweepings—that is, husks and dirt—rice or corn, and mustard hulls were the commonest admixtures. Sand is said to be very commonly added abroad, but has not been met with here. In Canada and New York ground coconut shells are a cheap source of adulteration, but they have not extended so far south.

Specimens from Baltimore mills of very low quality goods were found to contain but little pepper, and that of the worst quality, being made up of cracker dust, yellow corn, cayenne, and charcoal, in so disgraceful a way as to be visible to the unassisted eye on close examination.

The quality of a ground pepper can be told by an expert from its weight and colour, and on examination with a lens of low magnifying power. The particles are not coarsely ground, and it is not difficult to pick out pieces of husk, yellow corn and rice, and, if necessary, a more careful investigation under a microscope of higher power will serve for confirmation. Black pepper, in our experience, is much more liable to adulteration than white, although it is perfectly easy to dilute the latter with broken rice or cracker dust, which are inexpensive. All these materials, fortunately, owing to the grossness of the adulteration, are readily recognised, and there is hardly the necessity for recourse to chemical analysis. There has been, however, considerable investigation in this direction, so that there are means of confirming the optical examination which are of great value. Determination of the amount of starch is one of the methods upon which some reliance can be placed; for if under the microscope foreign starch is not detected, then the addition of "P. D." or other starch free adulterants will diminish the percentage found, and the reverse. In this way, too, one is able to arrive at an approximate conclusion as to the proportion of adulterants added, which can only be estimated within wide limits under the microscope.

In spite of the immense amount of adulteration, it is possible from the best shops to obtain pure ground peppers, but it is, at the same time, safer to grind the whole berries with a family spice-mill as they are needed. The sources of our pepper supply are Tellicherry on the west coast of Hindostan, which is graded high, and Penang and Singapore for the East, Sumatra, Java, etc. The importations are principally through London, and not direct. The supply of ground pepper from England will usually be found more pure than our own brands and, at the same time, is naturally more expensive.

### *Cayenne or Red Pepper.*

This condiment should consist of the ground pods of any of several species of *Capsicum*, known as chilies or red peppers. It is said to have been adulterated with many substances, brick dust, red lead, and colouring matters; but this has only been found to be the case in two cheap Baltimore cayennes; while in Washington only rice has been detected, but that quite frequently. Inferior material is no doubt often ground, but the small value of the pods and the small quantity consumed does not tend to increase adulteration.

### *Ginger.*

Ginger is the root, or, technically, rhizome, of a plant somewhat similar in appearance to our iris and flag. It is grown in various parts of the world and prepared with great care and great carelessness, being at times scraped and bleached, at others simply dried in any condition, so that there is an immense number of varieties and qualities to be found in the market. They all, however, retain sufficiently the marked peculiarities of the starchy fibrous root to make the detection of adulterants easy. The common ones are the addition of wheat flour or some starch as a diluent, the colouring with turmeric to suit a popular fancy for gingerbread, or of spent material which has been used in making tincture. Mustard hulls and cayenne are also found in some cases, but have seldom been detected here. They are added to give pungency and make up for the addition of flour. Their detection is easy. The sources of our supply are Jamaica and the West Indies, Cochin China, Africa, and India. Jamaica is the best and most carefully prepared.

### *Cloves.*

The flower buds of the clove tree carefully picked and dried constitute the spice known by that name. Their valuable properties are due to the volatile oil which they contain, the best having as much as 16 per cent.

The removal of this oil is so very easy that it is the commonest method of deception to do so before grinding the spice, and to then dispose of it as pure. We have ready means of determining the loss chemically, but the microscope gives no indications. The addition of the cheaper clove stems is also practised, as they cost but 6 cents, when the buds cost 27. The microscope reveals their presence by certain cells which they contain, which are absent in the buds.

Pimento is sometimes substituted in part or entirely, as it has a clovelike flavour, but only 4 or 5 per cent. of volatile oil. It is worth less than one-fifth the price of cloves. Its chemical composition and its structure, that of a berry, reveals its presence. The addition of the coarser adulterants, mineral matter, coconut shells, flour, peas, and the like, have only been observed in two instances, but no doubt frequently occur, as has been found in Canada.

The sources of our supply are the East Indies (Amboyna), African (Zanzibar), and American, ranking in value in the order named. Cloves should, if possible, be always purchased whole, as they deteriorate less readily in that form.

### *Cinnamon and Cassia.*

These spices are the barks of several species of the genus *Cinnamonum*, the true cinnamon being a native of Ceylon, where it is largely cultivated, and the cassias being derived from several other species growing in China, India, and the East Indies. Cinnamon as it reaches the market is very thin, the outer and inner coats of the bark having been removed. Cassia, on the other hand, is thick, as it consists of the entire bark, and can be distinguished by its retaining its natural outer surface. Cinnamon is by far more valuable than the cassia, as there is a smaller supply, and intrinsically it contains a much greater proportion of volatile oil, and that of higher and more delicate aroma. In consequence, cassia is largely substituted for cinnamon, and, in fact, not a particle of ground cinnamon can be found in the market. It can be found in the whole condition in good quality only in drug stores. Cassia exists in many forms and qualities, and sells wholesale at from 7 to 40 cents a pound. That known as Saigon is the best, and that exported from Batavia the poorest. Cassia buds also hold a small place in the market.

The detection of the substitution of cassia for cinnamon, since the barks are of trees of the same species, is more difficult than is usually the case, and may prove troublesome to a novice. The presence of more woody fibre in the latter with the aid of chemical analysis serves, however, as a reliable distinction. In the samples which have come into our hands, not a particle of material labelled ground cinnamon proved to be anything other than cassia. The spice millers appeared, however, to be satisfied to stop at this point, and in only one case was there addition of cheap stuff to the cassia. When added, there is no difficulty in detecting it, as has been done here and in Canada, where peas, starch, ground shells, and crackers have been found in powder labelled both cassia and cinnamon.

The barks can, in most cases, and especially the cinnamon, be used nearly as well in the whole con-tion, and should at least be so purchased and then ground. A slight acquaintance with the appearance of the different qualities will teach one the proper selection to make.

### *Nutmeg and Mace.*

These spices are different portions of the fruit of a tree known as the nutmeg tree, *Myristica fragrans*, the nutmeg being the inner kernel, and the mace one of the outer coats or arillus. The tree grows principally on the Banda Islands, and the spices reach us through London. They can always be obtained in their original condition, and should be so purchased. When ground they are mixed with diluents of various descriptions, principally cereals and their refuse, which are easily detected. Owing to the infrequency of the sale of the powdered nutmeg and mace, their adulteration has attracted but little attention.—*American Druggist.*

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## THE MANUFACTURE OF CALOMEL IN JAPAN.*

BY EDWARD DIVERS, M.D., F.R.S.

*Introductory.*—Calomel, in the form common in England and all countries under western civilisation, is now extensively used, and is even manufactured in Japan, under the name of 'kankō.' But mercurous chloride is also largely used there, under the name of 'light powder' or 'keifun' (Chinese, *kingfun*), in another and very much older form, which is of signal purity, and made by a simple process as yet quite unknown in Europe, which I witnessed from beginning to end some years ago.

*Historical.*—According to Terajima Hokyō and Ono Ranzan, writers who lived in the last century, the first-named perhaps a little earlier, calomel was known in Japan as far back, at least, as the beginning of the eighth century, having then been presented to the Empress Gen-miyo; but their authority is the 'Zoku Nihongi,' reference to which, Professor Haga, F.C.S., informs me, makes it clear that mercury itself, not its chloride, was the thing presented.

In the time of the writers above named, mercurous chloride was well known and was manufactured in Japan, not only at Isawa, a village in Isé, where it is still made, but also in the city of Osaka and in a town near it, called Sakai. Mr. H. Kokubu, manufacturer, tells me that records exist at Isawamura of his family having carried on the manufacture of 'keifun' there for the last three hundred years.

Far earlier, namely, in the tenth century, Minamoto-no-Shitagō, in his work entitled 'Wamiyo-Ruijūsho,' makes mention of a mercurial preparation named 'kōfun,' or 'powder of mercury.' It is, however, questionable whether this was mercurous chloride or mercuric oxide, and therefore whether calomel was known or not at this time. But since calomel, under the name of 'keifun,' is mentioned by Chinese writers even earlier than this, it may be safely accepted that Japanese knowledge of this body is older than ours in Europe. The western knowlege of chloride of mercury dates from the first half of the sixteenth century, but the distinction between calomel and corrosive sublimate was not recognised till near the end of that century.

*Literary.*—The literature on Japanese calomel is meagre. Japanese writers of the old school have contented themselves for the most part with translating Chinese writings. Ono Ranzan mentions that the Japanese method differs from the Chinese in making use of water in place of alum and other chemicals, in which he came near the truth. The late Dr. Geerts, a Dutch pharmacist, who in the Government service did much in establishing Western pharmacy in Japan, treated of 'keifun' in some metallurgical contributions he made to the *Transactions of the Asiatic Society of Japan.* What he wrote is contained in vol. iv., 1875, and consists of information almost exclusively about Chinese calomel, and derived more from Chinese and Japanese writings than from any experience of his own. Concerning Chinese calomel, English readers have the 'Notes on Chinese Materia Medica,' among the science papers by the late Daniel Hanbury, F.R.S., edited by J. Ince. Hanbury mentions, as the result of his own observation, the characters of 'kingfun' and its great purity but for the presence of minute, transparent, acicular crystals of calcium sulphate. He refers to Porter Smith's 'Contributions towards the Materia Medica and Natural History of China' for an account of the manufacture. Smith, however, takes his information solely from Pearson's account on p. 59, vol. iii., of Sir J. Davis's work 'On the Chinese.' I have not seen this book, but it is clear from Porter Smith that Pearson, again, has only derived his information from the Chinese Materia Medica, 'Pun-tsaou-kang-muh,' and not from his own observation, and it amounts to this:—Common salt and mercury, of each 1 oz.; alum, 2 oz.; or salt, mercury, copperas and saltpetre, in some such proportions, are rubbed together and put into an iron bowl, which is then covered with a roomy earthen dish, well luted down. This is exposed to the heat of a strong charcoal fire for four or five hours, when water is thrown on the cover and the cover taken off. On its inner surface the calomel is found adhering in the form of a beautiful, feathery-white sublimate. Ten parts of mercury are said to yield about eight parts of calomel. Dr. Geerts's paper, already referred to, contains essentially the same account, translated from the Japanese version of the Chinese work.

Lastly, there is a paper in the Japanese language, on the manufacture of 'keifun' at Isé, which is the forerunner of the present one. That paper appeared in 1887 in the *Journal of the Tokyo Chemical Society* written by Mr. T. Shimidzu, M.E., F.C.S., my former pupil and colleague, and it was his description to me of what he had seen that led to my own visit to Isé in company with Professor Haga in the following year. In one or two points I have availed myself of this paper to make my own account more complete.

*Of the Specific Properties of Keifun.*—'Keifun' is in very thin minute scales, lustrous, transparent, and white or faintly cream-coloured. It might be described as micaceous calomel. To the touch it is soft and smooth. Measured in bulk, dry, it is four times as voluminous, more or less, as the ground calomel prepared by the European process, and can be readily scattered by a puff of the breath. Rubbed hard in a porcelain mortar it gives the brown resinous streak characteristic of calomel, and the evidence, therefore, according to pharmaceutical authorities, of its freedom from corrosive sublimate. Exposed to bright sunlight it gradually assumes a light brown colour, a colour, that is, having no affinity to grey or black. Moisture does not seem to favour this change, which is certainly not owing to any reduction to metal. European calomel suffers a similar change. 'Keifun' is free from corrosive sublimate and from metallic mercury.

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* From the *Journal of the Society of Chemical Industry.*

Hanbury found selenite in Chinese calomel, and Geerts found calomel of this form generally adulterated with selenite and mica, but whether what he examined was ever Japanese and not always imported Chinese calomel he does not show. I have found 'keifun' as it came direct from Isé quite free from adulteration, and have not met with any adulterated.

*Of the Materials used in making Calomel in Isé, Japan.*—The materials for making Japanese calomel are: Mercury, an arenaceous red clayey earth, bay-salt, bittern or salt-mothers, and air. The mercury is imported from Europe, but in old times is said to have been found in the neighbourhood of Isé, as cinnabar.

The earth, called 'mitsuchi' ('seed-earth'), is all taken from a neighbouring hill, Shunakayama, and, according to Mr. Kokubu, many other clays have been tried in place of it, always with bad results. It is of a rather light bright red colour, which changes to a duller and somewhat brown red on drying and gently heating the earth, and to a light ordinary brick red by a strong heat. As mined, the earth is seen to consist largely of colourless quartz grains. Besides the quartz a very little biotite is seen sparkling through it. The fresh damp earth does not form a compact mass, but a slightly cohering aggregate of damp crumbs. This texture appears to be due to the earth being a mass of quartz in small grains, from the size of a hempseed down to that of impalpable particles, held together by plastic clay. For use, that which does not contain coarse quartz grains too abundantly is selected, and is made into briquettes and moderately baked on the hearth of the fire-place under the calomel pots. These briquettes are then as light and porous as the prepared porous clay used in Fletcher's gas-furnaces. The raw earth, air-dried, is readily rubbed into its constituents by the fingers; and the baked briquettes very easily and rapidly reduced to a soft powder, quartz grains and all, in the agate mortar. The larger grains of quartz in the raw earth are also very brittle. I have treated thus fully of the mechanical characters of the earth, because probably much of its efficiency is due to them. But its chemical character also calls for notice. As baked ready for use it contains in the thoroughly air-dry condition still 5 per cent. and more of water. Before ignition it is almost entirely decomposed by sulphuric acid, either in some days in the cold or quickly by heat. It is also largely acted upon by hot hydrochloric acid, and heated in sealed tubes with this acid to 120°-150°, it is almost as fully decomposed as by sulphuric acid. It contains practically no silica soluble in hot sodium carbonate solution, but after acid treatment yields, of course, much silica to this reagent. The composition of the earth, as found in use at the works, but rendered anhydrous, is as follows:—

| | |
|---|---|
| Quartz | 38·4 |
| Combined silica | 24 2 |
| Alumina | 26·3 |
| Ferric oxide | 10·5 |
| Magnesia | 0·3 |
| | 99·7 |

The magnesia is only got by fusion of the finely-ground earth with alkali carbonate, and belongs to the particles of mica scattered through it. Only doubtful traces of phosphoric acid could be found, and, what is specially to be noted, no lime whatever. The earth is thus nothing but quartz, kaolin, ferric hydroxide, and a very little biotite, and is probably valuable to the calomel maker not only for its highly porous texture, but also for its negative chemical qualities.

The bittern and even the rough bay-salt contain magnesium chloride, and this rather than sodium chloride must be the source of hydrochloric acid in the process. That air finds a graduated entrance to the other materials by diffusion during the process will become evident from a consideration of the set-up of the apparatus.

(*To be continued.*)

## CANAIGRE.

Canaigre is a tanning agent. It is a species of sour dock, and the dried root contains about 33½ per cent. of tannic acid, or a higher average than the very best oak bark. It grows wild on most of the New Mexican plains or "mesas," and in that state yields from one ton to four tons to the acre, and in rare instances five tons. Under very simple cultivation and scanty irrigation the yield is at least ten tons per acre, and it will average ten tons to twenty tons. The United States experiment station attached to the Agricultural College at La Cruces has two fields planted now, one irrigated, the other dry. The habits and evolution of this plant from the wild to the cultivated state are being closely watched and recorded. At Deming extracting works have been erected, and the product is being shipped to several tanneries in the United States and England.—*Consular Report.*

## COLOCYNTH IN TURKEY.

Colocynth, although in demand in the European markets, was not exported in such considerable quantities in 1893 as during the previous year. It is gathered by the Arabs in the vicinity of Gaza, where it grows wild, but in consequence of the levying of the tithe by the authorities, which has of late been exacted from the exporters, instead of from the Bedouins who collect the article, shipments were somewhat less in 1893 than in 1892.—*Consular Report.*

The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*SATURDAY, JUNE 16, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* Editor, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* Mr. Richard Bremridge, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* Pharmaceutical Journal, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "Street Brothers."

## THE PHARMACY ACT IN SCOTLAND.

The judgment delivered in the Appeal Court, Edinburgh, in regard to the question of unqualified assistants in chemists' shops kept by medical men, is commented upon by the local papers with complete approval. The technical plea that sales of poison by an assistant are really sales by his master is regarded by the *Evening Gazette* as absurd, so far as the chief object of the Pharmacy Act is concerned and when urged as a defence of such a sale by an unqualified assistant, since it virtually means that the qualification upon which the Legislature insists, as being essential for the safety of the public, would, after all, count for nothing if a doctor might spend the whole day in visiting his patients while poisons were hourly sold or dispensed in his shop by an unqualified boy. The view held by the majority of the judges that such could not have been the intention of the Legislature is regarded as being in accordance with both equity and common sense.

The *Evening Express* in like manner remarks that if the Act is to serve any useful purpose at all, it is essential that poison should not reach the hands of the public except through the medium of an individual possessing the statutory qualification, and that the proprietor of a shop should not be allowed to transfer his responsibility to an unqualified assistant. The *Scottish Leader* finds it really difficult to see how the minority of the judges could have arrived at a contrary view, since the actual supply of poisons by incompetent persons is precisely the great evil which the Pharmacy Acts were intended to redress. It also adds that the qualification of the proprietor of a shop would be of no value for the safety of the public if an unqualified assistant were allowed to sell or dispense poison on his behalf in the same way that he might perform other duties of the business. These expressions of opinion from a popular common-sense point of view show that the object and intention of the Pharmacy Act are properly appreciated.

In regard to doctors' shops, the judgment forms an appropriate supplement to that given in the Wheeldon case. It is now made clear that whether a chemist's shop be kept by a person qualified under the Pharmacy Act or by a medical man in virtue of his exemption from that requirement, the retailing, compounding, and dispensing of poisons cannot lawfully be carried out by any but duly qualified persons. The exemption of the medical man enables him to keep open shop and personally to sell, compound, and dispense poisons, in recognition of his competence to perform these duties; but it does not release him from the general obligations attaching to the position of a chemist and druggist, and in carrying on that business a medical man stands otherwise in exactly the same position as a person qualified under the Pharmacy Act.

The primary importance of personal qualification on the part of those actually engaged in the work of selling, etc., has always been recognised by the Pharmaceutical Society. It is, in fact, a necessary complement of the qualification of a proprietor. The applicability of that principle in the administration of the Pharmacy Act, 1868, was first made clearly apparent by the decision of Lord Selborne in the case of the London and Provincial Supply Association, and the necessity of insisting upon it in all instances is a natural corollary of that decision. It is now decisively established that this principle applies generally, without any exception, and that circumstance is no small compensation for the insufficiency of the law to prevent the business of a chemist and druggist being carried on by a proprietary company consisting of unqualified persons, since this cannot be done except through the medium of qualified assistants. There is now no ground for the complaint that while chemists and druggists are required to employ qualified assistants for the sale of poisons, medical men keeping chemists' shops need not do so. Neither can the existence of any such unreasonable difference be urged by chemists and druggists as an excuse for not complying with the statutory requirements relating to the sale of poison.

## ROYAL SOCIETY SOIRÉE.

The second conversazione of this society for the present session was held at Burlington House on Wednesday evening, when the guests were received by the President, Lord Kelvin, and his wife. Lantern demonstrations were given on the ground floor during the evening. Thus Professor E. B. Poulton, F.R.S., illustrated the results of recent work upon the influence of environment upon the colours of certain lepidopterous larvæ, variously coloured twigs and shoots having been shown to influence the appearance of many twig-like larvæ in such a manner as to conceal them. During the summer of 1893 certain larvæ of two species (*Gastropacha quercifolia* and *Odontoptera bidentata*) were surrounded, during their growth, with lichen-covered twigs. Larvæ thus treated developed lichen-like marks upon the body. Mr. D. Morris, M.A., C.M.G., also exhibited a series of views illustrating the leading features of tropical vegetation, and supplemented them by explanatory remarks based on his own experience in the tropics. In an adjoining room Professor Elisha Gray exhibited the "telautograph," by means of which fac-similes of handwriting, sketches, plans, etc., may be transmitted to distant stations by electricity. On this occasion the resistance corresponded to a distance of two hundred miles between the transmitter and receiver, and handwriting up to thirty words a minute was perfectly reproduced. Dried specimens of Cape plants were exhibited by the Director of Kew Gardens; Mr. Shelford Bidwell, F.R.S., gave illustrations of recurrent vision and retinal oscillations; Professor H. Marshall Ward, F.R.S., exhibited a series of drawings of colonies and cultures of bacteria isolated from Thames water; Mr. A. E. Tutton, an instrument of precision for producing monochromatic light of any desired wave-length, designed for use in investigating the optical properties of crystals; and Mr. Charles Bradbury, the "Brunsviga" calculating machine, which will add, multiply, subtract, or divide with absolute accuracy, giving products in plain figures or decimals up to thirteen or eighteen figures, according to the size of the machine used. Mr. Charles Baker exhibited an ingenious apparatus for obtaining instantaneous photo-micrographs, the image being visible on a small screen at right angles to the optic axis up to the moment of exposure. References to work done by means of this apparatus will be found in reports of meetings on page 1056. Mr. C. T. Snedekor showed an apparatus for heating articles by electricity for hospital purposes, any required degree of temperature being readily obtained and uniformly maintained. The coil is enclosed in an elastic and flexible case, with a silk or woollen covering, so that it can be applied to and envelop any part of the body as a fomentation. It can also be used for a domestic Turkish bath, or used as a footwarmer, and generally for warming purposes in the bedroom or carriage. Gold leaf made by electro-deposition was shown by Mr. J. W. Swan, F.R.S. The leaves are prepared by depositing a thin film of gold on a highly polished and extremely thin electro-copper deposit. The copper is then dissolved by perchloride of iron, leaving the gold in an exceedingly attenuated condition. The leaves shown were approximately four millionths of an inch thick, and those mounted on glass showed the transparency of gold very perfectly when a lighted lamp was looked at through them, the decided green colour of the gold being also very evident. Other exhibits of interest were photographs of splashing drops by Professor A. M. Worthington, F.R.S., and Mr. R. S. Cole, M.A.; and photographic prints in the natural colours, obtained by Dr. Vögel's process of printing in the three primary colours only. By the intervention of suitable media, three photographs are obtained, severally appropriate to the three primary colours composing the original picture or view required to be reproduced. From these three photographs printing blocks are prepared which, being printed from in red, yellow, and blue ink, give the multi-coloured effects shown by the specimens exhibited.

## PHARMACOPŒIA REVISION.

The sound of the flourish of trumpets in reference to this subject has now died away without being followed by any intimation that the work is being undertaken, or that steps are being taken to carry out the contemplated arrangements. There are probably sufficient reasons for the apparent delay in entering upon work which will necessarily be laborious and occupy considerable time. But since the publication of the substance of Professor Attfield's report on this subject, various communications have been received giving evidence of the interest which pharmacists may naturally be expected to take in the amendment and perfecting of the national medicine book. We have felt some difficulty in deciding how to deal with these communications, in which criticism of the present pharmacopœia is associated with suggestions for improvement in various respects. On the whole, it appears desirable that these communications should be published in the form of letters, duly authenticated with the names of the writers, and the first of them will be found at page 1062 in the present number of the Journal. We would suggest to our readers that the beginning thus made should be followed up by practical pharmacists communicating the results of their experience, and any suggestions they may think desirable to make.

## NORTH BRITISH BRANCH.

A meeting of the members and associates in business of the Society, residing in Scotland, will be held in the Society's House, 36, York Place, Edinburgh, on Thursday, June 21, at twelve noon precisely, when the result of the election of the Executive will be announced. The voting papers for the election are now being issued, and amongst the names of persons eligible and willing for election are those of sixteen members of the retiring Executive who are eligible for re-election, in addition to those of Messrs. C. F. Henry (Edinburgh), R. T. McCowan (Paisley), D. McLaren (Edinburgh), and J. Moir (Glasgow). Seventeen members require to be elected, making, with the President and Vice-President of the Society and the two members of Council resident in Scotland, a total of twenty-one.

## ENGAGEMENTS WANTED.

A notice appears in the advertising columns of this week's Journal stating that, in future, advertisements of assistants seeking engagements will be inserted in the *Pharmaceutical Journal* free of charge, subject to conditions there stated. To secure insertion of such advertisements in the current number for the week they must reach the office of the advertising agents, Messrs. Street Brothers, 5, Serle Street, Lincoln's Inn, W.C., not later than ten o'clock on Thursday morning.

# Transactions of the Pharmaceutical Society of Great Britain.

## DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 13th inst., the Librarian and Curator presented the following report of donations to the Society's Libraries and Museums:—

### *To the Library in London.*

**Kaiserliche Leopoldinisch - Carelinische Deutsche Akademie der Naturforscher:**
Nova Acta, Band 59–60.

**Professor F. A. Flückiger, Bern:**
Thirteen pamphlets on various subjects.

**Pharmacy Board of Victoria:**
Report for 1893.

**American Pharmaceutical Association:**
Proceedings, 1893, vol. 41.

**Professor J. P. Remington, Philadelphia:**
United States Dispensatory, 17th ed., 1894.

**Mr. John Gower, Ealing:**
Practical Histological Botany, by F. Davis.

**Mr. W. Martindale, London:**
Analyses of 12,000 prescriptions, 1894.

**University of London:**
Calendar, 1894.

**Dr. A. De Wèvre:**
Recherches sur le cubèbe, etc., 1894.

**Middlesex Hospital, London:**
Reports for 1892.

### *To the Museum in London.*

**Mr. J. C. S. Sawyer, London:**
A medicinal oil from West Africa.

**Messrs. W. J. Bragg and Co., Liverpool:**
Three varieties of Jaborandi leaves.

**Professor H. G. Greenish, London:**
Four microscopic slides of podophyllum and two of arnica rhizome.

### *To the Library in Edinburgh.*

**Pharmacy Board of Victoria:**
Report for 1893.

**American Pharmaceutical Association:**
Proceedings, vol. 41, 1893.

**Mr. J. Gower, Ealing:**
Practical Histological Botany, by F. Davis.

**Mr. W. Martindale, London:**
Analyses of 12,000 prescriptions, 1894.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, May 17, Mr. T. Tickle, Vice-President, in the chair. A report on organic chemistry was given by Mr. C. S. Ellis, F.C.S., who summarised recent investigations on the products of the action of diastase on starch, on iridin and its constitution, on Kraff's method of preparing ethers by means of benzene-sulphonic acid, on carbon tetrabromide, the metallic acetylides, and azimides, and on the constitution of camphor. A discussion followed, in which the Chairman, Secretary, Messrs. Hill, Gaul, Henry, and Potter took part.

Mr. E. G. Gaul then read a paper on "Leather, and its Preparation," illustrating it with specimens of tanning materials and skins in different stages of the process, as well as different varieties of the finished product. The paper was followed by a discussion, in which the Chairman, Secretary, Messrs. Hill and Potter joined. The meeting then adjourned.

A meeting was held on Thursday, May 31, Mr. E. Brooke, F.C.S., Vice-President, in the chair. Mr. E. E. Dolbear read some remarks on flowers of the past month, producing a large collection of specimens, and selecting for his observations the bluebell, laburnum, stitchwort, woody nightshade, belladonna, dandelion, teazle, foxglove, herb robert, and bistort. A discussion followed, in which the Chairman, Secretary, Messrs. Tickle, Hill, Potter, and Kitson took part. The following note was then communicated.

### PHOTO-MICROGRAPHY.

BY ARTHUR LANDER.

During recent years, since the introduction of dry plates, the number of amateur photographers has so increased that three years ago it was thought necessary to include the "principles of the ordinary photographic processes" in the Major syllabus, but even now it is greatly to be regretted that pharmacists as a rule do not understand photography, and when an amateur comes to the shop for some chemical, and asks a few questions about its use, he finds that the pharmacist does not keep it, and knows nothing about it; so he is driven to some up-to-date stores, or to a photographic dealer who is not a chemist, and this very frequently leads to a breach of the Pharmacy Act, for most of the chemicals are poisons, and several included in the poison schedule. The sale of photographic requisites is such a profitable one that pharmacists might increase their returns £100 to £200 a year by it.

As every chemist has a microscope (I do not see how he is to pass even the Minor without one), he might well begin on photo-micrography, which is the most simple as well as a most interesting branch of photography.

All the apparatus in the market for this work is so complicated and so expensive, varying in price from £5 to £10 without the microscope, that a description of a very simple apparatus I have designed for my own use might be useful. As seen in the illustration (p. 1054), it consists of a small shallow box, blackened on the inside, and supported on four legs about 2ft. 6in. long. In the bottom of this box a circular hole is cut, into which is nailed a conical sleeve of double thickness of velveteen about 2ft. long, and around the bottom of this a small stout elastic band is sewn. In the top of the box is an opening so made that an ordinary dark slide from a camera just slides firmly into it. If anyone has a ¼ plate camera, a convenient size for this box is eight inches by eight, and three inches deep, with the circular hole about six inches in diameter. If one has not a camera, it is best to buy Tylar's ¼ plate metal double dark slides, which are 2*s*. 9*d*. each, and have the box six inches by six, and three inches deep, with an opening in the top to fit this metal slide, and a hole in the bottom four inches in diameter for the velvet sleeve.

The apparatus is much simpler and far less cumbersome than that introduced by Van Heurck about three years ago, which is also for use with the microscope in the ordinary upright position, but instead of a small box three inches deep to hold the dark slide, and a light velvet sleeve extending to the microscope, his apparatus consists of a box about two feet high from a little above the top of the microscope to some distance above the dark slide, and furnished with a door in the side, so arranged that when focussing, the head is placed inside the box above the focussing screen. Inside this box is also a system of racks one above another, so that if any special magnification is needed this can be obtained by placing the dark slide at different heights. In the apparatus I have described this is done by raising the microscope by placing a book or small box under it. Should the lamp be accidentally moved when using Van Heurck's apparatus it would be necessary to lift off the whole arrangement to again exactly centre the light, but with the above it is only necessary to pull aside the velvet sleeve and replace the eyepiece to allow the eye to be applied direct to the microscope, as in ordinary visual work. There is also a great difference in the price; Van Heurck's in its simplest form is quoted at £4 15*s.*, while the above only cost me 4*s.*

With regard to the microscope, any instrument will do, if it is provided with an Abbé achromatic condenser, for without a condenser the results are very inferior. It is easy to fit this to any instrument, a suitable under-stage only costing 2*s.* 6*d.*, and the condenser so enhances the value of the microscope for ordinary visual work that its addition cannot be too strongly urged; while for high powers, such as a $\frac{1}{12}$th immersion, or even the ordinary dry $\frac{1}{8}$th-inch objective, a condenser of some kind is an absolute necessity, and the Abbé achromatic is far superior to any other, except perhaps those of very high price. With the 1-inch and $\frac{1}{2}$-inch objectives it is necessary to remove the top lens of the condenser to obtain a sufficiently large field.

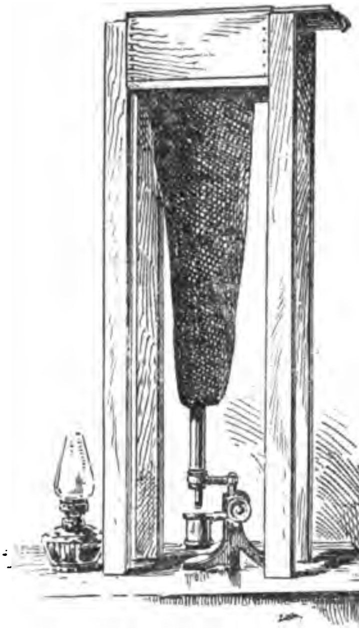

PHOTO-MICROGRAPHIC CAMERA AS ARRANGED FOR USE.

When anyone is using the microscope in the evening in the usual way, placing it upright on a table or bench, and having an ordinary small paraffin lamp with a $\frac{1}{8}$-inch wick about six inches off the plane mirror, and has focussed the condenser, and is examining any object of which he would like a photograph, all he has to do is to take the above stand, and place it on the bench so that the microscope stands exactly in the middle of the four legs, as shown in the illustration. Then remove the eyepiece, pull the velvet sleeve over the brass tube, and the elastic band at the bottom of the sleeve will cause it to fit around the tube so that no light can enter. Focus sharply on the ground glass screen, and when this is done remove the screen, slide on the dark slide, and expose in the usual way. Then lift off the stand, and the microscope is ready for ordinary work without further adjustment.

A better and more accurate method of focussing is to use the field-glass of the eyepiece. Remove the eyeglass and turn the short tube upside down, and with most eyepieces it will be found that any object level, or very slightly beyond the end of the tube, will be just in focus. It is easy to find this out by looking through it at a cross on a piece of oiled paper, and keeping the eye about four inches away from the field-glass. This lens thus makes a splendid focussing glass for ordinary camera work. It is best to focus on a piece of plain glass, so remove the ground glass supplied with Tylar's focussing screen, and use instead of it a piece of plain glass, then slide this into the top of the stand over the microscope, and allow the eyepiece just described to stand on it, field-glass uppermost, then carefully focus by reaching the hand down and moving first the coarse adjustment of the microscope, then the fine adjustment, at the same time keeping the eye a little above the field-glass. The exposure of course varies with the object and objective, but a thin transverse section of quassia wood required $1\frac{1}{2}$ minutes, with the iris diaphragm of the condenser open to a circle $\frac{1}{4}$ inch in diameter, and using a $\frac{1}{4}$-inch *objective*. With the diaphragm fully open, the exposure would have been about two seconds, but the photograph would have been fogged with the flood of light. The best plates, especially for stained objects, are the Ilford instantaneous isochromatic, and the best developer is the following:—

| | |
|---|---|
| No. 1. | |
| Sodium sulphite (free from sulphate and chloride) | 3 ozs. |
| Hot water—to | 16 „ |
| When cold, add | |
| Pyrogallic acid | $\frac{1}{2}$ oz. |
| No. 2. | |
| Sodium carbonate (crystals) | $1\frac{1}{2}$ oz. |
| Potassium carbonate | $\frac{1}{2}$ „ |
| Hot water—to | 16 ozs. |
| No. 3. | |
| Potassium bromide | 40 grs. |
| Water | 5 ozs. |

For normal exposures use one ounce of No. 1, one ounce of No. 2, two drachms of No. 3, and two ounces of water, but if over-exposed use more bromide, while for under exposure the bromide and water may both be omitted.

Hydroquinone gives nearly as good results, and does not stain the fingers.

The object to be photographed must appear perfectly clear when seen in the microscope, and if a section it must only be about one cell thick. There should be a tube of brown paper to screen off the light between the object and the objective, and a lining tube of velvet should be inserted into the body of the microscope to prevent central flare. As we always work with the same light and lenses, exposure is a very simple matter, the only varying element being the objects to be photographed, so that after one or two attempts we need never spoil a plate.

The advantages of this method are evident. The photo is taken with the microscope in the ordinary upright position, so that such objects as pollen tubes or various spores, etc., growing in a drop of syrup can easily be photographed in various stages, which would be impossible in a horizontal position, and also with immersion objectives there is no difficulty in keeping the immersion fluid between the object-glass and the slide. There is no cumbersome arrangement of cameras, etc., to get ready; the photo is taken and developed in ten minutes, thus we have a permanent picture in far less time than it takes to properly mount an object that even when mounted may remain perfect only a few months.

The photos are easily converted to lantern slides by simply printing on Paget's printing-out lantern slides and toning and fixing them in the same way as ordinary prints, and these can be used for illustrations, and thus many weary hours of drawing with the pencil are saved, and a far more truthful picture produced. Professor Greenish informs me that the results obtained by this method and shown to him are so satisfactory, and the arrangement is so simple and efficient, that he is having a similar apparatus made for his own use.

The note was followed by a discussion, to which the Chairman, Messrs. Henry, Maskew, and the Secretary contributed, after which the following paper was read:—

## CAPILLARITY.

BY T. TICKLE.

Capillarity or capillary attraction is the name given to the phenomena observed when one end of a narrow tube open at both ends is dipped into a liquid. It has recently taken up an interesting place in chemistry, its measurement affording indication of the complexity of the molecules of a substance in the liquid state as differing from that when in the state of vapour.

When a capillary tube is immersed in mercury, the liquid stands lower inside the tube than outside, but if the same tube be immersed in water, the liquid will rise within the tube higher than the level of the surface without. This effect is produced by the force of molecular attraction, the forms of it known as cohesion and adhesion being those which influence the action most. The forces cohesion and adhesion are sensible only at distances which are insensible, and are often more powerful than gravitation, as is shown by the globular form of drops of mercury. A drop of mercury would be flat like a sixpence if its molecules were not attracted to each other with a greater force than that by which they are attracted to the earth. Similarly, a drop of water will cling to a glass rod in disobedience to gravity, and a film of it will adhere even after a vigorous shake.

Now, when two forces attract a body in different directions, if the forces be represented each by a straight line, that is, if the lines are drawn in the respective directions of the attracting forces and made proportional in length to their ratio, then the resultant of the two forces will be represented in a similar way by the diagonal of the parallelogram of which the two lines are two adjacent sides, the diagonal being drawn from that angle contained by the two lines in question.

Again, the surface of a liquid must be normal to the force or resultant of forces attracting it. From these two facts, when a glass rod is dipped into water, since the molecules at the surface are attracted horizontally towards the rod and vertically by gravitation, the resultant attraction is in a direction inclined to the rod downwards, and therefore the surface of the water close to the rod will be inclined to it upwards.

*Surface Tension.*—This is a force as the result of which all liquids tend to assume that form in which they possess the least extent of free surface. The surface of a liquid, in fact, behaves like a membrane stretched over the liquid and pressed upon it. This phenomenon also can be traced to the force of cohesion.

Every molecule of a liquid is attracted by all the molecules lying within a certain radius of it. Thus a molecule near the centre of the liquid will be attracted equally in all directions, whereas a molecule at the surface having one half of its sphere of attraction above and the other below the surface will be attracted downwards only. That being so, such molecules possess potential energy, and the greater the number of such molecules in a given liquid—that is to say, the greater the surface—the more will be the potential energy represented. This explains why the effect of surface tension is to minimise the extent of the surface, for it is clear that so far as the surface molecules are free to move towards the centre of the liquid, and so lose their potential energy, they will do so. Thus, olive oil when placed in a solution of alcohol of its own density, whereby it is removed from the influence of gravitation, assumes a perfectly globular form. Water possesses the greatest surface tension of all liquids except mercury, so raindrops are spherical as they fall through the air. This is proved by the rainbow, which is caused by the decomposition of sunlight into its prismatic colours as it passes through the drops.

If a needle be carefully placed on the surface of water so that it is not wetted it will float. This is an effect of surface tension. The needle being coated with a thin layer of fat does not touch the water, but rests on a cushion of air in a depression of the surface, the tension of which acts in opposition to the weight of the needle.

The tension of the surface of one liquid in contact with another is less than it is in contact with air. Thus, when a drop of oil is placed upon water, the united surface tensions of the oil and water in contact with the oil may be less than that of the free surface of water. If they be not less, the drop of oil will remain lens-shaped, but if less, it will be stretched by the greater tension of the water till it is but a very thin film. The action may be compared to stretching a strip of india-rubber which has a thin place in the middle. The stretch takes place only where the rubber is thin.

A drop of train oil thrown upon the sea will be drawn into so thin a film that the colours reflected after descending in Newton's scale at last disappear, showing that the thickness of the film must be considerably less than half the wave-lengths of light, which are from ·0004 to ·0006 of a millimetre. And even then the film can be proved to be present, for the tension of the surface is less than that of the free surface of the water. This is shown by placing another drop on the surface, which will be seen not to spread out like the first, but to remain lens-shaped.

Since the surface tension exerts pressure in a direction perpendicular to the surface, in a capillary tube therefore where the meniscus is concave, the pressure is inclined towards the sides of the tube, and hence is not so great perpendicularly as that due to the tension of the level surface outside the tube. Thus it is that the liquid rises in the tube till equilibrium is produced between the greater surface tension without and the weight of the column within the tube.

The height to which a liquid rises in a capillary tube is inversely proportional to the diameter of the tube. The shape of the tube does not influence the action. As long as the bore is the same at any given height in two tubes of varying diameter, a liquid rising to this height in one will rise to the same height in the other. Since capillary action depends upon surface tension, a definite relation exists between them, and hence surface tensions can be estimated from measurements of capillarity.

Surface-tension diminishes with increase of temperature, vanishing altogether at the critical temperature, and Professor Ramsay has found that an analogy exists between the variation of the volume of a gas with absolute temperature and the variation of the surface-tension of a liquid with the temperature measured downwards from the critical temperature.

Now, the product of the volume and pressure of a gas is equal to absolute temperature multiplied by a certain factor which has a constant value for all gases if, as unit of volume, the volume of the molecular weight in grammes be taken. And if the true molecular weight of the gas be half the supposed number, the necessary factor for the temperature to complete the equation would be double the usual. In this way, therefore, the molecular weight of a gas or vapour can be checked without taking its vapour density. This has led Professor Ramsay to the theory that the molecular weights of substances in the liquid state can be checked in a similar way through their surface tensions. He has found by experiment that carbon bisulphide, phosphorus trichloride, and such compounds give numbers corresponding with their molecular weights as found by their vapour densities. But other substances, such as alcohols and acids of the paraffin series, appear to associate in condensing to liquids into groups of two or more molecules.

Liquid water, if the theory can be trusted, contains the molecules in groups of about four at common temperatures, and it is noteworthy that this is not the first time water has been suspected of associating into groups of molecules.

From the relation of surface tension to the critical temperatures of liquids it is possible to calculate the latter also from the surface tension, and the results obtained by Professor Ramsay upon a number of liquids correspond closely with the figures actually observed.

A discussion followed, in which the Chairman, Secretary, Messrs. Hill and Potter joined.

The meeting then adjourned.

## ROYAL MICROSCOPICAL SOCIETY.

At the meeting on May 16, Mr. A. D. Michael, F.L.S., President, in the chair, Mr. C. Lees Curties exhibited and described a microscope which had been specially made for photographic purposes. The leading feature of the instrument is that the nose-piece is removable, so that an ordinary photographic lens can be substituted for the objective if required. He also exhibited a new form of apparatus for obtaining instantaneous photographs of objects under the microscope; as examples of what could be done with this apparatus he showed photomicrographs of blood-corpuscles taken with powers × 300 and 600 diameters, and also some low power photos of living specimens of *Lophopus*, with tentacles extended. Dr. W. H. Dallinger thought the photomicrographs were extremely good. He noted in the immediate vicinity of the *Lophopus* there were some *Vorticellæ*, and this suggested that it might be possible to take them in the act of closing, so as to get an idea how the movement was performed. Mr. Shrubsole said he had brought to the meeting a few living specimens of *Gromia*, which were shown under one of the microscopes on the table. One peculiarity of these specimens was that instead of possessing but one aperture, there was a zone of small apertures round a central one; this, he thought, was a good reason why this object should be removed from the Monostomia. After describing a naked rhizopod closely allied to *Lieberkuhnia*, and an organism resembling *Shepheardella*, Mr. Shrubsole said he had on the previous day obtained from the water off Sheerness some masses of a dirty-looking substance containing all sorts of forms of gelatinous objects, in which were imbedded a number of granules; they were the cause of what the fishermen called "foul water," or "May water." They were only seen for certain seasons, and for a short time, and it would be an interesting inquiry to find out what became of them. Professor F. Jeffrey Bell said that he had just been present at the annual inspection of the Marine Biological Laboratory at Plymouth, and he found that one of the greatest troubles there had been the condition of the water. Only two fish had died during the last twelve months, but the Director was desirous of obtaining information as to the Diatomaceous and Desmidaceous condition of the water in the tank. Inquiries naturally suggesting themselves would be what the organisms really were which caused this "foul water." Was the "foul water" due to their presence, and were they a great number of larvæ undergoing transformation? Professor Bell called attention to the three frames of photomicrographs which formed the Society's exhibit at the Chicago Exhibition, and which had just been returned. The Fellows would have now the opportunity of seeing them, and determining whether they were worthy of the medal which they were told had been awarded the Society.

## QUEKETT MICROSCOPICAL CLUB.

At the meeting on May 18, Mr. A. D. Michael, President R.M.S., in the chair, Mr. C. L. Curties exhibited a new instantaneous photomicrographic apparatus, and explained the method of using it. Some excellent pictures of pond-life, fresh human blood, etc., taken by this apparatus were handed round for inspection, and one group of *Lophopus* fully extended, surrounded by *Vorticellæ*, was particularly admirable and life-like. The Chairman thought this apparatus would be especially valuable for obtaining representations of quickly moving organisms, which were almost impossible to draw in a natural way because of their rapid evolutions, and they might get composite pictures which would throw some light on this difficult subject of locomotion in minute animals, such as had been done by Muybridge and others with the horse, for instance. Mr. G. Western read some interesting notes on foreign rotifers which had since been found in Britain, amongst them being *Notholca heptodon*, *Bipalpus vesiculosus*, *Chromogaster testudo*, *Æcistes mucicola* and *Æ. socialis*, *Brachionus dorcas*, and others, which were accompanied by beautifully executed drawings by Mr. Dixon Nuttall. Mr. Western pointed out the uncertainty and variability of many of the characters relied upon for specific, and in some cases for generic, value, such as the presence or absence of setæ, antennal appendages, or even of the eyes. Mr. Michael said, with regard to the eye, he had frequently found the same peculiarity among the Hydrachnea or water-mites; in the same gathering would perhaps be met with specimens otherwise identical, some with and some without eyes, or the eye present on one side only. The pigment greatly varied in amount, or was entirely wanting, but without sections it was difficult to say whether that was the case with the true nervous part of the visual organ, which from its transparency was easily overlooked in merely surface views.

# Provincial Transactions.

## THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

A meeting of the junior section of the above Association was held at the Foresters' Hall, Plymouth, on Thursday, May 24. Mr. E. A. Hodge was voted to the chair. After the usual business an instructive paper, entitled "Jottings from the Dispensing Counter," was read by Mr. F. A. Goodman. A hearty discussion followed, in which Messrs. Hodge, West, Green, Newman, and Westcott took part, at the close of which a vote of thanks, proposed by Mr. Westcott and seconded by Mr. Newman, was unanimously carried.

## MIDLAND PHARMACEUTICAL ASSOCIATION.

### ANNUAL GENERAL MEETING.

The annual general meeting of the members of the Association was held at the Mason Science College, Birmingham, on Thursday, May 31. Mr. C. Th (President) occupied the chair.

The report and balance sheet were taken as read.

In the report, after reviewing the work of the session, the Council pointed out that the Educational Committee had not been able to report any definite scheme for the education of the younger members at présent, but hoped that satisfactory arrangements would be made later on. The Recreation Section had held the usual Wednesday afternoon meetings, and the balance sheet showed a balance in hand of £1 3*s.* Owing to several of the active members having left the town, and to so little interest being shown at a preliminary meeting, it had been decided not to engage any special ground for this season. Arrangements, however, would be made for the Married *v.* Single cricket matches, due notice of which would be given. The annual ball proved, as in former years, very enjoyable to those who were present. Unfortunately, however, a large number of stewards who had actively supported the gatherings in the past were prevented from various causes from being present, the number of persons at the ball being thereby considerably lessened. A deficit of £10 13*s.* was the result, and the Council hoped that some of the members would assist the Ball Committee in clearing off this deficit by donations. It was gratifying to find that the calls on the Benevolent Fund had been very small during the year. The annual supper was held at the Colonnade Hotel, on May 18, 1893. It was well attended, and a very enjoyable evening was spent. The Library had been freely used by members during the past year; there is naturally, however, a demand for new books, and the Council hoped that additions might be made during the coming session. The financial statement showed a deficit of £3 5*s.* 8*d.*

The Chairman moved the adoption of the report and statement of accounts, and in doing so said that he could not allow that opportunity to pass without thanking the members generally, and the members of the Council specially, for the sincere tokens of friendship they had shown him during his two years of office. Their Association, he was glad to say, was still flourishing. It was not so satisfactory financially as it had been in past years, owing to some heavy expenses which could not be prevented, but numerically it was as strong as ever, and thoroughly united in all the various departments. The meetings of the year had not been so well attended as they ought to have been, considering they had had good papers and profitable discussions, and in order to remedy that he would urge upon the incoming Council the advisability of trying afternoon meetings instead of evening meetings. The education of the young members was not being lost sight of by the Council. Negotiations were proceeding with existing institutions for classes, which would be of great value to the young pharmacist. In regard to the foreign policy in which they had been engaged, they would remember that two years ago they were good enough to listen to an address from him on territorial representation, and he might say, in passing, that letters had been received endorsing the views then expressed, and although the subject was apparently dormant, it was gradually taking hold, and would eventually have its effect. Some change was required to remedy the old-fashioned way in which the Pharmaceutical Council was elected. It was time that some change took place when the innocent Pharmacy Bill introduced to Parliament could not find sufficient support to obtain its sanction. The haphazard and slipshod way in which candidates were proposed for election was, in his opinion, a disgrace to the end of the nineteenth century, and ought to receive the attention of those who had the welfare of the Society at large at heart. With regard to the federation of local pharmaceutical associations, they would remember they had a well attended meeting at Nottingham last year, and a sub-committee, consisting of Messrs. Cross, Parry, Kemp, and himself, was appointed to consider the subject. As the result of deliberations, a circular was sent to all local associations, asking them to appoint a delegate. Most of the leading associations had replied, and there was to be a meeting at Oxford at the time the Conference met. At that meeting officers would be appointed, and subjects of interest to the trade would be brought forward for discussion. Numerous inquiries had been made as to what they intended to do, and without giving details he thought he could safely say that they would do nothing rash, or anything they would be ashamed of. On the contrary, their object was to bind the associations closer together, so that when any question arose affecting the trade interest there would be an organisation ready to discuss the same, and if necessary to make arrangements to hold meetings all over the country, and so protect their interests when they were threatened. Their object was union, and as to the exact subjects to be discussed he thought that was a matter which in common fairness should be left to the delegates. The only thing in the balance sheet calling for special notice was the deficit of £3 5*s.* 8*d.* That did look a little bad, but it was a deficit on the ball account. He thought, however, it would be wiped off in the course of the next twelve months.

Mr. A. Southall seconded the motion, and said that perhaps the report was as good as they could expect, seeing they were chemists. In Bloomsbury Square, as well as in Birmingham, they had talked of improvements that were much needed, but the Irish Home Rule Bill still stood in their way. They had great difficulty in even passing a little bit of a bill they had attempted this year, and he was afraid they would not get it through. Their chemist and druggist members were not satisfied unless they had full representation on the Council, and turned off all pharmaceutical chemists. As pharmaceutical chemists they could not give up all their rights and powers and endeavour to stop the work they had, and stop the association that had worked well, he believed, so far. He was sorry to know that during the year their young people had not come up so well as they ought; they were the people who ought to support the evening lectures. He suggested that those who danced, and called that pharmacy, should get the subscriptions among themselves, and pay off the adverse balance.

Mr. W. Jones regretted there was a deficiency, and considered it was brought about by the change from the Town Hall to the Edgbaston Assembly Rooms. In years gone by the balls had been the means of supplying funds for the objects for which the Association was formed.

Mr. F. H. Alcock thought it was very desirable they should adopt some system of making their meetings more attractive. It was a most miserable sight to see half a dozen men talking on serious subjects, when they ought to hav[illegible] hundred or so to the series of post-graduate lectures. It was a great pity, but they seemed to spend a great deal of money and got very little result. He felt the ball ought to be discontinued for a year or two at least.

Mr. Dewson considered it would be a great pity if the ball was given up altogether.

Mr. Gibson said that in his district he had ofte
been asked what was the benefit of belonging to ty
Association. He thought that if it could be annou
at the commencement of the year what the le
would be, that it would be a good means of s por-
wider interest. pitated

The Chairman said that he could not orrected,
Alcock meant all he said. Those who kne n circum-
take a considerable amount off his criticis e erroneous
the remarks he had made appeared host
now omitted

had the welfare of the Association at heart, and he did not mean anything harmful. Of course, he knew it was most difficult to get the members to attend the evening meetings, and if he could suggest the means of improving the attendances the Council would be extremely obliged if he would do so. With regard to what they got for the 2*s*. 6*d*. subscription, Mr. Alcock knew that the half-crown did not cover the expenses which they were put to. With regard to the smoking concerts, he (Mr. Thompson) believed they were the means of bringing the members together. Respecting the ball, it was true that the last one showed a deficit, but the annual ball had in the past been a very acceptable source of income. They had had as much as £33 in a year as surplus from the ball account. In reply to Mr. Gibson, he might say that at the beginning of the session they issued programmes fixing the nights, and as far as possible they named the lectures and lecturers.

The report was then approved.

Messrs. Prosser and Gibson, the scrutineers, handed in the results of the voting, which showed that the Council was re-elected, with the substitution of Mr. J. Barclay for Mr. C. J. Arblaster.

On the motion of Mr. Brunt, seconded by Mr. W. Southall, a vote of thanks was passed to the President and members of the Council for their services during the past year.

Mr. Thompson briefly replied, and the members then adjourned to the Midland Hotel, where the annual supper was served.

ANNUAL SUPPER.

Mr. C. Thompson presided, and was supported by Messrs. W. Jones and R. D. Gibbs, Vice-Presidents; F. H. Prosser, Assistant Local Secretary; F. J. Gibson, Local Secretary for Wolverhampton; W. R. Selleck, Local Secretary for Stourbridge; G. E. Perry, Librarian, and others.

The toast of "The Queen" having been duly honoured, Mr. G. E. Perry proposed the toast of "The Pharmaceutical Society." He said it was not the first time he had had the pleasure of proposing this toast, and that he was pleased to see that it was received with more enthusiasm now than ever, he concluded by urging those who had not yet nailed their flag to the mast of the good ship—the Pharmaceutical Society—to do so at once, as it was the only source to which they could look to for assistance to remedy any grievance to which they, as pharmacists, were subjected.

Mr. C. Thompson, in replying, said he thanked them for the enthusiastic way in which they had received this toast. It was very gratifying to him, as their local secretary, and to his colleague, Mr. Prosser, to find that the Pharmaceutical Society was fast becoming a more popular body with the trade than it had been in the past. Birmingham and district had been the centre of Radical thought and action in the past, and while the Midland Pharmaceutical Association was perhaps advanced in its views, in pharmaceutical politics they were like their city, "Unionist" to the backbone. In the course of further remarks he said that, from his own knowledge, in the Midlands the Pharmaceutical Council was doing its utmost to cause respect to be paid the various Acts of Parliament under which they were governed, and if they wanted further proof of the desire of the present Council to do what it could for the protection of the public and the benefit of the craft, he would strongly urge them to read the remarks of their worthy President, Michael Carteighe, at the annual meeting of the Society, which were printed in the *Pharmaceutical Journal*.

Mr. F. J. Gibson, local secretary, Wolverhampton, also replied, and said he agreed with what had been said by the last speakers, and although there was still a large amount of indifference, he was glad to find a marked improvement in his own district.

The toast of "The Midland Pharmaceutical Asso tion" was then proposed by Mr. F. H. Alcock, to wh Mr. R. D. Gibbs, vice-president, ably replied, a afterwards, the health of the president was dru with much enthusiasm.

During the evening the following gentlem assisted in the musical programme:—The President, Messrs. Cartwright, Homer, Burton, Perry, Scott, Moles, Wilkes, Chapman (Liverpool) and others.

The officers of the Association for the ensuing year will be appointed at a council meeting to be held "within thirty days of the annual meeting."

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## NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

The annual meeting of this Association was held at the Masonic Hall on Wednesday, May 30, when there was a good attendance of members, and, in the unavoidable absence of the President (Mr. Councillor Fitzhugh, J.P.), the chair was occupied by Mr. Bolton. The annual report showed that the numerical strength of the Association had practically remained altered, but the apathy of members to the best interests of the trade was deplored. An interim report from Professor Clowes respecting the result of examinations held at the College was also read, showing the prize for pharmaceutical chemistry was won by Mr. A. J. Orme, while Mr. W. Calvert passed with distinction; at the materia medica examination, Mr. C. Massey was prizeman, and Messrs. A. J. Orme, A. Wood, and F. Whitworth passed with distinction. The physics and organic chemistry classes being still in session, no report was forthcoming. The Treasurer's report showed that the financial position of the Association was satisfactory. The election of officers for the ensuing year resulted as follows:—President, Mr. Councillor Fitzhugh, J.P.; Vice-President, Mr. C. A. Bolton; Treasurer, Mr. J. Wilford; Hon. Secretary, Mr. W. Gill; Council, Messrs. Bailey, Beverley, Dennis, Eberlin, Mason, Middleton, Parker and Sergeant. Votes of thanks were passed to the Council of the Pharmaceutical Society for the *Pharmaceutical Journal* and 'Calendar,' and to the Briti Pharmaceutical Conference for the 'Year-Book Pharmacy.' A very cordial vote of thanks was pa to the retiring vice-president, Mr. W. H. Parker, had devotedly served the Association in va capacities since its formation. A similar compli was paid to the officers for their services in the year, and to the Chairman for presiding.

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# Parliamentary and Law Proceedin

## PROCEEDINGS UNDER THE SALE FOOD AND DRUGS ACT

### DEFECTIVE TINCTURE OF IODINE.

At the Birmingham Police Court, on June 1, be Messrs. Warden and Edward, Cornelius Bayley, mist and druggist, 40, Bristol Street, was summ for selling tincture of iodine which did not co the component proportions prescribed by the Br Pharmacopœia. Mr. Porter (Messrs. Glaisyer Porter) defended, and admitted that a tech offence had been committed, but it had arisen th the stupidity of one of defendant's servants. called defendant and an assistant, who stated the tincture of iodine contained the drugs in th portions prescribed, but the solution was inco when the article was sold, and the assistant lected to shake the bottle. A fine of £2 and was imposed.—*Birmingham Mail.*

## PROCEEDINGS UNDER THE PHARMACY ACTS.

### PROSECUTION OF CHEMISTS UNDER SECTION 17 OF THE PHARMACY ACT, 1868, AT OLDHAM.

At the Oldham Police Court, on Thursday, the magistrates' decision was given in the cases initiated by the Patent Medicine Vendors' Defence Association, Limited, which were reported last week (see page 1041).

The Chairman said: With regard to the sale of Fellows' syrup, the case of the Pharmaceutical Society *v.* Piper and Co. makes it quite clear, although the case was decided under the 15th section, that the restrictions contained in the 17th section, with which we are dealing, are not confined to the sale of scheduled poisons in a simple state, or of preparations of such poisons, but are extended to the sale of compounds containing scheduled poison as an ingredient. The case of the Pharmaceutical Society *v.* Armson confirms this decision, and must be regarded as over-ruling the views of Justice Lush. In Berry *v.* Henderson, Justice Lush, interpreting section 17, said, "I observe the schedule seems to treat all poisons as sold in their simple state, or in some form of preparation alone, it does not appear to contemplate any of them being mixed in other ingredients." The case of the Pharmaceutical Society *v.* Delve decides that if the quantity of the poisonous ingredient is so small as not to be destructive or seriously injurious to life, the seller is not liable under the Act. The analyst shows that Fellows' syrup contains in four ounces sufficient strychnine to destroy human life. So it follows that the syrup comes within the scope of the Act, and persons selling must comply with the requirements. As the object of the body which the complainant represents is simply to establish whether the defendants have infringed the Act, it is unnecessary to inflict more than a small penalty of 20*s.* and costs in one case against each defendant; the rest of the syrup cases will be dismissed. There are grave doubts as to whether the defendants are liable to be convicted of three offences for one sale. We are advised that the fly-paper cases do not come within the scope of the Pharmacy Act, and we dismiss the summons against Whittingham.

Mr. Sixsmith applied for a case to be stated for a higher court as regards the summons dismissed, and this was granted, the other fly-paper cases being adjourned pending the decision of the Court of Queen's Bench.

## Reviews and Notices of Books.

COMPANION TO THE LATEST EDITION OF THE BRITISH PHARMACOPŒIA. By PETER SQUIRE. Sixteenth Edition. Revised by PETER WYATT SQUIRE and ALFRED HERBERT SQUIRE. Pp. i.-xl., 1 to 693. 12*s.* 6*d.* (London: J. and A. Churchill).

This work has been so long recognised as a useful and trustworthy source of information in regard to practical pharmacy, and, as a book of reference, it has been so extensively adopted as an indispensable adjunct of every pharmaceutical establishment, that a review of it in the ordinary sense is out of the question. Its excellences and defects have, moreover, been so frequently commented upon in these pages, that in a general way there is nothing further to be said of it in those respects. In the numerous editions through which the book has passed, the characteristics which make it useful have been well maintained by the addition of new matter, representing advanced knowledge and improved practice. Those features which we have regarded as blemishes in such a work have also been retained, so that in each succeeding edition it has been mainly the additional matter which has called for notice, and the chief point for consideration has been the sufficiency with which progress in the pharmaceutic art has been represented. That is the case on the present occasion. As representing the actual condition of pharmaceutical practice in the United Kingdom, the work has, however, long since far outgrown the latest edition of the Pharmacopœia, to which it was originally intended to serve as a companion, and, as containing a store of valuable information, it may now be regarded as in many respects anticipating the next issue of that authority.

The present edition gives evidence of a great advance upon the previous one on almost every page, and it embodies the results of a large amount of original work collected from pharmaceutical and medical journals. In many instances the data have been verified by the authors, and throughout the book great care has evidently been bestowed upon the revision of its contents.

The data relating to solubilities are very useful, and the remarks as to improvements of processes are of great practical value, as, for instance, those relating to the preparation of sulphurous acid with the compressed gas, and of mercurial oleate, by rubbing the oxide with ether and then mixing it with the oleic acid. The remark that coconut stearine is a good base for suppositories should stimulate some pharmacist to study this fat in regard to its further possible application. It is pleasing also to find that British pharmacy at last rises to the knowledge that creosote will coagulate albumin.

In connection with eucalyptus oil, it would be well for those who suggest that the value of the oil is to be gauged by the amount of eucalyptol it contains to bear in mind the reminder that the reputation of the oil was gained by oil as to which there is no conclusive evidence that it contained any notable amount of crystallisable eucalyptol.

Whenever opportunity offers the authors make their work not only the companion, but also the candid friend of the Pharmacopœia by exposing errors. Thus, at page 177, attention is drawn to the precipitate produced in cocaine hydrochloride by ammonium carbonate being insoluble in an excess of the precipitate; at page 290, in reference to an apparent slip in the official test for bromine, it is suggested that the solution should be shaken with chloroform after adding chloride and not before. In the official directions for determining the amount of water in *Adeps lanæ hydrosus* no mention is made of stirring the fat, but without this the 'Companion' says the drying process is incomplete after ten hours' exposure on a water-bath, though with constant stirring at a temperature of 130° C. the dehydration is complete within twenty minutes.

The statement in the Pharmacopœia that the portion of tragacanth soluble in water is not precipitated by the addition of rectified spirit is rightly corrected, and precipitation is shown to depend upon circumstances. The statement was shown to be erroneous by the late Professor Maisch, and as it is now omitted in reprints of the Pharmacopœia, that fact might have been mentioned.

The criticism of the statement in the Pharmacopœia that a decoction of cinnamon, when cool, is not coloured by iodine is well timed, but it is incorrect to say that the disappearance of the blue colour is due to absorption of the iodine by the essential oil. The oil is one of the interfering agents, but the principal one has yet to be discovered. In 'Pharmacographia' it is pointed out that bark which has been treated with alcohol and boiling ether still retains a substance which interferes with the iodine reaction for starch.

Under *Liquor ammoniæ citratis fortior* excellent directions are given to dissolve the acid in water and filter to separate the particles of lead frequently present in commercial citric acid before neutralising with the alkali. Moreover, this method is more expeditious than the official one, which is tedious, owing to the liability of the citrate to crystallise out. The Pharmacopœia, however, does not recognise citric acid that is contaminated with lead.

All who have frequent occasion to make *Liquor calcis saccharatus* will heartily endorse the statement that it is better to dissolve the sugar in water before adding the calcium hydrate than to follow the Pharmacopœia directions, and it is to be hoped that method will be adopted in the new issue of the Pharmacopœia.

If Boa's theory respecting the stirring of ointments be correct, the note under *Ung. simplex*, that "the ointment is apt to granulate if the stirring is not continued until it solidifies," will have to read "If stirred, the ointment is apt to granulate."

According to the 'Companion,' the changes made in the B.P. 1885 in the process for making *Acid. nitro-hydroch. dil.* and *Liq. ammon. acet.* do not compare favourably with the directions given in the Pharmacopœia of 1867. In reference to the more recent process for making the former preparation, it is stated that little free chlorine or nitrous acid is formed. The latter preparation is stated to be almost entirely destitute of carbonic acid. As the change in the preparation of diluted nitro-hydrochloric acid is understood to have been made with the intention of ensuring the retention of the chlorine, it is to be hoped that some worker will take this subject in hand before the appearance of a new pharmacopœia. In "mindererus spirit," which is made from a concentrated liquor, it is not to be expected that there will be any appreciable quantity of carbonic acid, but the introduction of *Liq. ammon. acet. fort.*, as well as the *Liq. am. citratis fort.* is, however, of doubtful advantage.

The possible mistake of officially introducing paraffin as an ointment basis without sufficient previous trial, is shown by the statement that on keeping carbolic acid ointment, part of the carbolic acid crystallises out. It is a suggestive fact that though America is the home of the soft paraffins, they are not used in any ointment official in the U.S.P. Such crystallisation would not occur with the animal fats or vegetable oils.

Few statements as to which any doubt existed have been adopted without careful examination. This is well exemplified at page 262, where the tendency of Easton's syrup to crystallise is discussed, and at page 99, where the conflicting statements as to the solubility of apomorphine hydrochloride are explained. But there are a few instances in which objection may be taken to the statements made.

The gradual evolution of carbonic acid taking place when bismuth subnitrate is mixed with a solution of sodium bicarbonate is attributed to the former salt parting with its acid in the presence of water; but if that were the cause, the same effect should be produced with sodium carbonate, which is not the case. It is more probable that the decomposition is due to the slight solubility of the bismuth salt in water, and to a reaction giving rise to bismuth carbonate and sodium nitrate, with liberation of carbonic acid in the one case, but not in the other. The recommendation of tragacanth as a suspending agent for bismuth salts will be questioned by many pharmacists. It is certainly better than acacia, but many consider syrup and glycerin better than either.

Under iodine it is suggested that the use of potassium iodide to increase the solubility in spirit is unnecessary. That is true in regard to the official tincture, as the proportion of spirit is sufficient to dissolve the iodine. The presence of the salt, however, checks precipitation of iodine on dilution, and the liniment could not be made of the strength ordered (1 in 9) without the use of iodide.

The statement that the short-leaved buchu (*betulina*) is now the only one obtainable commercially is not quite correct. At page 300 it is stated that potash does not cause a precipitate in a glycerin solution of mercuric chloride, but that is not the case even with very dilute solutions, and the solubility of the salt in glycerin is very much less than it is stated to be, viz., 2 in 3. *Glycerinum Tragacanthæ*, B.P., is objected to as a pill excipient, and a preparation, consisting of tragacanth powder with six parts of glycerin, is recommended as preferable, but pills made with it are liable to show a damp surface when ex- posed to the air, owing to the tendency of glycerin to absorb water. "Diluted alcohol" is recommended a menstruum for *Ext. Tritici Liquidum*, without indication of strength. In the notes on tinctures stated that in the case of *Tinct. Card. Co.* the mate should be rubbed together in a mortar and packed the percolator without spirit, while with myrrh p colation is impossible without previous macerati This statement, however, might almost be inve Objection may be taken to the latinising of sal "salolum," and of resorcine as "resorcinum," as as its chemical name as "metadioxybenzolum," to the retention of the nitro-substitution formula pyroxylin.

The statements in regard to certain preparations they have now been made official, and that they had a place in the 'Companion' for years, occur rath frequently. The laudation of certain propriety cles, the formulæ of which are not given, migh have been omitted in such a work, and the tion of a "Mouth and Nose Protector," 280, would have found more appropriate the advertising columns of a trade he reference to "Our Essence of Ginger," at p. 547, also out of place. In some instances notes elating to various drugs, etc., would have been more uitably published in a pharmaceutical journal immeiately after the papers referred to appeared. Thus, r instance, an error in Fuge's paper on the testing of *errum Redactum* is pointed out at page 265, and iebold's recommendation to use unfermented logwood r medicinal purposes is called in question at page 87.

As the 'Companion' can well claim to be an authori- tive compilation of useful data, any introduction of ontroversial matter is to be deprecated. That is the se in the references to Fehling's and Pavy's solutions page 222, where, in speaking of and describing their lative merits, an opinion expressed on that point as criticism," the sarcastic introduction of a note of ad- iration after this word does not harmonise with the neral character of the work. It may here be men- oned that in accordance with a common practice of harmaceutical writers the quantitative analytical eration by which the amount of a substance is as- rtained is frequently spoken of as "estimation" stead of using the word "determination," which nveys a more precise and appropriate idea of the ject to be attained. It is true the British Pharma- pœia furnishes a precedent for the use of the more definite term, but that is one of the points in which provement may be looked for in the future revision.

The authors are generally particular in giving ori- al sources of information, but the statement that official formula for *Tinctura hamamelidis* is the ne as B.P.C. 1889 and 'Companion' 1877 might e been replaced by a reference to the Homœopathic armacopœia of a still earlier date than either of the rces mentioned. The formula for Coster's paste is rred to the Pharmacopœia of the British Hospital Diseases of the Skin, and that for *Pasta amyli iodidi* the Hospital for Children, but both formulæ were lished years before in the Pharmacopœia of Univer- College Hospital. The formula for oil for catheters nd's oil modified) is attributed to University College pital, though it was never published in the pharma- œia of that hospital. Under carbolic antiseptic sings the proportion for lac plasters is given as per cent. No mention, however, is made of the nula published by Martindale (after Sir J. Lister), which the proportion was 25 per cent. (*Pharm. rn.*, [2], x., 391), though it appeared in the editions 13 of the 'Companion,' and was referred to niversity College." These references are of no insic importance, but for other reasons it is desir- that they should be accurate. Under salicylic sings, 33⅓ per cent. is stated to be the proportion lac plasters, but that is far too much to be kable, and it is questionable whether the prepara- would be of any use if made.

the preface it is stated that comparative experi- ts have been made with pill excipients, but to omise space the best one for each substance has included. That is not always the case; for car- acid pills two excipients are given, but none for cinnamon, and none are mentioned for many other substances often given in pills, such as scammony and its resin, squill, ipecacuanha, Dover's powder, agaricin, quinine, hydrochloride, ammoniacum, galbanum, aloes, aloin, chrysarobin, gamboge, lupulin, etc.

The B.P.C. formula for *Chloroformum belladonnæ* is freely criticised, but that for *Chloroformum aconiti*, B.P.C., is not mentioned. The well-known formula of the late Sir Erasmus Wilson for hair lotion is given as *Lotio crinalis*, without mention of his name.

The large additions which have been made to the 'Companion' have considerably increased the size of the volume, though not bringing it to the stupendous proportions of either the 'National Dispensatory' or the other work which occupies in the United States the place of the 'Companion,' and includes matter of a more educational character. It may, however, be desirable in future editions of the 'Companion' to economise space by omitting the abbreviated descriptions of methods of preparation by which alkaloids and some other well-defined substances are obtained. Such descriptions have but little practical value, and the space they occupy may in most instances be more usefully devoted to purposes of definition and identification. The pharmacist's requirements in regard to these two points are continually increasing, and it is in such a work as the 'Companion' that information of that nature may be naturally looked for.

The book is remarkably free from typographical errors. At page 420 the word "dehydrated" requires correction. At the foot of page 128 "Benzoinæ" should be "Benzoini," at page 479 "off" should read "of," and at page 322 "deematised" should be "deemetinised."

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LAW AND THEORY IN CHEMISTRY: A COMPANION BOOK FOR STUDENTS. By DOUGLAS CARNEGIE, M.A. Pp. i.-vi., 1 to 222. 6*s*. (Longmans, London)

In the preface to this work the hope is expressed "that it may be found useful by such students as wish to recapitulate and co-ordinate the more important principles of chemistry before proceeding to more detailed and advanced works." There is no reason to doubt that the desired purpose will be well served by the book, nor that the author's further intention of exciting rather than satisfying interest will not be frustrated, for he treats a most fascinating subject in an equally intelligent and attractive manner. There are seven chapters or essays, the first being devoted to alchemy and the birth of scientific chemistry. In this the views of Thales, Pythagoras, Empedocles, Aristotle, and Geber are ably and briefly summarised, as well as those of Valentine, Paracelsus, and other workers down to the time of Boyle, who upheld the modern view of elements, and by his work marks "the transition from the vague and uncurbed fantasies of alchemy into the true science of chemistry." The phlogistic period and the beginnings of chemical theory next receive attention, Becher and Stahl's theory of combustion, and the growth of knowledge of the atmosphere at the hands of Hooke, Mayow, Black, Priestley, Cavendish, and Lavoisier, being described. Under the heading of chemical classification, the laws of Dalton, Henry, Graham, and Boyle are discussed; fractional distillation, atmolysis, dialysis, refrigeration, and other methods of separating the different components of mixtures are referred to; and the chapter is concluded by brief statements of the views of Mendeléeff and Crookes. The remaining chapters, which occupy the greater part of the book, deal with the atomic theory, the classification of compounds, isomerism and molecular architecture, and chemical equilibrium. In these, the conflicting views concerning the constitution of matter, as held by Leukippos, Lucretius, Newton, Dalton, Gay-Lussac, Humboldt, Berzelius, Avogadro, and the numerous other and later workers in this field, are contrasted and compared; acids, bases, salts and indifferent bodies are discussed; the work of van't Hoff and Le Bel, Wislecenus, Guye and Anschütz is clearly explained by the aid of numerous diagrams; and in the last chapter, one of the most important in the book, the consideration of the investigation of equilibria serves to illustrate the importance of the application of physics and mathematics to chemistry, the chapter as a whole constituting a much needed introduction to the study of chemical equilibrium. Altogether, this attempt to keep so much information up to date in so small a volume may be considered as highly successful; and though, as may well be imagined, not adapted for beginners, the book will be found a sound and extremely useful "companion book" to all students fairly advanced in chemical knowledge. The main defect in the book, and indeed the only one worth mentioning here, is the omission of an index.

THE MEDICAL ANNUAL FOR 1894. Pp. i.-lxiv., 1 to 672. 7*s.* 6*d.* (John Wright and Co., Bristol).

The publishers of this admirable and useful work seem to have been more anxious than ever to maintain its high character. The book is not a mere epitome of new drugs, new inventions, or modifications in treatment which have been advocated during the last twelve months, but contains some original articles, which serve to take it out of the domain of mere year-books. There is a valuable and beautifully illustrated contribution by Dr. James Shaw, on facial expression as one of the means of diagnosis and prognosis in mental disease, which demands attentive study from all members of the profession interested in insanity. It is doubtful whether the alphabetical arrangement adopted in this book is a wise one. A more suitable method would be to collect all the new facts in medicine and surgery under the different sections into which they most naturally fall. For instance, it is troublesome to look for information on midwifery or gynæcology under the headings of uterus, ovaritis, pregnancy, etc., when the facts could have been brought into one section, in the same admirable way that new remedies are set forth. The book is of great value to practitioners and dispensers.

DOMESTIC HYGIENE. By THOMAS DUTTON, M.D. Pp. i.-x., 1 to 199. 2*s.* (Henry Kimpton and Hirschfeld Bros., London.)

Dr. Dutton has performed a useful service in collecting his journalistic contributions into book form. We have before had occasion to refer to the aptitude he possesses of reducing dry technical literatu
simple language, so that it may be intelligible t
householder who, in spite of himself, is bound t
an interest in such subjects as ventilation,
water, healthy rooms, infectious diseases, an
like. On these grounds we have no hesitation
commending this admirably conceived little bo
all interested in living among healthy surroundi
a healthy home.

## Obituary.

Notice has been received of the death of
following:—

On May 25, John Lee, Chemist and Druggi
Sutherland Gardens, W. (Aged 74).

On May 28, Charles Phillips, Chemist and
gist, late of Birmingham. (Aged 47).

On May 30, Henry Augustus Fisher, Chemist
Druggist, of Ramsgate. (Aged 62).

On June 3, Benjamin Colley, Chemist and
gist, of Tipton, Staffs. (Aged 48).

On June 4, John Langman, Chemist and Drug
of Haddenham. (Aged 52).

On June 5, Thomas Shuttleworth, Chemist
Druggist, of Walton, Lancs. (Aged 61).

On June 7, William Cottingham, Chemist
Druggist, of Lincoln. (Aged 73). Mr. Cotting
was a member of the Society.

On June 7, Joseph Beech, senr., Pharmaceu
Chemist, of Birmingham. (Aged 78). Deceased
a Founder of the Society, and throughout its hi
manifested a loyal interest in its work. His
will be widely regretted.

On June 8, Joseph Grayson, Chemist and Dru
of Whitehaven. (Aged 73).

## Correspondence.

### THE REVISION OF THE BRITISH PHARMACOPŒIA.

Sir,—Your article in the Journal of June 2 leads me
think that the revision of the Pharmacopœia will be
event of the near future. Most persons engaged in
practice of medicine or pharmacy will take consid
interest in the progress of the work, and I hope you
allow a full discussion of the subject in the Jo
Probably there are few pharmacists who could not, if
would, draw attention to some point previously
looked, and I shall be glad if you will give me
make a few remarks more particularly concerning
characters and tests of some preparations. I shall f
the order of the Pharmacopœia.

*Acidum Oleicum.*—The statement that this is "a
*fatty* acid . . . with not more than a very faint acid
tion," needs some qualification. Its equivalent
titrated in alcohol with sodium hydrate and phenol-
lein would furnish a useful test.

*Aloes and Aloin.*—The action of strong nitric
Barbados aloes results in a crimson coloration which
not fade for some time. Natal aloes is similarly
upon. Hepatic and Socotrine aloes give no such
tion. The aloins behave in the same manner as the
from which they are obtained. Might not this
be added to the physical characters as an aid to
cation?

*Aqua Destillata.*—Is there sufficient evidence
addition of potassium permanganate is an advan
experience in distilling water, both on the small

aboratory purposes, when separate fractions can be llected, and on the large scale for aerated waters, when is practically out of the question to do without a con- ant supply of fresh water to the boiler, has convinced e that such addition is a decided disadvantage. Potas- um permanganate breaks up and renders volatile matters hich would otherwise remain in the retort; every alyst knows what a considerable fraction must be dis- led over before the action is complete, whereas free am- onia if present is soon removed when dealing with large antities. I would suggest that the water be first ftened by Clark's process, or by the addition of a small antity of sodium carbonate or hydrate, and distilled ter removal of the lime salts. Mr. Young has shown at certain acid bodies which otherwise distil over are tained if sodium carbonate is used. Under "tests":—the sence of action on litmus should be mentioned. Dis- lled water carelessly prepared is acid in reaction.

*Arsenii Iodidum.*—The official dose of this compound is idently too small, for when in solution as liquor arsenii hydrargyri iodidi ten times as much is ordered.

*Limonis Succus.*—The standard of citricity is much too gh. Mr. T. H. Williams Idris has shown, after ex- mining a large number of samples, that twenty-five to irty-five grains per ounce would be a much truer andard.

*Liquor Magnesii Carbonatis.*—Volumetric determination ith a mineral acid and tropæolin would be much simpler d more accurate than the use of oxalic acid and litmus as w proposed. The same remark applies to the estimation of uor potassæ effervescens and liquor sodæ effervescens.

*Liquor Potassæ.*—I would suggest that if a method be ven for this preparation, potassium bicarbonate should be bstituted for the carbonate, because it is more definite in mposition and much purer. The formula might be as llows :—

| | |
|---|---|
| Potassium bicarbonate ..................... | 1 part. |
| Slaked lime, washed ..................... | 1 part. |
| Distilled water to make.................. | 8 parts. |

ssolve the potassium bicarbonate in the water, boil for n minutes, add the slaked lime, and continue the ullition another ten minutes, etc. It should be volu- trically adjusted to normal strength. One fluid ounce ntains about twenty-six grains of potassium hydrate. e same method might advantageously be adopted with uor sodæ.

*Lithium Carbonate.*—This salt is soluble in about 70 rts of water at 15°·5 C. The saturated solution has a ecific gravity of 1·016. 50 C.c. require for neutralisation ·3 C.c. of normal acid. One gramme of the dried salt re- ires about 27 C.c. with tropæolin as indicator. Its com- ete solubility in strong hydrochloric acid indicates the sence of sodium salts.

*Sapo Animalis.*—The quantity and neutralising power the ash of this and other kinds of soap would be valuable lications of their purity.

*Spiritus Ammoniæ Aromaticus.*—No simple relationship ists between the ounce and the cubic centimetre, hence carrying out the official test a calculation is necessary, those who use grain-measures are very few in number. actual practice it is often most convenient to measure e substance, in terms of ounces, and the test solution in bic centimetres; if the value of a cubic centimetre in rms of grains of the substance is known, much calcula- n is saved. Such a procedure may be unscientific, but it rks well. I introduced this method in a laboratory where me thousands of volumetric determinations are made nually, and every chemist who has since had this routine work to do has gladly adopted it. With regard to the test for carbonate in this preparation, most samples will yield, after filtration, a further precipitate on standing with excess of barium chloride, due to absorption of carbon dioxide, therefore it should be stated that the precipitation referred to would take place at once.

*Spiritus Rectificatus.*—The same want of uniformity with the metric system obtains here in one of the tests.

The subsequent notes refer to articles in the appendix.

*Benzene.*—On distillation the principal fraction passes over about 80°·5 C. Its sp. gr. at 15°·5 C. being 0·885.

*Test Solutions.*—The strength of these solutions might be advantageously approximate values of the equivalent weights of the substances, as it is very convenient that they should have some common relationship other than that of percentage strength. I have adopted the following :—Dekanormal—hydrochloric, nitric, sulphuric and tartaric acids, ammonia, caustic soda. Pentanormal :—ammonium chloride. Dinormal :—ammonium phosphate, barium chloride, calcium chloride, caustic potash, magnesium sulphate, sodium carbonate. Normal :—Ferric chloride, lead acetate, platinic chloride, potassium chromate, iodide and permanganate, silver nitrate. Quinquenormal :—Barium hydrate. Tropæolin may be conveniently kept in solution, 1 part per mille in 20 per cent. spirit, and as the indicator sold under this name varies much in sensitiveness, I would suggest the following test :—One C.c. of this solution diluted to 100 C.c. with distilled water undergoes a distinct change of colour upon the addition of 0·5 C.c. decinormal hydrochloric acid. This test allows a considerable margin. Neutral ferric chloride is ordered as a test, and should therefore be officially recognised.

*Volumetric Solutions.*—I would very strongly plead for the introduction of a volumetric solution of a mineral acid instead of the present oxalic acid. Except for the determination of permanganates, I do not know that oxalic acid has any claim to recognition, and it is not used officially for this purpose. Whether hydrochloric or sulphuric is the better acid for general use is a proper subject for discussion; both give very sharp reactions with indicators. Sulphuric acid might possibly be used for lead salts instead of oxalic acid. Commercial hydrochloric acid is usually about 1 per cent. stronger than dekanormal, so that 1 volume diluted to 10 volumes furnishes a solution which requires but slight adjustment to make it normal. I should also like to see a volumetric solution of potassium permanganate introduced as an alternative in some instances to potassium bichromate; a normal solution keeps fairly well, but a decinormal solution is very unstable. In making volumetric solutions the official cylindrical jar might be dispensed with, and a narrow-necked flask used instead. In addition to the values assigned to a volumetric solution in terms of the official preparations to be tested with them, the value of a cubic centimetre in terms of the active substances to be determined in those preparations should also be given thus :—1 cubic centimetre of normal acid is equivalent to calcium hydrate, 0·037 gramme; calcium oxide, 0·028 gramme. I venture to think that it is a factor of this kind which is commonly required.

130, *Fellows Road, Hampstead.* W. H. Symons.

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### The Pharmacy Acts Amendment Bill.

Sir,—I did not notice the letter of Mr. Jones, of Coventry, in your issue of the 12 ult.; but quite agree with "Southport" in that of the 2nd inst., and think that in your footnote to his letter you treat the matter far too lightly. We wish to prevent the possibility of any abuse of a title from arising, and a person cannot very well be prevented from displaying a title to which he has an undoubted right. I think the Council of the Society has quite enough to do at present without investigating all the cases that would inevitably arise, although it would have the power of removing offenders from the Register of the Society when the offence was proved. For my part I do not see that those who have only passed the First examination require any title at all; or, if they do, that anything beyond their present title of "student" is needed. The title of "associate" is not used to any degree by "Minor" men until they come to be in business on their own account. I hope the Council will see what trouble the proposed new title would give those who have passed the First examination, and will take steps to prevent it. There is one more point I wish to touch on before concluding, viz., that of "jury service." I hope that the Council will insert a clause to give the "Minor" man an equal exemption from jury service with the "Major" man. This exemption was not given to the "Major" man as a sort of small reward for his higher qualification, but solely and purely in the interests of the public, so that he should not be caused to leave his shop by being summoned on a jury, and expose his customers to the risk of being served by unqualified hands. I do not believe that at the time it was intended solely for those who had passed the Major examination, as at that time the "Major" was a far simpler matter than the "Minor" is now. I believe that by the term "pharmaceutical chemist" the compilers of the Act really meant every chemist who was in business on his own account. At that time it was intended that the "Minor" should be the qualification of assistants only. Now, however, owing to the continual raising of the standard, it has come to be looked at in quite a different light, as being quite sufficient in itself for the protection of the public. At present, to a very great number who, like myself, are working a business single-handed, to be summoned on a jury would be a great hardship and inconvenience, and would mean a temporary closing of the shop.

*Tewkesbury.* L. L. STROUD.

⁂ Our correspondent is correct in his belief that it was desired that every chemist should have the title of pharmaceutical chemist, and had that desire been reciprocated, there would not at the present time be any ground for dissatisfaction as to liability to jury service. The exemption of pharmaceutical chemists when the Jury Act was passed was effected because they occupied at that time a definitely recognisable position, while chemists and druggists could not then be defined for the same purpose. Under existing conditions, however, a proposal to extend exemption from jury service cannot be submitted to Parliament until a Bill dealing with that subject is under consideration, and it has been repeatedly stated that whenever that opportunity presents itself, the Society will move for such an extension to registered chemists and druggists.—[ED. *Pharm. Journ.*].

Sir,—Unfortunately there is nothing to prevent anyone keeping an open shop or practising pharmacy so long as poisons are not dealt with. There are many unqualified men in the country who very seriously compete with their legally qualified neighbours, and so long as such unqualified men comply with the law there is nothing to prevent them doing a considerable bulk of the usual business of a chemist, including a certain amount of dispensing. If it be so arranged, by a clause in the proposed Act, or otherwise, that the title "Associate of the Pharmaceutical Society" cannot be used by such men, then nothing further need be said. If, on the other hand, the title is free to all law-abiding yet unqualified competitors who have passed the educational examination, it might possibly constitute, in certain cases, a distinct "trade danger."

*Coventry.* H. W. JONES.

### THE ANNUAL MEETING.

Sir,—I venture through your Journal to ask to be allowed to enter my strong protest against the immense latitude allowed to the speakers at the annual meeting, as it greatly interferes with the real business to be transacted, and for which we are assembled, it wastes th of the hearers, and can only flatter the conceit of tho talk for the sake of talking, or who consider it a good op tunity to indulge in personalities. It may, perhaps allowable in a public position like that held by our President to make remarks when he, in his official capa may be thought to have erred or made any mistake, b protest against personalities, and I consider that " meeting" should always insist upon and show respect for the office by speaking of him as our Presid and to him (while in the chair) as Mr. President.

AN IMPATIENT LOCAL SECRETAR

### WHAT IS A POISON?

Sir,—Might I venture to add a sentence to what recently so ably said by the President on the above subj It seems to me that the confusion which has overtaken legal mind on this question has arisen from a failure to cognise that the word "poison" may be used in two diff senses. In a prosecution for murder or attempted mu it might be necessary to prove, directly or indirectly, the amount of poison administered was sufficient to The "poison" in such a case might be one or other hundred things, say sulphuric acid. With "poison" in sense of the word the Pharmaceutical Society has concern. Within the meaning of the Pharmacy "poisons" are specified articles, which no one retail who is not legally qualified. The amount sold nothing to do with the question. To expect the Pharmaceutical Society to call evidence to prove that the amount of a scheduled poison present in a bottle of some preparation sold would be sufficient to cause death is the height of absurdity. Why, then, have any "poison schedule" at all? If it be legal for any huckster to sell a bottle containing a quarter of a lethal dose of strychnine or the like, it is evidently only necessary for a poisoner or suicide to buy four bottles to get his full dose. Should this extraordinary interpretation of the law ultimately prevail, surely the Vice-President of the Council would undertake to get a short Act passed through Parliament in order that the regulations of his own Council should not be stultified.

*Edinburgh.* D. B. DOTT.

## Diary of the Week.

### WEDNESDAY, JUNE 20.

*Royal Microscopical Society*, at 8 p.m.
"On the Unreality of Certain Characters, generally accepted for Specific Diagnosis, in the Dis macese," by T. Comber.
"Foraminifera of the Gault of Folkestone," part xi, by F. Chapman.

*Edinburgh Chemists' and Assistants' Association.*
Botanical Excursion to Colinton Dell. To meet at Caledonian Station at 3.30 p.m.

*Western Chemists' Association (of London)*, at 9 p.m.
"The Proposed Alteration in the Method of electing Annuitants to the Pharmaceutical Benevolent Fund," by R. H. Parker.

### THURSDAY, JUNE 21.

*Chemical Society*, at 8 p.m.
"The Specific Character of the Fermentation Func tions of Yeast Cells," by Adrian J. Brown.
"The Interaction of Lead Sulphide with Lead phate and Oxide," by J. B. Hannay.
"The Oxidation of Tartaric Acid in the Presence Iron," by H. J. H. Fenton.
"The Relation between the Solubility of a Gas the Viscosity of its Solvent," by Professor Th and J. W. Rodger.

*Linnean Society of London*, at 8 p.m.
"On Tabulation Areas," by C. B. Clarke.

*Royal Society*, at 4.30 p.m.
Ordinary Meeting.

COMMUNICATIONS, LETTERS, etc., received from Mess Bagshaw, Cracknell, Davis, Naylor, Symons, Th Warren.

# CEARÁ JABORANDI.

BY E. M. HOLMES, F.L.S.

*Curator of the Museums of the Pharmaceutical Society.*

When any drug becomes scarce in the drug market it is liable to be represented by less valuable substitutes. To this rule jaborandi is no exception. Soon after it was introduced into medicine in this country a species of *Piper* was offered in London as jaborandi (*Pharm. Journ.*, [3], v., p. 781), and for many years the leaves of *Pilocarpus pinnatifolius*, Lem. (which contain less pilocarpine) have been found in commerce at intervals.

During the last year the leaves of *Pilocarpus microphyllus*, Stapf, have been offered, and since February last a new kind of jaborandi, resembling the genuine article in several points, has appeared. This, although belonging to the same genus, has evidently not the same medicinal value as that of Pernambuco, for when chewed it does not cause a free flow of saliva, but only a pungent taste, which endures for some little time. Through the kindness of Messrs. W. J. Bragg and Co., of Liverpool, I have been furnished with the following information concerning Ceará jaborandi:—

"The consignment was received from Ceará, which port is used by some up-country shippers in conjunction with Pernambuco. It is by no means a new thing for jaborandi leaves to be received from Ceará. The mport is, however, very irregular, and some years nly a few stray bales arrived. According to my otes (which are likely to underrate the quantities), n 1892 there arrived about seventy-two bales from Ceará, and about fifty bales from Maranham, whilst ast year the importations were about eighty bales rom Ceará, and 117 bales from Maranham, and wenty bales from Parahibe, a large proportion of which was immediately exported to the Continent. Early in 1892 these leaves were sold here at 4*d*. a lb., nd all subsequent arrivals were eagerly bought up at dvancing prices, till 1*s*. 6½*d*. was reached early in 893, and since then the price has fluctuated between *s*. 4*d*. and 1*s*. per lb. The leaves from Maranham are xactly the same as from Ceará. The import this year as been, so far, 195 lbs. from Maranham and 55 lbs. rom Ceará, of which more than half has been immediately re-exported to the continent. The usual kinds nported from Maranham are No. 1 (*Pilocarpus aborandi*) and No. 2 (*Pilocarpus trachylophus*). Of No. 3 (*Pilocarpus microphyllus*) there have been to ur knowledge only two small imports, and both sold ell, buyers giving them a preference over the usual nds."

It thus appears that there is a possibility of ifferent leaves being exported under the same ame from neighbouring ports, or even from the me port. It therefore behoves the pharmacist o exercise his botanical knowledge in discriminang between leaves of plants from the same nus, which may vary considerably in their edicinal value, bearing in mind that such rutiny should always be exercised when a drug ses in price.

It may be useful, therefore, to point out how these rieties may be distinguished by the naked eye with the use of a lens, leaving for the present e consideration of their histological differences, hich entail the expenditure of more time.

The true jaborandi, *Pilocarpus jaborandi*, which ould be distinguished by the name of Pernambuco jaborandi, has coriaceous, oblong lanceolate leaflets, glabrous on both sides, having an emarginate apex, and slightly unequal at the base. The lateral veins are distinctly prominent on the upper surface. When held up to the light numerous large oil glands become visible. The tint of the leaves is of a brownish-green. The leaflets of *Pilocarpus pinnatifolius*, or Paraguay jaborandi, are usually obovate-lanceolate rather than oblong, of a thinner and more papery consistence, of a grey-green hue, and are also furnished with large oil glands. The leaflets of *Pilocarpus microphyllus* are at once distinguishable by their small size, being usually 1–1½ inch long, by their ovate-lanceolate, or almost rhomboidal outline, the leaf being widest below the middle, and one half of the leaf usually larger than the other half, this being especially noticeable near the base of the leaflet. The leaves are quite glabrous, and the apex is deeply emarginate. Large oil glands are present. The leaves of the *Piper* offered as jaborandi are so different in appearance that they are not likely to be mistaken for the genuine drug. They are ovate-lanceolate and acuminate, of a thin texture, of a greyish-green colour, and possess only extremely minute oil glands.

The new variety of jaborandi from Ceará presents the following features:—The leaflets, Fig. 1, A., resemble those of the true or Pernambuco jaborandi in their coriaceous or leathery texture, and in the dark green or brownish-green colour of the upper surface and in the emarginate apex, but differ in the under surface of the leaf being covered with short, curved, simple, unicellular hairs (see Fig. 1, B.). On the upper surface these hairs are present on the midrib, but are only sparingly visible elsewhere on the upper surface. The margin of the leaf is also strongly incurved. When chewed it does not cause a free flow of saliva. These characters are only selected for pharmacognostic purposes, the botanical distinctions not being readily available in commercial specimens, for the different species of *Pilocarpus* vary as a rule more in the shape, size, and surface of the fruit, and in the relative length of its pedicel, than in the character of the leaflets.

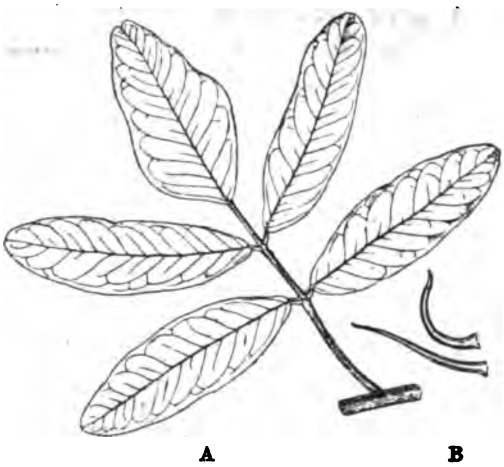

Fig. 1.—*Pilocarpus trachylophus*; A., leaf, one-third natural size; B., hairs from under surface of leaf, much magnified.

The fruits are usually present in the commercial article, and these, taken in conjunction with the leaves, show that the plant belongs to an undescribed species, which may be characterised as follows:—

*Pilocarpus trachylophus*, n.sp.—Ramis cortice albide, tenui, puberulo; foliis imparipinnatis; foliolis bijugis ellipticis vel oblongo-ellipticis, 5–10 c.m. longis, 1½–4 c.m. latis, apice emarginatis, basi rotundatis inæqualibus, marginibus reflexis, supra olivaceo-viridibus, pilis sparsis, venis lateralibus prominulis, subtus luteo-viridibus evidenter puberulis, pilis albidis crispis vel incurvis, petiolulis lateralibus, 2 m.m., terminalibus 1–2 c.m. longis; racemis 1½–2 d.c.m. longis; carpellis 1 c.m. longis, ¾ c.m. latis, ovatis compressis, apicem versus dorso oblique verrucosis, rugosis, lateribus lævibus puberulis, pedicellis crassis 2 m.m. longis. Flores non vidi.

From the above description it will be seen that this species differs from *Pilocarpus jaborandi* (*Pharm. Journ.*, [3], v., 581, and vol. xxiii., 1008) in the very short pedicels of the fruit, and in the hairy character and yellowish colour of the under surface of the leaf. The fruit differs from that of *P. jaborandi* in its smaller size and in the absence of the transverse zones or ridges which form so marked a feature in the carpels of that species and of *P. pinnatifolius*. The carpels probably remain adherent until mature, since the contiguous sides are smooth and the back of the carpels only are marked with oblique, warty, undulated ridges (Fig. 2, A., B.). The carpels are compressed and rounded, not angular, at the apex.

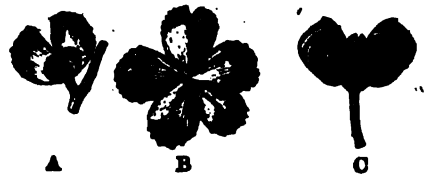

Fig. 2.—Jaborandi fruits, natural size; A., *P. trachylophus*, with two carpels, showing the short pedicel; B., the same, with five carpels, seen from above; C., *P. pinnatifolius*, Engl., showing longer pedicel and lateral zones on the carpels.

The carpels of *P. pinnatifolius* are angular at the apex, so as to present a more truncate appearance (see Fig. 2, C.); the transverse zones are distinctly visible on the sides of the carpels, and are connected by a network of slender raised lines. In size they resemble those of *P. trachylophus* (Fig. 2, A. B.) The carpels of *P. jaborandi* are 1¼ C.m. long and nearly 1 C.m. broad, with prominent transversely-zoned ridges (see *Pharm. Journ.*, [3], v., 582, Fig. 4, 5, 6). The pedicel of the fruit is about 1 C.m. long in *P. jaborandi*, 8 M.m. in *P. pinnatifolius*, and 2 M.m. in *P. trachylophus*. In *P. pinnatifolius* the fruits are very numerous and crowded together, in *P. jaborandi* and in *P. trachylophus* the fruits are sparingly formed, the flowers apparently being very deciduous.

The leaves and fruits of the commercial plant have been seen by Professor Dr. Engler, who remarks on the great similarity of the leaflets to his *P. longiracemosus*, which, however, has simple, not pinnate, leaves.

Two seeds of the plant have been forwarded by me to Mr. R. I. Lynch, at the Cambridge Botanic Gardens, and as these seeds have germinated i may be possible in the future to obtain the pl in flower.

In the above note I have referred the Paraguay jaborandi to *P. pinnatifolius*, Lem., since *P. selloanus* is described and figured by Engler (Martius, 'Fl. Brasiliensis,' vol. xii., pt. ii., p. 135, tab. xx.), as having pedicels uniformly 1½ C.m. long, whilst in the fruits found in the Paraguay jaborandi of commerce they are only, as in *P. pinnatifolius*, about ¾ C.m. long.

## NOTE ON THE ALKALOID OF CEARÁ JABORANDI LEAVES.

BY DR. B. H. PAUL AND A. J. COWNLEY.

Examination of the leaves described by Mr. Holmes in the preceding paper has led to the result that they do not contain any considerable amount of a base forming a crystallizable nitrate corresponding to the salt of pilocarpine. When treated according to the process described in the British Pharmacopœia, the leaves yielded a dark coloured amorphous base, amounting to 0·4 per cent., as determined by titrating the residue of the chloroform solution, and on the assumption that the neutralising power was the same as that of pilocarpine. From this only 0·02 of crystalline nitrate could be obtained.

Another quantity of the leaves was treated with caustic lime and alcohol to extract the alkaloid. The product thus obtained amounted to only 0·13 per cent., apparently owing to partial decomposition of the alkaloid. This circumstance supports the conclusion that the base obtained by the B.P. process was not pilocarpine, inasmuch as treatment with lime does not appear to exercise any decomposing action upon pilocarpine.

## THE MANUFACTURE OF CALOMEL IN JAPAN.*

BY EDWARD DIVERS, M.D., F.R.S.

(*Concluded from page* 1050.)

*Of the Plant.*—The apparatus for making Japanese calomel consists of a table-furnace supporting sixt cast-iron pots lined and surmounted with the Shu kayama earth or 'mitsuchi,' on which rest, as cove and condensers and receivers of the calomel, u glazed clay cups bottom upwards.

On a smoothed clay hearth the walls of the furna are raised in clay, building in the three stones whi frame the stoke-hole. The walls are 2·6 ft. high, a the enclosure is 7·6 ft. by 4·7 ft., measured outsid The stoke-hole is 1 ft. by 1 ft., but a little wider th this at the base, and is without door. The table pots and roof of the furnace is constructed by lay a square iron rod on each of the long walls, and these eleven cross rods, also square, on which are ta the flanges of the pots. The pots are then put in p tion as close together as possible, hanging by th flanges, in ten rows of six each, and plastic c pressed into the openings left between the flange the roots, and the roots and flanges covered in s only the mouths of the pots remain visible. The nace clay being thoroughly dry, it is deeply laid with the red earth, mixed with a little bay-sal moistened with bittern in small quantity. The pots are also filled with the same moist red earth, except in a central cylindrical shaft, reaching to the bottom of the pot, which is left bare. The pot is 0·5 ft. deep inside, and across its mouth, inside, is 0·45 ft. The shaft or cavity left in the filling is 0·18 ft. in diameter, and is shaped by resting a wooden core on the bottom of the empty pot, and then pressing in the moist earth round it, smoothing off the top, and dropping a perforated board over the projecting core to hold down the earth while withdrawing the core, which is then removed by its handle. The furnace is now ready for work. It should have been mentioned that after the clay walls of the furnace are built they are framed in with wood to increase their stability and to give support to a wooden back and to shelving above the table.

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* From the *Journal of the Society of* *Industry.*

*Of the Firing.*—The firing the pots is kept far below what are usually regarded as furnace heats. The fuel employed is wood, and the Japanese are clever in the use of this economically and effectively in firing pots for boiling, evaporating, distilling, or subliming. Five lengths of firewood are ranged along the back and front walls on the hearth, generally raised at one end by resting on a lump of clay. In the ordinary working of the furnace, as I saw it, the heat from previous work is sufficient to kindle the fresh wood. The flames rise up the sides and run over the bottoms of the pots, leaving the central space in the chamber free from flame. The air enters by the lower part of the stoke-hole, and the products of combustion escape invisible by its upper part, so perfect is the combustion. At the time of first lighting the fire, and of irregularities in stoking, some smoke is unavoidable, and to keep the top and table free from this smoke and from ashes, a wooden back is put in above the table. There is also a wooden hood and flue above the stoke-hole to carry off any smoke; this is similar to those put up in England and elsewhere over the working doors of furnaces to protect the workman from arsenic, sulphur, or other noxious fumes. The heating is so well effected that the pots two feet above the burning logs are made sufficiently hot, barely red-hot at the bottom, and yet the wooden frame on the outside of the furnace is not charred, and the work-room is not unpleasantly warmed.

About three bundles, or 40 lb., of wood serve for one firing, and it is remarkable to see so little fuel working so many pots.

*Of the Working.*—A compost of burnt 'mitsuchi' with about a fourth of its weight of bay-salt is made up with bittern into lumps the size of large chestnuts.

The furnace being hot enough, the 'mitsuchi' surface of the table is once for all freely wetted by a watering pot, perhaps half a gallon of water being used, all of which is absorbed; a lump or two of compost is dropped, by tongs or by hand, into each pot in rapid succession, a very small spoonful of mercury poured into each pot, the total charge for the sixty pots being somewhat less that one pound avoirdupois (more exactly, ⅞th of a lb.), and a clay cup, bottom up, placed over each pot and adjusted by gently pressing and turning it round slightly. The cup is thus made to fit neatly on the earthen top without adhering to it in the least. The cups are thick and unglazed, but become very smooth inside by use. They have an inside diameter at the mouth of six inches and a depth of three inches.

Thus arranged, the pots and cups are left for three hours, and during the latter part of this time the furnace is cooling. When cool enough, each cup is lifted in turn, and, with two turns of a feather, the 'keifun' or calomel, which fills it in the form of a sparkling network of delicate crystalline scales, is transferred to a sheet of paper held under it, and the cup mouth downwards placed on a shelf of the furnace ready for use in the next operation.

The calomel, it will thus be seen, forms no adherent cake in the cup, but particles only loosely hanging together. So obtained, it is ready for the market, needing only to be packed in small wooden boxes for sale.

The spent lumps of earth and salt are lifted out of the pots, and when the furnace has become still cooler, the fire is made up again, the furnace top freely wetted, and a new operation set going as before. The furnace is worked twice each day. Nothing could well be carried out with greater simplicity and less expenditure of labour and time.

*Of the Yield.*—The loss, I am told, is about 16 per cent. of the theoretical amount of calomel, which is, I believe, about twice as much as is lost in the Western process.

*Experimental.*—If one of the cups is removed a few minutes after the operation has been started, much of the mercury is found in it as a sublimate of fine globules, mixed with only a little almost amorphous calomel, from which it would appear that the formation of the calomel results from reaction in the cup between the mercury in vapour and the active gases.

On dipping into the pot, uncovered during the process, a glass rod with a drop of water hanging to it and then withdrawing it, and testing the remainder of the water with potassium iodide and starch, no chlorine can thus be detected. The same is true when a drop of solution of potassium hydroxide is used. Nor can the slightest odour of chlorine be detected in the vapours issuing from the uncovered pot.

On passing air containing a little hydrochloric acid gas through a tube in which mercury is freely boiling, sparkling calomel is formed close to and mixed up with the mercury.

Red earth which has been used in the process turns moist red litmus paper blue, while fresh red earth is neutral.

*Theoretical.*—The nature of the materials used and the observations gained by the preceding experiments are sufficient to establish that the calomel is formed by a reaction between mercury vapour, oxygen, and hydrochloric acid gas, in which, along with mercurous chloride, water is formed—$4Hg + 4HCl + O_2 = 4HgCl + 2H_2O$, and that the formation takes place at a temperature near—above or below—the boiling-point of mercury, and much below that at which calomel freely volatilises. The source of the hydrochloric acid is certainly the magnesium chloride of the bittern and bay-salt, which heated in a moist atmosphere, even in the presence of sodium chloride, is, as is well-known, partly converted into magnesia and hydrochloric acid. Hence the alkalinity of used 'mitsuchi.'

The porosity of the walls of the apparatus, particularly of the layer of 'mitsuchi' on which the clay cup rests, must be more than sufficient to allow enough air to enter during the working. I had supposed that the hot hydrochloric acid and air might, in contact with the earth, have yielded a little chlorine, but the temperature reached in the process normally worked seems never to reach that required for the liberation of chlorine.

The Chinese process, if correctly described, differs from that used in Japan in several material points, one of which is that the mercury is intimately ground up with the other materials, and one fails to see what reaction can take place between it and the two others, namely, salt and alum. Heated, the mixture must give off mercury and hydrochloric acid, and then these, as in the Japanese process, will with air give the calomel, but this is independent of the previous intimate mixture of the mercury with the salt and the alum. Another point is that in place of the magnesium chloride of sea water as the source of hydrochloric acid, the Chinese are said to use alum or copperas, which, with the salt, will react to give hydrochloric acid. A third point is that the cover is said to be closely luted to the iron pot, which must nearly exclude the air, without which it is impossible to explain the formation of the calomel. Perhaps this is the reason why the Chinese process is said to take four or five hours firing, since this may give time enough for the needed oxygen to diffuse through the cup and luting, it will also account for the fact, if it is one, that the yield of calomel is markedly less in weight than the mercury used. Again, there are to be noticed the statements that the iron pot is exposed for hours to the strong heat of a charcoal fire, and that the hot clay cover is cooled by throwing cold water on it, statements which must be regarded as greatly exaggerated, if not erroneous. Lastly, the calomel-giving vapours are allowed to remain in contact with the hot iron of the pot, instead of being kept from it by the thick lining of earth provided in the Japanese process, a contact which such vapours could not stand without destruction. I think, therefore, that we may be fairly doubtful whether any reliable description has yet been given concerning the Chinese process, which we may expect to find to differ little, if at all, from the Japanese process, except in salt and alum being used in place of the mother-liquor of sea-salt or "water," as Ono Ranzan supposed it to be.

One thing to which attention may be called is that the Chinese are stated to add some nitre to a similar mixture when employed to give corrosive sublimate. For that being the case, it is seen that free chlorine, which would here be developed from the salt, nitre, and alum, is necessary for the production of the higher chloride, and that air and hydrochloric acid can only yield the lower chloride, a difference of much theoretical interest, and indeed of practical moment also. It is known that re-sublimation of calomel generates some corrosive sublimate, and, although authorities are not quite agreed as to whether reaction occurs between gold leaf and calomel vapour, it is hardly to be doubted that such reaction does occur. Now I have found that if in the Japanese apparatus the temperature of the cover be raised sufficiently to volatilise much of the calomel, the remaining calomel is no longer free from corrosive sublimate. It must, therefore, be borne in mind that the calomel formed in the Japanese process is not, and cannot be, the result of true sublimation, but of precipitation as fast as formed from the three gaseous bodies which give rise to it. At the temperature at which mercury boils, calomel is either quite fixed, or, at most, has a vapour of exceedingly small tension. In the two facts that the three gases do not react to yield corrosive sublimate, and that the calomel is not heated to its volatilising point, lie the explanation, and, at the same time, the assurance that Japanese (and Chinese) calomel contains no corrosive sublimate.

*Summary.*—The Japanese prepare calomel pure, above all things free from corrosive sublimate. They heat balls of porous earth and salt soaked in bittern along with mercury, in iron pots lined with earth. The heat forms hydrochloric acid from the magnesium chloride in the bittern, and the mercury sublimes into the closely-fitting but unattached clay covers of the pots. Air enters by diffusion, and oxygen and hydrochloric acid gas act together in the hollow cover on the vapour given off from the sublimate of mercury there formed. The cover thus becomes filled with a network of micaceous particles of calomel, precipitated at a temperature below its subliming point at the moment of its formation.

This investigation of an interesting product of Japanese industry has been carried out under the authority of the Imperial University of Japan. I cannot acknowledge fully enough the indispensable assistance I have received from my colleague, Assistant-Professor Haga, F.C.S.

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## THE ONLY SALVATION OF THE PHARMACIST.

BY DR. OSCAR OLDBERG.

*Dean of the Illinois College of Pharmacy.*

Every observing pharmacist knows that all matters pharmaceutical in our country are in an unsatisfactory and unsettled condition. We hear on every hand and on all occasions the clamour of contention upon questions of a purely commercial bearing. Whether or not any trade combination that can be effected will ever cure the ills of purely mercantile competition is a problem which we do not care to discuss. One thing is clear, that when druggists enter upon a contest for the monopoly of purely commercial business they have absolutely no right or advantage that does not belong equally to other merchants. No merchants, as such, can escape the keen commercial competition of the day. The tailor cannot compete with the dealer in "hand-me-downs," but if he is skilled in his work and does it well he is not subject to any such competition. The druggist, too, so far as he "handles" his wares purely as a merchant, must find himself in purely mercantile competition with other druggists and merchants who deal in the "hand-me-downs" of the drug business. Druggists who are content to devote their time and energies to that kind of competition, and who are struggling in vain to escape the inevitable consequences, have no right to complain. But pharmacists, who have a higher ambition and possess the requisite education and technical skill, compete for success in life upon an entirely different plane. The writer firmly believes that better education, and an earnest effort to demonstrate the importance and value of the professional services of the pharmacist to the community and the medical profession, will certainly emancipate pharmacy as a profession from the degrading influence which purely commercial competition must of necessity have when applied to the business of furnishing medicines to the sick.

The public and the physicians will certainly and gladly avail themselves of the professional services of the pharmacist, to an extent that will make his calling not only honourable, but at the same time as remunerative as that of other professions, if the standard of education in the pharmaceutical profession be such as to command the confidence and respect of intelligent men. And it is just as certain that if the pharmacist is not sufficiently well educated he will not enjoy that respect and confidence which are indispensable to his success as a professional man.

The American druggist of the day complains bitterly of the manufacturers of pharmaceutical preparations, the jobbers, the physicians, and the public. Manufacturers of fluid extracts, pills, and other preparations are berated because they have not only successfully taken out of the hands of the pharmacist a good part of his business, but also because they are equally successful in persuading physicians to specify the preparations of particular firms, and thus compelling the pharmacist to handle their products. Makers of "patent medicines" and also the wholesale druggists are watched and remonstrated with to prevent them from selling to "cutters," and "black lists" are made of the offenders, wholesale or retail. Physicians are denounced for specifying A and B's elixirs, C and D's fluid extracts, E and F's pills, and Z's specialties or proprietary preparations, and for dispensing their own prescriptions. Tablet triturates and other modern forms of ready-made medicines which can be carried about by a certain class of doctors or kept in stock in their offices, rendering the services of the pharmacist superfluous, are cordially hated. The venal, the thoughtless, and the well-meaning fools who "endorse" and recommend the various numerous cure-alls, the trade journals and newspapers which fail to expose the impositions because they value the advertising patronage more highly than the public good, are roundly abused, and the public is given up as hopelessly gullible.

That pharmacists have many real evils to contend against, and that they also suffer from many imaginary wrongs, is true. But what have they done to remedy these evils? Have they really demonstrated to the satisfaction of the intelligent portion of the community and the clear-headed and conscientious physician that these evils are indeed such as do serious harm not to the pockets of druggists merely, but to the public welfare and to the best interests of true medical science? Have they shown that there is really a distinct field of professional work called pharmacy, which, for the safety of human health and life, should be entrusted only to specially trained workers, and that we have, in fact, a corps of pharmacists whose education is such as to entitle them to be considered as professional men, worthy to be trusted far beyond the lines of mere commercial and mechanical routine? To remedy the evils complained of, the pharmacists as a body must establish beyond question their right to the respect and confidence of their fellow men by virtue of thorough professional education; the pharmacy laws must be amended or construed to make a reasonable measure of systematic pharmaceutical education compulsory; and in all that is done for the advancement of the material interests of the profession, the public good must be the chief object in view.

The pharmacist cannot compete with the manufacturer for many obvious reasons; but the pharmacist of the future, instead of competing with the manufacturing establishments, will be expected to perform new duties which he has not yet entered upon in any systematic and thorough manner. These new duties demand far better education and training than he has heretofore had.

The Pharmacopœia of the United States is in advance of the education of the average druggist of the country. No other pharmacopœia furnishes such clear and complete definitions, descriptions, and tests; but the average American druggist is not well enough educated to apply intelligently and safely the official standards of purity and strength, or even the identity tests, or to pass intelligent judgment upon the quality of the products made by the manufacturers. In fact, the manufacturers frequently employ pharmacists and chemists whose education and skill are far above the qualifications of the average druggist. As I write this simple statement of incontestable facts I imagine I can hear how some of our self-constituted spokesmen of the "profession" will, when they read it, rend the air with their ejaculations and cry treason; but the statement is literally true and will remain so until its truth is so thoroughly recognised that the only remedy possible is applied. It is time, indeed, that the pharmacists of America should bestir themselves and not rest until they shall have firmly established such a distinction between the educated pharmacist and the mere vendor of drugs, that the restoration of confidence in and respect for the pharmaceutical profession may be realised.

There are about 40,000 drug stores in the United States, and probably about 130,000 persons employed in selling medicines in these 40,000 stores. These 130,000 persons are called druggists, pharmacists, and chemists, without distinction. They are recruited largely by the employment of boys from thirteen to sixteen years of age, who have not even finished the studies of the common grammar schools, and w never again devote any time to study. Our present pharmacy laws are so framed and administered that no distinction whatever is made between the 40,000 proprietors of these drug stores. All must be "registered pharmacists," all must comply with the same standard of qualifications, and hence that standard must of necessity be no higher than that which can be readily enforced under such conditions. In many States, too, no higher qualifications are required of proprietors and managers than of clerks. In many States where the law has provided for two grades of pharmacists (?), all the candidates for licences are nevertheless given precisely the same questions in the public examinations, no other distinction being made than this, that, in order to become a "registered pharmacist," the candidate must be able to answer correctly a greater proportion of the questions than he is expected to answer if he is to become a "registered assistant pharmacist." Not one of the pharmacy laws makes the slightest reference to any standard of general or preparatory education; in fact, not one of them requires any evidence of education of any kind. All that is necessary is the ability to answer a sufficient proportion of the questions asked. That these questions are generally mere memory tests is natural. In other words, our pharmacy laws distinctly encourage cramming and discourage education. In seven States a boy of eighteen years, who can cram successfully enough to answer the required number of questions, is then licensed as a full-fledged "registered pharmacist," and may at once open and conduct a "pharmacy." (?) on his own account. In some States neither practical experience in drug stores, nor any other kind of practical training is necessary; it is enough to answer 50 or 75 per cent. of a lot of worn-out stock questions. Not one of the pharmacy laws affords any hint as to what the candidate is expected to know, what kind of preparation he ought to make for his "profession," or the scope covered by the examination; and the State Boards of Pharmacy are as silent as the laws on that subject. This failure to fix upon some standard of knowledge, and to publish the requirements, is peculiar to our country. The responsibility for this condition of things does not rest upon the State Boards of Pharmacy. It is the net result of conflicting opinions and interests. The pharmacy laws have largely been written, amended, and "put through" in the usual way—on the principle that anything is better than nothing. Tradition has buried reason. We have got into a rut—a Rip Van Winkle sleep.—*Apothecary.*

(*To be continued.*)

### EXPORT TRADE OF SUAKIN in 1893.

Gum takes the chief place in the table of exports, showing a total value of £56,855 as against £43,796 for the year 1892. It appears, however, that it was not a profitable season, as prices in Europe were uniformly low. The greater part of the gum was purchased here on commission, the merchants having lost too heavily in 1892 to risk their capital again by purchasing on their own account. Very little business was done in senna, the amount exported being about one-half of that shown in my last report.—*Consular Report.*

## CHEMISTS AND PATENT MEDICINE VENDORS.

The opinions expressed by the lay press in regard to the various questions which have been before the law courts as to the construction and operation of the Pharmacy Act are only second in importance to the corresponding judicial decisions, and in many instances they are significant in manifesting more correct appreciation of the real object and intention of the Act than has hitherto been the case.

The *Oldham Standard*, in referring to the recent prosecutions of local chemists (see *Pharm. Journ.*, pp. 1041 and 1059), comments on the proceedings as follows:—

"The Patent Medicine Vendors' Defence Association profess to be acting *pro bono publico* in prosecuting chemists for breaches of technical points in the law regulating the sale of poisons. But while crediting them with all the good intentions they may lay claim to, the public cannot overlook the fact that if patent medicine vendors had not been prevented from selling poisonous preparations, as unlicensed persons, there probably would have been no prosecution of chemists, who are duly licensed to sell poisonous as well as non-poisonous drugs. We may, therefore, regard the recent cases of prosecution in Oldham in the light of a reprisal; the patent medicine dealers, finding their occupation gone, have harked back upon the chemists to wreak a weak revenge by compelling them to sell poisons and poisonous preparations in accordance with the strict letter of the law.

"The law is naturally very suspicious of interested prosecutors of this class, and their *locus standi* in a court of justice might be fairly questioned. However, the Oldham cases were fought out on their merits before the magistrates, who have given their decision with a sole regard to the proper administration of the Pharmacy Act. The result, of course, leaves the right of chemists to sell poisons and their preparations unchallenged, only they must be more careful about labels and the name and address of the purchaser—small matters really for so great a fuss.

"It would not interest the public to know how mixed the law is on the subject of poisons and poisonous preparations, but this much may be said by way of illustration, that what the law prevents the chemist from doing with his right hand, he can do with impunity with his left. On the same shelf in the chemist's shop there might be two 'preparations' of poisons, one scheduled dangerous, the other not, though quite as dangerous if incautiously used.

"A more distinct classification would be considered a boon by every qualified chemist, but as regards the sale of poisons or poisonous preparations—the nostrums of the kingdom of quackery—by unlicensed persons, whether patent medicine vendors or herbalists, the public will not suffer in any way by their being put out of court. The Pharmacy Act is none the worse for being founded on the principle that 'children and fools should not play with edged tools.' The existence of the Pharmaceutical Society is a Government guarantee that the minutiæ of the Act will be carried out without the interference of unauthorised outsiders."

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

*SATURDAY, JUNE 23, 1894.*

*Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the* EDITOR, *17, Bloomsbury Square, London, W.C.*

*Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to* MR. RICHARD BREMRIDGE, *Secretary, 16, Bloomsbury Square, London, W.C.*

*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## THE PRIVILEGES AND OBLIGATIONS OF CHEMISTS AND DRUGGISTS.

ALTHOUGH the Pharmacy Acts have been generally and very properly regarded as measures intended especially for the benefit of the public, their intended and actual operation in other respects requires to be considered at the present time. The Act of 1852, though limited in its scope—having for its immediate objects only the protection of the title of pharmaceutical chemist and the confirmation of the Society's charter of incorporation—was the means of establishing, by voluntary action, a class of competent pharmacists, and of promoting the educational training of persons desirous of carrying on the business of compounding and dispensing medicine. It had the effect of thus creating the nucleus of a body, the members of which possessed that competent practical knowledge which was held to be requisite for the exercise of their business, and expedient for the safety of the public. The limitation of the powers conferred by that Act confined its operation to those who voluntarily conformed to its provisions; but the Act had the effect of placing the business of pharmaceutical chemist under such restrictions, that it could be carried on, under that designation, only by those who conformed with the provisions of the Act. The service thus rendered in advancing the practice of pharmacy and the position of those engaged in it has been abundantly recognised by the medical profession and by departments of the State. The practical advantage to pharmaceutical chemists of the qualification associated with the restriction imposed by the Act was also shown when exemption from jury service was accorded to pharmaceutical chemists, as constituting a body recognisable for that purpose by Parliament. But the influence of this Act did not extend to more than a small proportion of those carrying on the business of chemists and druggists throughout the country. The object of uniting them in one recognised and qualified body was not accomplished until the more comprehensive Act of 1868 was passed, and the exercise of the business of chemist and druggist was thereby subjected to restriction similar to that imposed in the case of pharmaceutical chemists, but of a compulsory nature.

The chemists and druggists of this country having been, since the passing of the Pharmacy Act of 1868, recognised by the State as persons lawfully entitled to sell, compound, and dispense poisons in virtue of a registration which has now become evidence of technical competence, they are, from that point of view alone, fully justified in asserting their claim to have the performance of those duties left entirely in their hands. The grounds upon which that view of the subject can be maintained are various. In the first place, the business of a chemist and druggist cannot now be entered upon by any individual who has a desire to follow it. For that purpose it is necessary to comply with conditions imposed by the State out of regard for the interests of the general public. Those conditions involve a limitation of the liberty of the subject, and they necessitate educational training, for which a corresponding expenditure of time, money, and exertion is requisite for those who desire to carry on the business of a chemist and druggist. The exercise of the business being thus subjected to restrictions, it is reasonable and fair that those restrictions should carry with them consequences operating to the advantage of legally qualified persons; that, in short, those who have complied with the required conditions of entering upon the business should not find themselves supplanted by others who have not done so. It is not necessary in this respect to consider the object with which the exercise of the business of a chemist and druggist has been subjected to restriction, as we are now dealing only with the fact that there is such a restriction. Neither is it necessary to take account of the circumstance that, in its effects, the restriction would operate beneficially for those who have acquired the qualification to carry on the business. That should be a natural consequence of compliance with the statutory requirements, and cannot in any sense be regarded as an undue advantage.

But the Act of 1868, besides conferring advantages, also entails upon registered chemists and druggists obligations which must necessarily be fulfilled, and it is to these obligations that we desire to direct attention. The right to sell poisons to keep open shop for retailing, compounding, or dispensing them, and to use the designation of chemist and druggist, is accompanied by the obligation to conform with regulations as to the keeping or selling of poisons, made in pursuance of the Act, to compound medicines of the British Pharmacopœia in accordance with the formulæ of that authority, and to observe the provisions of the 17th section of the Act in regard to all sales of poison. These are obligations expressly stated in the Act, and provision is made for the infliction of penalties in the event of any one of them being neglected. It is also an obligation of every registered chemist to respect and uphold the qualification in virtue of which the body he belongs to occupies a privileged position. In regard to the provisions of the 17th section, it is undeniable that in some cases, and owing to various conditions, there has been great laxity, which will require to be remedied in order that chemists and druggists may be enabled to justify and maintain their claim of being privileged under the Act as the legal vendors of articles to which it relates. The privilege by which they are distinguished from other traders is that of observing the statutory provisions which none but registered chemists are entitled to carry out. An attempt is now being made avowedly with the object of producing evidence that, in respect to observance of the provisions of the 17th section of the Act, registered chemists are no better than unqualified persons who have no right to sell the articles to which those provisions relate. In connection with this subject careful attention should be given to the very emphatic remarks made by the PRESIDENT of the Society at the Annual Meeting. It is not, however, only on the ground of duty in regard to the public that strict observance of statutory requirements is necessary, but also because the general interests of the craft would be damaged by their neglect by individuals.

It is this aspect of the matter to which we now desire especially to direct attention. Great as the obligation of chemists to the public unquestionably is, the duty they owe to their own craft is no less imperative. The unworthy motive of the attempt now being made is sufficiently apparent; but if it could be shown that some chemists are remiss in the fulfilment of their duty, a plausible pretext might be furnished for a continuance of the unlawful practices which have long been a just ground of complaint. Moreover, the endeavours to put a stop to those practices might be proportionately hindered or even rendered abortive. In the case of proprietary articles and secret remedies, observance of the law is rendered especially difficult, since chemists are under the disadvantage of being called upon to supply articles for which a demand has been created independently of themselves. But in the position occupied by the chemist and druggist he has no right to sell any such article unless he ascertains what it consists of, and if it be an article coming within the provisions of the Statute, the only course open to him in selling it is to comply with those provisions. In other instances his duty is still more clearly evident, and the protectio of the position occupied by chemists and druggists in that respect under the Pharmacy Act depends upon the integrity with which that duty is performed. The smaller section of the body which constitutes the Pharmaceutical Society is now engaged in the work of defending that position and enforcing the law against offenders. The success of that work would benefit all registered chemists, and in every sense the obligation lies upon them not to place obstacles in the way of its attainment.

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## W. D. SAVAGE.

AT the moment of going to press we have received intimation of the death of an old and valued member of the Society, in the person of W. D. SAVAGE, J.P., of Brighton, a former member and Vice-President of the Council. A brief obituary notice appears at page 1081.

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## THE ETHICS OF PATENT MEDICINE VENDORS.

A CIRCULAR being issued by the Patent Medicine Vendors' Defence Association affords strong presumptive evidence of what might be compared to an attempt to compound felony. In this suggestive production it is stated that the attitude of the Pharmaceutical Society having, in the unanimous opinion of the Executive Committee of the Association, "been most oppressive and unfair in their attempt to construct (*sic*) the Pharmacy Act to suit their requirements, and to obtain a monopoly of what they are not entitled to, viz., the sale of proprietary medicines, which have hitherto been sold by dealers for upwards of a quarter of a century," the Committee has "resolved to vigorously enforce the Pharmacy Act upon chemists, and to see they carry out the law (according to the dictum of the Pharmaceutical Society) to the vary utmost, and to prosecute all chemists who violate the laws regulating the sale of poisons."

Temptation is then placed in the path of erring chemists and druggists, who are promised exemption from the wrath to come on strictly business terms. For they are informed that the Committee, having the support of many, and the sympathy o hundreds, of chemists in thus fighting for wha are considered to be the rights of unqualified patent medicine vendors, and "retaliating agains the pharmaceuticalites," has resolved to give such chemists who side with this movement the opportunity of becoming members of the Associatio for which an annual subscription of not less tha 10*s*. 6*d*. is required, payable to Mr. JAMES LEGGE the Secretary, who will forward acknowledgment o the same. In consideration of this, all such chemists who join "will not be interfered with, but left for the Pharmaceutical Society to look after (i they think fit?)," but the Committee will expec information from them respecting any chemist who is infringing the Pharmacy or Arsenic Acts, o illegally trading in any way, and any chemist wh is not on the Association's register will be considered antagonistic to the object it has in vie The circular then states that "Our Commi would be sorry to prosecute any chemist who is favour of repealing the Statute, and they cons this method of giving them the opportunity to j our society the only way of testing their feeling on the subject and exonerating themselves from prosecution. Names of subscribers are not published in any way. Chemists who wish to become members should kindly remit within seven days, to enable us to entirely complete registration." Here, therefore, the position suggested by the *Oldham Standard* (see *Ph. J.*, p. 1070) is openly and shamelessly avowed.

As that paper remarks, the law is naturally very suspicious of interested prosecutors, and the only possible result of the recent cases at Oldham and elsewhere will be that chemists will require to be more careful regarding certain minor points —an eminently desirable consummation. The incidence and scope of the Pharmacy Act will not be in any appreciable degree, if at all, affected, and the Act "is none the worse for being founded on the principle that 'children and fools should not play with edged tools.'" The existence of the Pharmaceutical Society, our contemporary very properly points out, "is a Government guarantee that the minutiæ of the Act will be carried out without the interference of unauthorised outsiders."

## INTERNATIONAL CONGRESS OF APPLIED CHEMISTRY.

This Congress will open at Brussels on August 4 next, under the patronage of the King of the Belgians, and we are asked to announce that the Committee of Organisation will be glad to receive the names of delegates who expect to attend the meeting. The Central Committee of the Belgian Association of Chemists proposes at this meeting to suggest to the representatives of the various scientific societies and periodicals who may be present the advisability of taking steps to facilitate speedy access by specialists and technicists to all publications in which they are interested. The business of the Congress proper will be divided amongst four sections, dealing respectively with (A) sugar-making, (B) agricultural chemistry, (C) food-stuffs and public hygiene, and (D) biological chemistry. The proceedings will be inaugurated by a banquet on Saturday, August 4; on the Sunday visits to places of interest in Brussels will be followed by a picnic in the Bois de la Cambre; and the business proceedings on the four following days will be supplemented by visits to various institutions, factories, etc. On Friday, Antwerp and its exhibition will form the centres of interest; and on Saturday, August 11, the final meeting of the Congress, in the exhibition hall at Antwerp, will precede an excursion by water to Burght. Altogether a very attractive programme is offered for the delectation of visitors. The general secretaries of the Committee of Organisation are MM. F. Sachs (rue d'Allemagne, 68, Bruxelles) and H. Van Laer (rue de Hollande, 15, Bruxelles).

## CHEMICAL INVESTIGATION OF RHUBARB.

Dr. Hesse writes in reference to the list of subjects for investigation issued by the Executive Committee of the Pharmaceutical Conference (see *ante*, p. 1009), that he is engaged in the examination of rhubarb, with the view of determining the nature of its active constituents and in pursuance of experiments which have been in progress for some considerable time. In view of the question No. 7 in the Conference list he is desirous to make this fact known, in order to obviate the possibility of the work being simultaneously undertaken by others. In the course of an investigation of various lichens, Dr. Hesse has ascertained that the chrysophanic acid existing in *Parmelia parietina* is a substance entirely different from that existing in rhubarb, and he has thus been led to perceive the necessity of further investigation of rhubarb. We also learn from Dr. Hesse that he is still engaged with the investigation of cotoin and the substances associated with it in true coto bark. Further, that he has obtained another alkaloid from opium.

## "AN IMPROVED MEDICINAL MIXTURE."

Under the above title, a complete specification (No. 4753 of 1894) has been accepted by the Patent Office authorities, the inventor's claim being therein declared as follows:—

> "An improved mixture for the cure of catarrh, consisting of snuff, finely powdered chloride of lime, and ground cinnamon for the correction of the chloride, in about the proportions stated.
>
> "The proportions found favourable are as follows:—One ounce of snuff, one full teaspoonful of chloride of lime, and about ½ teaspoonful of cinnamon. This mixture, when inhaled in the ordinary manner, will rapidly relieve the complaint."

Comment on the above appears superfluous, but it affords a useful instance of the curiosities and absurdities of the Patent Office system.

## HERBARIUM PRIZE.

Intending competitors for the silver medal annually offered by the Council of the Pharmaceutical Society, for the best herbarium collected between the first day of January in one year and the first day of July in the year following, are reminded that the collections should be received by the Secretary of the Society not later than Monday, July 2 next. The plants may be collected in any part of the United Kingdom, the Channel Islands, or the Isle of Man, and competitors must be subscribing "Students" of the Society, under twenty-one years of age. Further particulars will be found in the Society's Calendar.

## VIIIth INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

We are asked to announce that a British Committee, of which Sir Douglas Galton, K.C.B., F.R.S., is the Chairman, and Professor W. H. Corfield, M.A., M.D. (Oxon.), is the Treasurer, has been formed to further the interests in this country of the Eighth International Congress of Hygiene and Demography, which is to be held in Budapest, from September 1 to 8, this year. Any information about the Congress may be obtained from the Hon. Secretary, Dr. Paul F. Moline, 42, Walton Street, Chelsea, S.W.

## ROYAL SOCIETY ELECTION.

At the annual meeting for the election of Fellows into the Royal Society, on Thursday, June 7, Mr. Joseph Wilson Swan, the noted electrician, who is also a member of the Pharmaceutical Society, was amongst those upon whom the honour was conferred.

# Proceedings of Societies in London.

## SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, June 14, Mr. T. Tickle, Vice-President, in the chair. A paper on "Early Chemistry" was read by Mr. H. Burrows, who gave some interesting descriptions of the views prevailing at different periods from about B.C. 1000 to about a hundred years ago. It was followed by a discussion, in which the Chairman, Messrs. Henry, Lander, Hill, and the Secretary took part.

In the absence of the author, the Secretary then read the following:—

### REPORT ON INORGANIC CHEMISTRY.

BY H. GARNETT.

### *A supposed New Element.*

Dr. K. J. Bayer (*Chemiker Zeitung*) describes the properties of a substance not possessing the reactions of any known element; it apparently exists in the state of an acid oxide. He obtained it from the mineral French bauxite, which was ignited with alkali, the new substance being present in the portion soluble in water. After separation of aluminium, vanadium, and chromium, it was isolated as a yellowish-brown powder, infusible, soluble in water, and forming, with alkalies, soluble salts varying in colour from pale yellow to olive-brown. In strong solutions of the ammonium salt $BaCl_2$ gave a yellowish-green precipitate, soluble in acids. Mercurous solutions gave a pale, straw-coloured precipitate, soluble in nitric acid, and yielding on evaporation warty crystals. Argentic nitrate gave a greenish precipitate, soluble in ammonia and in nitric acid; the silver salt could be crystallised from ammoniacal solutions.

Magnesia mixture gave, after a time, a green crystalline precipitate, soluble in acids. By means of this precipitant almost the whole of the substance can be removed from solution. Molybdate gives in nitric acid solutions a whitish precipitate when warmed, but the precipitation is not complete. Sulphuretted hydrogen converts it into the corresponding sulpho-salt of an intense red colour. In this solution acids precipitate a rusty brown sulphide, but precipitation is incomplete, the filtrate being of a violet colour, and presumably containing the element in a lower state of oxidation. In acid solutions sulphuretted hydrogen gives no precipitate, but the substance is reduced, yielding the violet coloured solution mentioned above. On evaporation and exposure, oxygen is absorbed, and the solution becomes yellow again. The substance is distinguished from vanadium by the fact that hydrogen peroxide causes no change of colour or precipitate in either acid or alkaline solutions, and from vanadium and molybdenum by yielding no precipitate or change of colour with potassium ferrocyanide.

When ignited with excess of ammonium chloride the substance is partly volatilised as a yellow soluble chloride. No further information regarding the supposed new element is given by the author, either of its atomic weight or of its position in the periodic table of the elements, owing to scarcity of material. The question, however, is being further investigated.

### *Recent Work on the Alkali Metals.*

*Oxides of the Alkali Metals.*—Berzelius has stated the existence of an oxide of potassium having the formula $K_4O$, but other workers have failed to obtain it by his method (the action of a limited amount of air on the metal). The oxide, $K_2O$, is also described by Berzelius and by Gmelin. Of higher oxides, $K_2O_2$, $K_2O_3$, and $K_2O_4$ have been stated to exist by various workers. As the mode of the formation and the properties of these various bodies seemed somewhat uncertain, the whole work has been repeated and the results revised by W. Holt and W. E. Sims (*Journ. Chem. Soc.*, ccclxxix., 432).

*Potassium.*—It was found that perfectly pure and dry oxygen has no action on this metal, which may be distilled unchanged in it. By using moderately dry air, however, under favourable conditions, with the aid of a gentle heat, oxidation proceeds regularly and apparently without a break till the oxide, $K_2O_4$, is reached. This oxide, on exposure to moist air, deliquesces and gives off oxygen, and $K_2O_3$ results. As the reaction was quantitative, the tetroxide can be analysed by measuring the oxygen liberated. The tetroxide is a bright, orange-yellow powder. No higher oxide can be formed, even when it is maintained for a long period at 200°–300° in a stream of oxygen. By the action of the theoretical quantity of nitrous oxide on potassium, $K_2O_3$ is formed. Exposure to air causes this oxide to pass into $K_2O_4$. $K_2O$ could not be formed or isolated under any conditions, either by the action of oxygen or of the oxides of nitrogen.

*Sodium.*—The same results were obtained with pure, dry oxygen as in the case of potassium—the metal is unattacked. No suboxide, $Na_4O$, can be formed under any conditions. On passing moderately dry air over sodium, the latter melts and then burns, forming (unlike potassium) the monoxide $Na_2O$; further heating in a current of oxygen results in the formation of the yellowish-white peroxide, $Na_2O_2$, but no higher oxide can be formed.

*Lithium* readily forms the oxide, $Li_2O$; traces only of a peroxide could be obtained.

The general conclusions arrived at are that the most stable and definite oxides of the alkali metals are:—$K_2O_4$, $Na_2O_2$, and $Li_2O$, while there also exist $K_2O_2$, $K_2O_3$, and $Na_2O$.

*Amides of the Alkali Metals.*—These bodies were first discovered and described by Gay Lussac and Thénard, and by Sir H. Davy, but the exact conditions of their production, their number and composition, have not been fully studied. The subject is further elucidated in a paper by A. W. Titherley (*Journ. Chem. Soc.*, ccclxxix., 504); he obtained the following results. By the action of dry ammonia gas on metallic sodium contained in glass or iron retorts heated to about 300° the following reaction occurred:—

$$2Na + 2NH_3 = 2NaNH_2 + H_2.$$

The resulting sodamide was white and waxy in appearance; its composition was ascertained by noting the gain in weight under this treatment of a known weight of sodium, also by measuring the hydrogen evolved. During the preparation of this body a part sublimed and was obtained in white transparent crystals. According to the statements of the text-books there exist also disodimide ($Na_2HN$) and sodium nitride ($Na_3N$), but their non-existence has been proved by the present worker. On strongly heating sodamide it was found not to split up, as alleged, into sodium nitride and ammonia, but simply into its elements. It was ascertained, too, that when ammonia gas is passed over sodamide heated to dull redness, the ammonia is continuously decomposed into its elements, nitrogen and hydrogen; the amide is split up into nitrogen, hydrogen, and sodium, the sodium in presence of ammonia again forms sodamide, which is decomposed as before. In this way a very small quantity of amide will decompose an unlimited supply of ammonia. Neither disodimide nor sodium nitride could be obtained by the action of metallic sodium on $NaNH_2$. By the action of ammonia on sodium oxide only a mixture of hydrate and amide resulted; thus:—

$$Na_2O + 2NH_3 = 2NaNH_2 + H_2O.$$

*Potassamide.*—This was prepared in the same manner as sodamide, and closely resembled the latter in general appearance and properties. Sir H. Davy considered that he had proved the formation of potassium nitride ($K_3N$) from this body by the action of heat; the nitride he stated to be a black infusible solid, and it is described as such in most text-books. Titherley found that any action such as that described by Davy was probably due to the action of the silica or alumina in the glass or porcelain vessels employed, and he failed altogether to obtain a nitride or dipotassimide. By using a silver boat, he found that at a temperature of between 400° and 500° potassamide distilled with partial decomposition into its elements. When heated in a current of hydrogen it can be distilled unchanged.

Potassium nitride could not be produced by heating potassamide with potassium oxide, nor by the direct action of nitrogen on the metal.

*Lithamide.*—No experiments with ammonia and lithium had previously been recorded. Ammonia gas led over heated lithium forms lithamide, differing from the preceding amides in being of a more crystalline appearance, and in being only slowly decomposed by water and acids without energetic action. Its formula was shown to be $LiNH_2$. It was analysed by dissolving a known weight in water and estimating the amount of ammonia and lithium in the solution. When heated at 300°–400° with silica, sodamide and potassamide form chiefly silicate of the alkali metal and silicon nitride, the latter being obtained as a brown, amorphous powder. With boric anhydride analogous results were obtained, the equation being—

$$2NaNH_2 + B_2O_3 = 2BN + 2NaOH + H_2O.$$

The boron nitride occurred as an insoluble white powder when the fused mass was treated with water. With nitroxyl chloride the principal reaction is—

$$KNH_2 + NOCl = KCl + N_2 + H_2O,$$

the gas being passed over the amide gently warmed in a tube.

The report gave rise to a discussion, in which the Chairman, Messrs. Hill, Guyer, and Henry joined.

The meeting then adjourned.

## SOCIETY OF ARTS.

### SOME RECENT ADVANCES IN PHOTOGRAPHIC CHEMISTRY.*

BY CHAPMAN JONES.

Photography, as ordinarily practised, is an empirical art. Although it is founded upon, and intimately connected with, certain branches of chemistry and optics, very few photographers know anything of these sciences. The ordinary practitioner, whether amateur or professional, works entirely by rule of thumb, and is guided by tradition rather than by reason. It is natural, and perhaps necessary, that this should have been so at first, but it must be allowed that the sooner the art is put upon a sure foundation the better, though doubtless there will always remain some who will prefer the old ways.

There is now a larger amount of scientific work being done in connection with photography than heretofore, and I would suggest that the time has come when we should make a determined effort to get rid of uncertain and obscure processes in serious work. When one's only aim is amusement, then, of course, there must remain free liberty to follow any fancy, but for the production of valuable records of any sort, whether pictorial or otherwise, I think the time has come when photographers ought to avail themselves to the fullest extent of all the scientific knowledge at their disposal. Any who are unable to guide themselves should, as is usual in other industries, seek the advice of those who are able to give them assistance.

As an example of the disastrous effects of working in the dark, I may say that I have heard of photographers, both amateur and professional, who have many large and valuable negatives intensified by the mercury and silver cyanide process that have so much changed from their original condition as to cause grave anxiety. It would have been wise, though perhaps hardly possible, if photographers had declined to use this process until it had been properly investigated by a chemist. Then no trouble would have ensued.

We may for convenience sake, with reference to the majority of photographic operations, divide the photographer's work into two parts, namely, the making of the negative and the making of the print. If we except those cases in which, for scientific purposes, the negative itself is preserved as the record, as, for example, in spectrum work, then the end and aim of the photographer is the preparation of the print, and the negative is nothing more than the tool used in its production. In this sense, therefore, the print is of much more importance than the negative. It should be of a permanent character, while the tool used in the making of it may perfectly serve its purpose, though it were so short-lived as to fade away immediately after it had yielded the print. But it is convenient, and often of great importance from an industrial point of view, that the negative shall be stable. And if the negative is not right the print must be wrong, and if the negative is produced by uncertain processes, we never can tell what the print will be. The science of negative-making becomes therefore, I think, of as much importance as the science of printing processes. As the chemistry of these latter has received enough attention to enable anyone to make prints that are perfect from a chemical point of view, while the chemistry of negative-making has been very largely neglected, I have spent a good deal of time during the last few years in examining some of the operations in common use, and propose to look at one or two matters in connection with the chemistry of negative-making on gelatin plates.

The silver bromide particles held in the gelatine film are so changed by suitable exposure to light, that the developer is able to take away the bromine from them. In a chemically perfect negative, after fixing and washing, the image will consist of pure metallic silver, and it does not matter at all where the bromine has gone or what changes it has produced in the developer so long as no trace of it, or what it leads to, remains behind. But when bromine is added to an alkaline solution of pyrogallic acid, it produces a brown colour, and as there is most bromine removed where there is most silver deposited, the brown colouring matter will be, roughly speaking, proportional in quantity to the density of the negative, unless some of it is removed. There is, perhaps, no *primâ facie* reason why an image of this composite character should be objected to. Indeed, the presence of this brown stuff may improve the negative if the film has too little silver in it to give proper density alone, or if the exposure has been too short to change a sufficient amount of the silver bromide into the developable condition, or if the development has been unduly curtailed. It is easy to see, therefore, that a cheap manufacturer, and an incompetent, rule-of-thumb photographer, may have definite reason for advocating the use of stain-producing developers. But to rely upon staining matter in the making of negatives is to lean upon a broken reed. The residues obtained by the partial destruction of some complex organic substances are almost pitchy in character, and seem to be very unalterable by ordinary atmospheric influences. But the staining matter produced by the oxidation of developers, so far as I have yet discovered, is never of this kind. Pyrogallic acid generally yields brown products, inclining sometimes to red and sometimes to yellow; but twice I have obtained solutions of so fine a deep blue colour, that it might have been mistaken for Prussian blue. These blue colours, on standing for a few hours, faded to a yellowish-brown. The deep reddish-brown colour obtained by simple aerial oxidation of a solution of pyrogallic acid and sodium carbonate, becomes perceptibly lighter in a day or two when bottled up, and in a week or so may have lost perhaps half the depth of its colour. I think one is quite justified in saying that neither the quantity nor the quality of these staining matters can be controlled, that they are in every way uncertain, and that, therefore, they ought to be rigorously excluded, or perfectly removed, from every negative of value.

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* Read at a meeting of the Society on April 25.

And these are far from being all the reasons why the presence of staining matter in negatives should be avoided. A silver image is reliable, and can be chemically worked upon with perfect certainty as may be desired. But staining matter cannot form a foundation for after work, and it will suffer change with almost every operation upon the negative. Its colour will change and re-change, and by washing it will, under some circumstances, be partly removed. We know very well that when a part of the image is removed by applications to the surface of the film, the shadows lose a greater proportion of density than the lights because the dark detail is in the upper or outer service of the film only, and so is more easily attacked. Therefore, granting for the moment that a negative with an image that consists partly of staining matter has correct gradation, if a part of the staining matter is removed the gradation will be falsified, and this alone would be sufficient reason for condemning the use of staining matter in negative-making.

There is another source of staining matter, namely, the oxidation of the developer by its exposure to the air during development. The colouring matters so produced may or may not be the same as those resulting from the action of bromine, but, so far as my experiments go, they behave in a similar manner with reference to those changes that are of practical interest to photographers. The darkened solution will soak into the gelatin and colour it more or less uniformly, and it appears that it may perhaps also intensify the image by deposition upon it, if we take into account recently published experiments. Mr. A. W. Dolland* has shown how by the use of glycerin gold may be deposited upon the metal in a platinum print, the platinum apparently remaining quite unaffected, and merely determining by "contact action" the precipitation of the gold from a solution that is ready to deposit it upon the least disturbance. Mr. E. J. Wall† has confirmed the results of earlier workers, who found that silver might be similarly deposited. And, coming still more closely to the point under discussion, Dr. R. E. Liesegang‡ has recently observed that substances of the nature of pigments may be deposited upon a metallic basis in an analogous manner. He found that the staining matter produced by the aerial oxidation of pyrogallic acid, hydroquinone, and similar substances in alkaline solution, would deposit upon and intensify the image of a silver print. A solution of amidol with carbonate of soda he found would deposit coloured oxidation products upon the image of a platinum print. It is, therefore, but natural to suppose that probably sometimes the staining matters produced by aerial oxidation in developers will deposit upon the image in negatives, and add to the oxidation products that are already there, produced by the action of the bromine, as before described. I have made one experiment in this direction by soaking part of a negative in an alkaline solution of pyrogallic acid, allowing it to remain until the solution and the negative were both well coloured, and then washing for a short time. The colour, of course, retarded printing, but I could not discover any intensification effect. It is possible that the staining matter produced by aerial oxidation may attach itself more readily to the image when the image is freshly formed, or it may be that it does not attach itself to the image at all under the conditions which hold during development.

Every photographer knows how to set to work to avoid the production of staining matter, but I think that very few know how to get rid of it when it is in a negative. The usual method is to apply an acid solution—a so-called "clearing solution." The stain may disappear, and then the photographer imagines that it has gone. The error of this empirical and rule-of-thumb method can be easily demonstrated. If hydrochloric acid, sulphuric acid, sulphurous acid, or alum is added to an oxidised alkaline solution of pyrogallic acid, the brown colour is changed to a lighter brown, and immediately a yellowish insoluble matter begins to fall out of solution, and continues to increase in quantity for some considerable time. In a negative where there is not much stain this change of colour may cause it to disappear, and the superficial observer would then think that he had got rid of it, while really he had made it, or a large part of it, more permanent than before by rendering it insoluble. It is easily shown that this precipitated matter generally constitutes a very important part of the staining material, by dissolving it in sodium carbonate and comparing the colour so obtained with that of the original, or of the part not precipitated. Citric acid differs from the acids mentioned above, in that it gives no precipitate, but citric acid and alum together give a copious precipitate even when the quantity added is many times more than sufficient to render the solution strongly acid.

It appears, however, to be possible in aggravated cases to get a small residuum of stain from the use of pyrogallic acid, and rather more from the use of hydroquinone, which it is very difficult indeed, if not impossible, to remove. This residual stain I find to be quite unaffected in appearance by any of the usual clearing solutions, unless they contain iron, and then the colour is somewhat changed in tint, and, if anything, a little darkened. It may be remarked also that staining matters vary somewhat, and that exceptions may be found to the results that I have described, but I believe that such exceptions, if any exist, will be found so rarely, that it will be practically impossible to take cognisance of them in framing rules for general work. Ferrous oxalate has often been recommended as the most perfect developer when stainless negatives are desired, but although ferrous oxalate is a very useful reagent, I cannot confirm the superiority that is claimed for it. Every developer in use will give clean, greyish-black negatives if properly employed, but by making a careful comparison of ferrous oxalate with eikonogen on a plain gelatin film, I find the iron developer to leave a slight colour, which is very difficult, if at all possible, to remove, while the eikonogen leaves none. I have no doubt whatever that metol, amidol, and rodinal would all show a like, if not a more marked, superiority. It may be observed that in making such comparisons it is necessary to use a simple gelatin film, because the stain left by ferrous oxalate, when it is applied in the same manner as is usual in development, is easily masked; and it should be understood, too, that the difference is slight. Still, what difference there is, is in favour of the alkaline developer.

The rules for practical work that I have deduced from my experiments I have followed for some years with uniform success, nor have I ever heard of dissatisfaction from those who have accepted my suggestions in this matter. I believe that the greatest freedom from stains due to the developer is secured by the use of an alkaline developer with sufficient sulphite, and fixing in a solution of hyposulphite to which sodium sulphite and sodium carbonate have been added. A very few minutes' washing between development and fixing is sufficient, but the fixing solution should not be used after it gets dirty and discoloured. After thorough fixing should follow a thorough washing, and with a well-coated plate this will be a matter of two or three hours or more. By this method any staining matter is kept in its most conspicuous form, and in its soluble, and therefore most readily removable, condition; and it must surely be allowed that this is the right principle to work upon. Alum should never be used until the washing is finished, because it retards the washing; so-called "clearing solutions" should not be used, both because they tend to make the stain less obvious, and they make its removal impossible; acid fixing baths should be avoided for the same reasons, and if they harden the film their use is still more detrimental, because in doing so they render the washing more tedious or less perfect.

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* *Journal of the Photographic Society*, N.S., xviii., 189.

† *Journal of the Photographic Society*, N.S., xviii., 184.

‡ *Photographic Work*, iii., 121.

Having obtained a pure silver image, it may be found that its density is not suitable. It is well that the density should never be too great, because there is no practically useful method of reducing it that does not alter the gradation. On the other hand, intensification is certain and easy, and does not falsify the gradation when done in a suitable manner. In papers read before the Photographic Society and the Society of Chemical Industry, I have detailed the chemistry of mercurial intensification, and shown that ferrous oxalate is the only reagent that can be relied upon to follow mercuric chloride. Potassium silver cyanide is not suitable, because the image it gives is not of constant composition, and is not permanent; ammonia is unreliable, because it gives images of complex and varying composition which cannot reasonably be expected to be permanent; all simple alkalies are out of the question; sodium sulphite gives a pure metallic image, but in smaller quantity than the original image, and often, therefore, gives no intensification effect; sodium hyposulphite also gives an image containing a less weight of metal than the original, and, besides, is likely to give very complicated unstable images if used sparingly. Ferrous oxalate, on the other hand, is a perfect reagent, leaving every atom of silver in the original image with an atom of mercury added to it.

The most excellent point of this method of intensification is that, so far as I can discover, there is absolutely no loss of even the faintest detail, but a perfect and proportional action throughout. But this very excellence has proved a drawback in the hands of dirty workers, and workers with unclean plates. A silver stain will be intensified as well as the silver image, and must be so if the action is perfect. I know of no failure by this method not due to imperfect washing or other faulty work. But some photographers say they have found alkaline developers, or alkaline developers without the alkali (if the expression will pass), better than ferrous oxalate, and they have recommended these reagents, I am sorry to say, without a knowledge of their action. If they work, as they are stated to do, "cleaner" than ferrous oxalate, that is a pretty sure indication that they are less perfect, unless the only difference is due to the precipitation of the lime in the water when oxalate is used. I have tried many of these solutions, and none of them are reliable. By the use of them, mercury that ought to be in the image is lost, and one cannot tell how much mercury will be so lost, nor from what part of the image it will come. It is hardly conceivable that the mercury lost can come proportionately from every part of the image, and if the loss is not proportional throughout, the density gradation of the negative is upset.

Sodium sulphite, when applied alone, removes both silver and mercury from the bleached image, but with a developing agent, whether with or without alkali, I have never found any silver in the solution.

Eikonogen alone I found to act very slightly. With sulphite a great deal of mercury was lost. Eikonogen, 12 grains, sodium carbonate, 25 grains, and sodium sulphite, 25 grains, to water, 1 ounce, acted well, but 19 per cent. of the mercury was lost. Metol alone gave no perceptible action. Metol, 2 grains, sodium sulphite, 4 grains, to 1 ounce, acted well, but very much mercury was lost. Metol, 4 grains, sulphite and carbonate, 24 grains each, to 1 ounce, acted well, but 32 per cent. of the mercury was lost. Amidol, 2 grains, and sulphite, 20 grains to the ounce, worked well, and 10 per cent. of mercury was lost. This appeared hopeful, so I tried amidol, 8, and sulphite, 20, but this was useless, as its effect was very slight indeed within a reasonable time. So I diminished the amidol instead of increasing it, and tried amidol, 1, and sulphite, 20. This worked well, but 42 per cent. of the mercury was lost. On mixing the amidol and sulphite, sulphurous acid is set free. By adding ammonia to the mixture a blue colour appears when the alkali is in a little excess, and by adding ammonia in quantity, just insufficient to produce this colour, a solution may be prepared that will remain slightly alkaline throughout the reaction. Such a solution acts very energetically, but a very large quantity of mercury was dissolved by it. Pyrogallic acid, 3 grains, sodium sulphite, 8 grains, ammonia, 3 minims to the ounce, gave a loss of 29 per cent. of the mercury, and the solution was much more coloured than in any other case. Pyrogallic acid with sulphite slightly acidified was no better.

In some cases, as stated above, I have estimated the actual proportion of mercury in the solution, and therefore lost from the image, but these numbers must be taken as only giving a general idea of the amount. In some cases, by prolonging the action a little it would have been increased, and probably in no case would the same loss occur by repeating the experiment.

Thus I am obliged to come to the same conclusion now that I did when I first drew attention to the chemistry of mercurial intensification, namely, that ferrous oxalate is the only satisfactory reagent to follow the application of mercuric chloride. I show an example in which this method of intensification has been carried out on various parts of the same negative, once, twice, three times, and four times, without a suggestion of stain or trouble of any sort. It should be noted that this repeated application of the process is a very severe test of its cleanness when properly carried out. If there had been the slightest false deposit of mercury at any stage, this would have been doubled by the next treatment, and increased to four times and to eight times by successive treatments. Silver would have increased similarly, but to a still greater degree. I could show many negatives intensified by this process, but they are similar in appearance to unintensified negatives, and therefore would not be instructive.

There is only one other matter that I will refer to at present, and that but briefly, namely, the getting rid of the hyposulphite from the negative. Experience appears to indicate that if a negative is of a satisfactory density, the small amount of hyposulphite left in it after from two to four hours' washing does no harm. But if the negative is to be intensified, any hyposulphite will cause a precipitate of mercury salt and so give a false deposit. This would, as a rule, matter but little but for the fact that a gelatin negative is always difficult to wash evenly, and such a false deposit will, therefore, almost always occur in patches. If the gelatin film is of exactly the same thickness throughout, equal washing all over is difficult, but in most plates there are variations in the thickness of the film that make it impossible, unless it is so prolonged as to be practically perfect in the thickest parts. What we want is a reagent that will oxidise the small residue of hyposulphite into sulphate, which is quite inert, without affecting the image or attacking the gelatin. I do not know of any reagent that will do this. Peroxide of hydrogen, as described, appears to be excellent, the general idea being that it produces sodium sulphate and sulphuric acid from the remaining hyposulphite, but this is a mistake. It produces no acid, and only about one-third of the sulphur is oxidised to sulphate. By mixing sodium hyposulphite with a large excess of the peroxide, and allowing them to remain together for three days, less than half the sulphur was changed to sulphate, and whatever change had been produced it was of little, if any, use, for the solution still gave a precipitate with mercuric chloride. Peroxide of hydrogen appears, therefore, to be of no avail; but even it were, it would be a very unsafe reagent in the hands of ordinary photographers, because its strength is very liable to decline. It may in a few months be only one-tenth of its original strength, and a bottle freshly opened, though originally without doubt of full strength, may be found to contain only a third of the stated quantity; and these changes lead to no alteration in the appearance of the liquid, and can only be recognised by a direct test. These uncertainties render it of very little use in the hands of those who are unable to determine its strength. Alum and acids decompose sodium hyposulphite, but a mixture of alum and hydrochloric acid acts very slowly upon a weak solution of it, so slowly that one might be tempted to say that it also was useless. I find, however, that a fairly well washed negative is made more fit for intensification by treating it with an acid solution, or an acidified alum solution, and washing again, and I fancy that the improvement is not due merely to the extra washing that it gets. Whatever may be the actual change brought about by this treatment, I find that it is advantageous from a practical point of view, and that it is a desirable precaution to take.

# Scottish Transactions.

## EDINBURGH AND DISTRICT CHEMISTS' TRADE ASSOCIATION.

The first annual excursion of the Association took place to Norham Castle, near Berwick-on-Tweed, on Wednesday, June 13. Upwards of seventy members and their friends left the Waverley Station, Edinburgh, at 9.20 a.m., and travelled by the East Coast route to Berwick. Luncheon was served at the Red Lion Hotel. Thereafter the party drove in brakes to Norham Castle, along the Scottish side of the Tweed, a distance of eleven miles. At the village of Ladykirk a halt was made to inspect the ancient church built by James IV. of Scotland, and, including the roof, consisting entirely of stone. The church is associated with many traditions, and was described to the party by the Rev. Mr. Dobbie, minister of the parish. Arrived at the Castle about 2 p.m., the company was successfully photographed by two members of the Association. The return journey to Berwick was by the English side of the Tweed, passing Longridge Tower on the way. Dinner was served in the Red Lion Hotel at 5 p.m., when, in the absence of Mr. Boa, the chair was taken by the Vice-Chairman, Mr. J. Bowman, and Messrs. C. F. Henry and R. L. Hendry acted as croupiers. After dinner and the loyal toasts, Mr. J. Laidlaw Ewing proposed "Success to the Association," and Mr. Bowman replied; Mr. Noble proposed "The Ladies," and Mr. Rutherford Hill replied; Mr. McLaren proposed "The Visitors," and Messrs. Hutchinson, Berwick and Newbigging, Alnwick, replied. Mr. Forret proposed a vote of thanks to the Chairman, which was heartily awarded. Thereafter the company enjoyed a stroll through the ancient town, and left for Edinburgh at 7.16 p.m., where they arrived at 8.45 p.m. The weather, fortunately, was exceptionally fine, and the day's outing was thoroughly enjoyed. Much credit is due to Mr. Henry, the Secretary, and his committee for the success of the first excursion.

## EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The second botanical excursion took place on Wednesday, June 6, to Arthur Seat, starting from Holyrood Gate at 6 a.m. The party walked by St. Anthony's Chapel, over the Crow Hill, round by Dunsapie Loch, and home by the Gibbet Loan and Newington. Among the specimens collected were *Astragalus hypoglottis*, *Geranium sanguineum*, *G. molle*, *Helianthemum vulgare*, *Potentilla tormentilla*, *Ranunculus bulbosus*, and *Thymus serpyllum*. *Sambucus nigra* was not yet in flower, but was covered with numerous flower buds. *Ulex europæus* was one mass of yellow blooms, showing the same rich profusion of flowers that is so marked a feature in all flowering trees and shrubs this season.

# Provincial Transactions.

## NORTH OF ENGLAND INSTITUTE OF TECHNICAL BREWING.

### THE POLARISCOPE IN RELATION TO CHEMICAL CONSTITUTION.*

BY PERCY FRANKLAND, PH.D., B.SC. (LOND.), F.R.S.,
*Now Professor of Chemistry and Metallurgy at Mason's College, Birmingham.*

(*Continued from page* 972).

A circumstance which at once attracted the attention of chemists was the fact that all the ordinary active substances are obtained as the result of vital processes, either vegetable or animal; but that whenever a substance containing an asymmetric carbon atom, and therefore capable of exhibiting activity, is prepared artificially, it is invariably found to be inactive to polarised light. Thus, whilst the lactic acid found in muscular tissue is active and dextro-rotary, the lactic acid artificially prepared by chemical means in the laboratory is invariably inactive and without influence on the polarised beam. That the inactive form should be obtained by artificial means, or in other words that the same quantity of each of the oppositely active isomers should be produced, is indeed to be anticipated according to the theory of probabilities. For inasmuch as there is, as far as we know, no more reason for the one isomer to be formed than the other, it is obviously "level betting" whether any individual molecule of, say, lactic acid produced is dextro or lævo-rotary. So that in the production of what is practically an infinite number of lactic acid molecules, there will be an equal number of dextro- and lævo-rotary molecules, or in other words, the mixture of these oppositely active molecules will be inactive.

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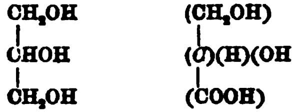
* Reprinted from the *Chemical News*.

Thus, again, in the artificial production of tartaric acid it is racemic acid which is formed, *i.e.*, a combination of equal parts of dextro- and lævo-tartaric acids.

If this theory be correct, it is obvious that by suitable means it should be possible to separate the active constituents of such an inactive mixture. The methods by which such inactive mixtures could be made to yield up their active components were already discovered by Pasteur many years ago; nor have any new methods been devised since, in spite of the numerous investigators who have devoted their attention to this matter.

The most important of these methods for decomposing such inactive combinations is a very remarkable one, depending upon the circumstance that if such a substance is attacked or fermented by micro-organisms, the latter almost invariably decompose one of the optical isomers by preference.

I will illustrate this method by means of an example which I discovered some years ago. One of the simplest substances containing an asymmetric carbon atom is glyceric acid, which is obtained by the oxidation of glycerin:—



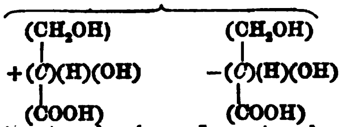
$$\begin{array}{cc} \mathrm{CH_2OH} & \mathrm{(CH_2OH)} \\ | & | \\ \mathrm{CHOH} & (\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ \mathrm{CH_2OH} & \mathrm{(COOH)} \end{array}$$

Glycerin. Glyceric acid.

When so prepared, however, this glyceric acid is invariably found to be wholly inactive towards polarised light.

Some years ago I found a micro-organism, a bacillus, which has the property of inducing a fermentative decomposition of glyceric acid, and on studying this fermentation attentively I found that only a part, roughly one-half, of the glyceric acid was destroyed by the bacillus and converted into other products, whilst the glyceric acid which remained undecomposed proved to be powerfully active, viz., dextrorotary. Thus the bacillus turned loose upon the inactive combination of the dextro- and lævo-rotary glyceric acids had singled out the lævo-rotary isomer for its destructive energies, and had left the dextrorotary isomer intact. Thus:—

*Inactive Glyceric Acid.*

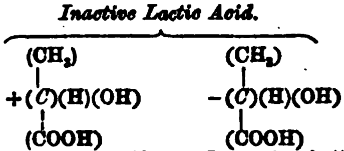


$$\overbrace{\begin{array}{cc} \mathrm{(CH_2OH)} & \mathrm{(CH_2OH)} \\ | & | \\ +(\mathit{C})\mathrm{(H)(OH)} & -(\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ \mathrm{(COOH)} & \mathrm{(COOH)} \end{array}}$$

Dextro-rotary glyceric acid, left intact by bacillus. Lævo-rotary glyceric acid, destroyed by bacillus.

In the same way I have, with Mr. MacGregor, quite recently obtained the dextro-lactic acid by the fermentation of ordinary inactive lactic acid with a suitable bacillus which decomposes the lævo-lactic acid by preference, thus:—

*Inactive Lactic Acid.*

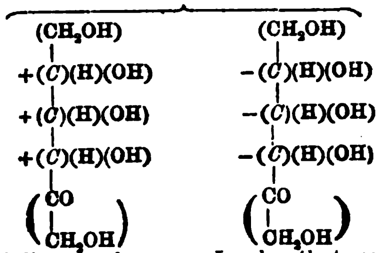


$$\overbrace{\begin{array}{cc} \mathrm{(CH_3)} & \mathrm{(CH_3)} \\ | & | \\ +(\mathit{C})\mathrm{(H)(OH)} & -(\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ \mathrm{(COOH)} & \mathrm{(COOH)} \end{array}}$$

Dextro-rotary lactic acid, remaining after fermentation. Lævo rotary lactic acid, destroyed by fermentation with the bacillus.

Another exceedingly interesting example of this power of micro-organisms to select one of two optically isomeric substances was furnished a few years ago by Emil Fischer in his classical researches on the sugars. Fischer succeeded in building up by artificial means in the laboratory a sugar which was only distinguishable from the well-known lævulose by the circumstance of its being inactive to light, whilst lævulose, as you are aware, and as its name implies, turns the plane of polarisation powerfully to the left. To this inactive artificial sugar he gave the name of "fructose." On fermenting this with brewers' yeast, he found that only one-half of it was destroyed by the latter, with formation of alcohol and carbonic anhydride, and that the residual half was now powerfully active to light, turning the plane of polarisation through exactly the same angle to the right that ordinary lævulose does to the left. The following formulæ will render this apparent:—

*Inactive Fructose.*



$$\overbrace{\begin{array}{cc} \mathrm{(CH_2OH)} & \mathrm{(CH_2OH)} \\ | & | \\ +(\mathit{C})\mathrm{(H)(OH)} & -(\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ +(\mathit{C})\mathrm{(H)(OH)} & -(\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ +(\mathit{C})\mathrm{(H)(OH)} & -(\mathit{C})\mathrm{(H)(OH)} \\ | & | \\ \left(\begin{array}{c}\mathrm{CO} \\ | \\ \mathrm{CH_2OH}\end{array}\right) & \left(\begin{array}{c}\mathrm{CO} \\ | \\ \mathrm{CH_2OH}\end{array}\right) \end{array}}$$

Ordinary lævulose (lævo-rotary) destroyed by fermentation with brewers' yeast. Lævulose (dextro-rotary) not fermented by brewers' yeast.

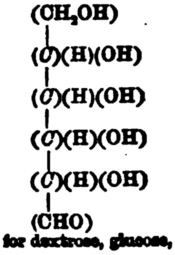
Thus the brewers' yeast selects for fermentation that form of lævulose which occurs in nature, and leaves that untouched which, as far as we know, is only an artificial laboratory product.

Having thus referred to these beautiful researches of Emil Fischer on the sugars, I should point out that they could not possibly have been carried on without the assistance of the theory of the asymmetric carbon atom, which has served as the guiding compass throughout Fischer's investigations.

The application of the asymmetric carbon atom to the series of sugar compounds is of so much theoretical interest to brewers that I will venture to say a few words more on the subject.

Nothing is better calculated indeed to demonstrate the value and importance of theory and of purely scientific investigation than the manner in which the theory of the asymmetric carbon atom has, in the hands of Emil Fischer, led not only to a complete elucidation of the relationship subsisting between the various sugars, but even to the successful artificial production in the laboratory of the three principal representatives of the sugar group, viz., dextrose, lævulose, and galactose, substances which are of such fundamental importance in the vital phenomena both of the animal and vegetable kingdoms, and have been so extensively employed in some of the largest industries created by man.

Of the constitution of lævulose I have already spoken, and I will now refer only to the still more important dextrose, glucose, or grape-sugar, as it is variously denominated. The chemical constitution of this substance was proved by Kiliani, now about eight years ago, to be capable of representation by the following formula:—



$$\begin{array}{c} \mathrm{(CH_2OH)} \\ | \\ (\mathit{C})\mathrm{(H)(OH)} \\ | \\ (\mathit{C})\mathrm{(H)(OH)} \\ | \\ (\mathit{C})\mathrm{(H)(OH)} \\ | \\ (\mathit{C})\mathrm{(H)(OH)} \\ | \\ \mathrm{(CHO)} \end{array}$$

Kiliani's formula for dextrose, glucose, or grape-sugar.

By applying our asymmetric carbon-atom theory to this formula we are able to predict a number of important points connected with this substance.

Thus it is at once apparent that four out of the six atoms of carbon which it contains are asymmetric, *i.e.*, each attached to four different groups. The four groups attached to each of these asymmetric carbon atoms can, as we have seen, be arranged in two different ways, to which we will give the sign + and − respectively, and on carefully examining the formula it will be seen that no less than sixteen different arrangements in all can be constructed, thus :—

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| + | + | − | − |
| + | − | + | − |
| + | − | + | − |
| + | + | − | − |

| 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|
| + | + | + | + | + | − |
| + | + | + | − | − | + |
| + | − | − | + | − | − |
| − | + | − | − | − | − |

| 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|
| − | + | − | − | − | − |
| + | − | − | + | − | − |
| + | + | + | − | − | + |
| + | + | + | + | + | − |

Our theory enables us, therefore, to predict the existence of no less than sixteen different modifications of grape-sugar. It enables us, moreover, to predict a number of other relationships subsisting between these isomeric modifications; thus of equal but opposite activity towards polarised light should be—

| | | | |
|---|---|---|---|
| 1, 4 | 5, 15 | 6, 16 | 7, 13 |
| 2, 3 | 11, 9 | 12, 10 | 8, 14 |

or in other words, there should be eight different types of glucose, each of which should exist in a left-handed and a right-handed modification respectively; whilst again by combining equal parts of 1 and 4, 5 and 15, 6 and 16, 7 and 13, 2 and 3, 11 and 9, 12 and 10, 8 and 14 respectively, we should obtain eight different types of glucose, each, however, inactive to polarised light.

Thus in all there should be twenty-four isomeric glucoses, sixteen active and eight inactive, the latter each composed of equal parts of equally, but oppositely, active isomers.

Although by chemical research only some of these substances have been hitherto obtained, yet there can be but little doubt that their preparation is only a matter of time, for in whatever direction the theory has been tested, it has not been found wanting.

Thus already now we are acquainted with no less than five different types of glucose, viz. :—

| | |
|---|---|
| Mannose... ... ... | Dextro.<br>Lævo.<br>Inactive. |
| Glucose proper ... | Dextro.<br>Lævo.<br>Inactive. |
| Gulose ... ... ... | Dextro.<br>Lævo.<br>Inactive. |
| Galactose ... ... | Dextro.<br>Lævo.<br>Inactive. |
| Talose ... ... ... | — |

or in all, therefore, thirteen out of the twenty-four isomers predicted.

*(To be continued.)*

# Parliamentary and Law Proceedings.

## PROCEEDINGS UNDER THE DENTAL ACTS.

At Lancaster, on Saturday, June 9, Robert Knowles, chemist, of Morecambe, was summoned at the instance of the British Dental Association for practising as a dentist without being registered. Mr. Turner, London, prosecuted, and Mr. Tilly defended. Mr. Knowles recently took over the business of Mr. Cutts, dentist, and in his window was an advertisement "Teeth extracted," on the floor was a mat with the word "Dentist" upon it, which word was still legible, though the mat was turned wrong side up; and he also inserted advertisements in a local paper calling attention to the dental portion of his business, but omitting all reference to his chemist's business. The defence was that there was no intention to break the law, that the defendant had taken down all references to surgeon-dentistry which his predecessor had exhibited, that he had a perfect right to extract teeth and manufacture false ones if anyone would employ him, and that the word "dentist" was practically illegible when it was put the wrong side up. The magistrates inflicted a penalty of £1 and costs, 12*s*. 6*d*. on one charge only, a second being dismissed.—*Liverpool Courier*.

## POISONING CASES AND INQUESTS.

### Poisoning by Opium.

On June 19, Mr. J. E. Bush, borough coroner, held an inquest at the Canteen public-house, Glo'ster Road, Brighton, on the body of Walter Frederic Conway, late of 21, Glo'ster St. The deceased had been ill and under medical treatment on and off for two years or more, and had been low spirited. On the Sunday night the deceased went to bed about ten, and about four o'clock next morning an unsuccessful attempt was made to wake him. He had been in the habit of taking chlorodyne to induce sleep. Mr. C. Jacomb Hood, M.R.C.S., said he had attended deceased for two years. He was suffering from enlargement of the spleen, and had a great deal of sleeplessness. When witness arrived on Monday morning he was in the last stage, and though an injection under the skin was made it was without effect. Death was due to opium poisoning. The glass produced contained liquid opium. The dose which deceased had taken would be the more likely to be fatal considering the state of his health at the time. The verdict of the jury was "Death by misadventure."—*Sussex Daily News*.

### Suicide of a Chemist.

On June 13, at the Islington Coroner's Court, Dr. Danford Thomas held an inquiry concerning the death of Osborn Bellars, aged 59, a chemist, lately residing at Poplar House, High Street, Leyton.

Dr. Wickham, of 1, Westbourne Road, deposed to being called to see deceased, and finding him dead. On making a *post-mortem* examination, he found all the organs healthy. There was no disease to account for death, and he was of opinion that deceased had died from poison. The solution in the bottle, he thought, was ferri-cyanide of potassium.

The Coroner: Have you opened the stomach?

Witness: No, I have not.

The coroner: You had better do so.

The doctor, having examined the contents of the stomach, said there was no smell of the poison in the stomach, but a certain amount of congestion. There was no evidence of an irritant poison, but he was of opinion that death was due to poison.

The jury returned a verdict of "Suicide whilst of unsound mind."—*Islington Gazette*.

## Reviews and Notices of Books.

THE TANNINS: A MONOGRAPH ON THE HISTORY, PREPARATION, PROPERTIES, METHODS OF ESTIMATION, AND USES OF THE VEGETABLE ASTRINGENTS. WITH AN INDEX TO THE LITERATURE OF THE SUBJECT. By HENRY TRIMBLE, PH.M., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Vol. II. Pp. 172. (Philadelphia J. B. Lippincott Company. 1894.)

In the first volume of this work, a notice of which appeared in the *Pharmaceutical Journal*, vol. li., 1077, the tannins were treated of as a class, and the tannin of nutgalls was specially discussed as having been more exactly investigated than any other. The present volume extends the consideration of this subject to other kinds of tannin, which may or may not be identical with that of nutgalls. The plan followed in the study of individual members of this class of substances is to ascertain exactly (1) the source from which each one may be obtained, (2) its chemical history, (3) the best means of preparation, of ascertaining their characters, composition, and of analytical determination. On the basis of such information it is considered that there will be a possibility of entering upon the inquiry into physiological questions as to the origin and functions of the tannins in plant life. In regard to this interesting department of the study of tannins it is not too much to say that nothing is known and nothing can be done until more is known of their composition and relations. It is with a view to furnish material for solving those problems that the author now gives the results of his own investigation of several kinds of tannin.

The first five sections of the volume are devoted to the subject of oak tannins in accordance with the plan above indicated. After giving a careful *résumé* of the chemical history of oak tannin from 1792, when Swayne communicated the result of his investigation to the Society of Arts, down to the publication of Etti's paper in 1889, the author points out that the elaborate arguments put forward by various investigators as to the constitution of oak tannins and their mutually severe criticism of each others views were really of little purpose, since none of them were certain as to the origin of the material operated upon, and not two of them derived their tannin from the same source. The methods of preparation adopted were also different, and in some respects too defective to admit of exact agreement of results, or to furnish material for determining formulæ.

In the preparation of oak tannin, Professor Trimble has found acetone a useful solvent for extraction, the subsequent purification of the product obtained being effected by treatment with water and acetic ether. The tannins of nine species of oak prepared in this manner have been described, and it is shown that the appearance of each is dependent upon the species from which it is derived, and the presence in each case of a peculiar colouring substance. In a purified condition they are all soluble in water, and their behaviour towards reagents is practically alike, especially in giving a green colour and precipitate with salts of iron. The blue colour oak bark infusions are generally stated to give is attributed to an associated substance. The chief product of decomposition by heat appears to be catechol, and by the action of alkali protocatechuic acid. Oak bark tannins are not glucosides, as there is no formation of glucose by hydrolysis. Their composition has been found to approximate to 59·79 carbon and 5·08 hydrogen, but the author refrains from attempting to suggest a formula until investigation has been carried further.

The following three sections of the volume are devoted to the consideration of the tannins of mangrove, canaigre, and chesnut in the same systematic manner as the oak tannins. In the concluding section it is shown that although tannins have many properties and reactions in common, comparison of the results obtained as to their composition indicates that the various kinds may be classified according to their percentages of carbon and hydrogen as belonging to the gall tannin group or to the oak tannin group. This classification is supported by the reactions which sharply distinguish tannins belonging to one or other of the two groups, viz., those with ferric salts, calcium hydrate, and bromine water. The substances which are described as tannins that are insoluble in water and do not precipitate gelatin, etc., are to be regarded as not belonging to the class of tannins at all.

References to the literature of the subject are given according to the method adopted in the former volume in an index of authors and a chronological list of titles of memoirs extending from 1791 to 1893, and, lastly, there is a short subject matter index of the contents of the volume.

## Obituary.

### W. D. SAVAGE.

We regret to record the death, at the age of 85 years, of Mr. W. D. Savage, J.P., at his residence, Elleslie House, Freshfield Road, Brighton, at ten o'clock on Tuesday night. Mr. Savage was a native of Selby, in Yorkshire, and settled in Brighton in 1832. He was elected one of the old Brighton Commissioners in 1848, and upon the incorporation of the town in 1854, he was elected a member of the first town council. He became one of the original aldermen, and was made a magistrate in 1873. He was for twenty-eight years a member of the Council of the Pharmaceutical Society of Great Britain, retiring in 1889, and acted as Vice-President during the years 1876–79. Mr. Savage leaves a widow and two sons—Dr. Savage, mental specialist, of Henrietta Street, Cavendish Square, London, and Mr. W. W. Savage, of St. James's Street, Brighton. The funeral is expected to take place on Saturday afternoon at three o'clock, at the Extra-Mural Cemetery.

Notice has also been received of the death of the following:—

On June 7, George Pattison, Pharmaceutical Chemist, of St. John Street Road, E.C. (Aged 70). Mr. Pattison was a very old and valued supporter of the Society, his certificate of membership dating from

1853. He was a Divisional Secretary for Central Finsbury, and had held the position ever since its creation in 1890.

On June 13, Ivor Evans, Chemist and Druggist, of Aberdare. (Aged 25). Mr. Evans was a student in the Society's School of Pharmacy during the session 1889–90, and passed the Minor in 1891. He was connected with the Society as an Associate at the time of his death.

## Correspondence.

### THE PHARMACY ACTS AMENDMENT BILL.

Sir,—I would like to know if the decision given at the general meeting of the Society, in respect to the motion proposed by Mr. Robinson, is accepted by the Council as the voice of the majority of the Society as a whole, so as to make further effort to alter the draft Pharmacy Act Amendment Bill, out of order and unavailing. It would be unfortunate to have opposition to the Bill stirred up while it was in Parliament; and it may prevent the expenditure of much wasted energy if it were clearly understood that the final word is considered to have been spoken. When I consider that among the members hitherto eligible for election to Council, though not pharmaceutical chemists, are those who were in business before the passing of the Act, this widening of the door to admit those now holding the position of "associates in business" in the proportion proposed is sufficiently generous to make sustained opposition sentimental rather than practical. I would regret if the Council were ever composed of a less number of pharmaceutical chemists than of members who have not that distinction, even though there were no safeguards. It would be a fine thing to go to Parliament with an unbroken front from within the fold, and a good augur for the next legislative enterprise. Therefore I would like to feel assured that the Council has closed its ear, and the lines ought to close up.

*Glasgow.* ALEX. LAING.

### UNAUTHORISED USE OF TITLES.

Sir,—I was rather surprised to find no further remarks on this subject in last week's Journal. Does not this important matter call for treatment, editorial and lay? Mr. Brittan justly asks for prompt attention by the Council. A glance at the constitution of the Council shows it is what the voters make it. That the Council should suppress the use of titles by unregistered persons cannot be disputed. The voters by their votes send men out of business, men interested in wholesale trade, and men who carry on business in dead men's names. If the Pharmacy Act means anything at all, surely it means that living persons, persons registered under the Act, are to carry on the business. It has been pointed out that a dead person, or a thing inanimate, such as a private or limited company, cannot be registered. Yet I am sorry to find the Council has not taken action against flagrant and, in some instances, most impudent offenders. The case quoted by the Board of Trade as deciding this point is contrary to fact, common sense, or justice, nevertheless the Council accepts the dictum. Whoever reads the case of the Pharmaceutical Society *v.* London and Provincial Supply Association with open eyes will find that the use of the title was never mentioned in the pleadings or in the judgment. But it was shown during the pleadings that the public were protected by the fact that the name of H. Longmore, chemist, was on the label, H. Longmore being a registered person, who personally conducted the sale. This company did not describe itself as "chemist and druggist," but other joint stock companies are doing so, on labels and in articles of association, without any attempt at interference by the Council. The deduction is that for fees only the Board of Trade can register companies to call themselves chemists and druggists, to carry on business under that title, without examination, as provided by Government in the Pharmacy Act, 1868. The Register of the Pharmaceutical Society may be superseded by that of Board of Trade, and the examinations made null and void, for it is easier far to form a limited company than pass the Minor. Personally I say the Council has ignored this matter of unauthorised use of title with such persistence that after a connection of thirty years with the Society I have separated myself from it wholly on account of the Council refusing to protect the title.

*Sheffield.* G. ELLINOR.

### "PHARMACEUTICAL CHEMIST" OR "PHARMACIST."

Sir,—In an editorial note in last week's Journal you say "it was desired (in 1868) that every chemist should have the title of pharmaceutical chemist." I have for a long time been impressed with this fact, and, further, I contend that the above two titles more correctly describe those engaged in pharmacy than does the general and wide term "chemist." I endeavoured to bring this forcibly before our association last January in my address (see *Pharm. Journ.*, Feb. 3), but the first portion dealing with this question evoked no recognition locally, nor have I ever seen any advocacy of the point I raised, viz., that when a man is qualified to practise pharmacy, his correct title is certainly one or both of the above, although at present it is illegal for him to use either. Where could the objection arise if such a reform were seriously taken in hand? As far as I can see, Major men are the only ones who would have a grievance, and if they are like myself they would not raise a finger to perpetuate an anomaly. If all qualified chemists were thus registered as "pharmaceutical chemists," would not this solve the difficulty of jury service? Some honorary title could dispose of the "Major" difficulty. The "Amendment Bill" now before us is good as far as it goes in enabling every chemist to be a M.P.S., but there will still be the funny distinction that he can place M.P.S. after his name, but must not call himself pharmacist or pharmaceutical chemist.

*Walton, Liverpool.* JOHN J. SMITH.

### CHEMISTS AND GROCERS.

Sir,—I enclose circular received this morning, thinking you might know of some "pharmaceuticalites" who are to be retaliated upon, and could give them warning of the intentions of the "grocerites." It is certainly very kind of them to give us warning, but does not the circular go a little too far when it practically threatens to prosecute all who are not willing to pay hush money in the shape of a subscription of 10s. 6*d*., and further promises to connive at breaches of the law by chemists (surely there is not one in our ranks) who will play the spy and informer upon his fellow tradesmen? Does this association really represent the opinion of the grocers as a body, I wonder? Nothing lower could be done by a company of blacklegs on a racecourse. If it does, the French epitaph, "Jacques Lecoq, born a man, died a grocer," is very expressive.

FIDELIS.

### THE REVISION OF THE BRITISH PHARMACOPŒIA.

Sir,—It has on previous occasions been shown that little if any of the valerianate of zinc of pharmacy is up to the official standard. Naylor, at the British Pharmaceutical Conference at Edinburgh ('Year-Book of Pharmacy,' 1892, 366), concluded a communication he then made thus:—"The appeal to manufacturers to use, in the preparation of valerianate of zinc, a purer acid than at present will, I am convinced, be met either by a non *possumus* or a ready response. This appeal notwithstanding we find to-day as great a variation in valerianate of zinc and as much deviation from the official standard as before Naylor's communication. In most cases a precipitated valerianate is met with insoluble in alcohol, although the Pharmacopœia directs that it shall be crystalline and soluble in alcohol. The former can be easily purchased, the latter is only procured with difficulty.

The United States Pharmacopœia in its 1880 edition required valerianate of zinc, with one molecule of water of crystallisation, to yield 28·3 per cent. of zinc oxide, while the 1890 revision recognises a salt with two molecules of water of crystallisation, but without requisition that it shall yield on ignition a definite percentage of oxide. The salt should yield by calculation 26·9 per cent. oxide on igniting, agreeing practically with Naylor's suggestion of 26 per cent. of oxide as a proper requirement.

A summary of the examination of ten samples obtained during the present year shows the great variation which exists in the various manufactures:—

| Sample Number. | Labelled. | | | Per Cent. of Oxide of Zinc on Ignition. |
|---|---|---|---|---|
| 1.............. | Zinci. | valer. | precip. | 65·3 |
| 2.............. | " | " | " | 64·3 |
| 3.............. | " | " | pur. cryst. | 24·9 |
| 4.............. | " | " | precip. | 30·6 |
| 5.............. | " | " | pur. cryst. | 27·1 |
| 6.............. | " | " | " | 43·7 |
| 7.............. | " | " | " | 34·0 |
| 8.............. | " | " | " | 27·0 |
| 9.............. | " | " | precip. | 30·0 |
| 10.............. | " | " | pur. cryst. | 26·4 |

All the samples contained butyrates in varying proportion, whilst one sample (6) smelt strongly of ethyl butyrate. It seems desirable, therefore, again to call on manufacturers of this salt to produce and charge accordingly an uniform crystalline valerianate of zinc, practically free from butyrates, soluble in alcohol and yielding not less that 26 and not more than 30 per cent. of oxide on ignition.

*Southwark, London.* JOHN C. UMNEY.

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Sir,—Although it may be considered rather late in the day to enter the field of criticism on the Pharmacopœia, especially when the new additions and alterations have called forth so many able pens to favour this or deprecate that, I am inclined to the belief that improvements on some old and new preparations are necessary in order to bring our authoritative guide as much "up-to-date" as possible:—

*Aromatic Waters* are prepared, according to the new U.S. Pharmacopœia, by triturating the oil with calcium phosphate, which is an excellent way of making a good product, as well as instructing the pharmacist to have many preparations made by himself without depending on wholesale houses. Calcium phosphate has as much dividing action upon an oil as steam, without the drawback of volatilisation of aroma. I have experimented in this way on aq. cinnamomi, and find that the yellow appearance of the product can be removed by animal charcoal and the liquid made quite clear without any loss of strength. In this paragraph I may mention that no distillation is necessary in the formula for spt. ammon. aromat., U.S.P., which was first put forward by Hill, of Edinburgh.

*Cascara.*—I have a theory that the resins contained in cascara act the part of acids towards alkalies, in much the same way as, for instance, podophyllin resin, which dissolves by combination when added to spt. ammon. aromat. so as to form the tinct. podophyll. ammon., so that we have probably resins (acids) as the active principles in some drugs and alkaloids (alkalies) likewise in others.

*Emp. Cantharid.*—It has been pointed out by Squibb that the old-fashioned plan of applying this preparation agrees with modern scientific knowledge, namely, first washing the part with soap and water and then using vinegar or dilute acetic acid just before the blister is applied. Professor Remington has advocated acetic acid as an excellent solvent of the active portions of drugs, and as both preservative and antiseptic. It is known that glacial acetic acid is a solvent of oils, etc., and I find that in experimenting with a small quantity of emp. cantharid. the acid mixes readily with it, so that this would be an advantage in having a very active blister, as well as preventing it from getting mouldy, which very frequently occurs. The suet, which is a relic of past ages, could easily be replaced by some other readily obtainable fatty substance, such as lard, as the errand-boy decidedly objects to run over the way to the flesher for a lump of suet "every time."

*Emp. Menthol.*—This is too soft, as patients complain of it "running." The consistence of emp. belladonnæ would no doubt be suitable.

*Ext. Cascaræ Sagradæ and Ext. Cascaræ Sagradæ Liq.*—Dr. Squibb, who is a well-known American expert on fluid extracts, finds that cascara can be exhausted by a menstruum of 25 per cent. alcohol of U.S.P. strength, 5 per cent. glycerin, and 70 per cent. water. By including the glycerin and, for the sake of uniformity, the menstruum and process for ext. hamamelidis liq., B.P., would be just about the same. Many pharmacists have put the query, Why extract the resins contained in cascara bark by using proof spirit in making the extract and leave them out in the liquid extract? Possibly the above method might equalise matters.

*Lin. Camphoræ.*—An improvement would be for the camphor to be mentioned "in powder," as the merest tyro in chemistry knows that a substance dissolves easier this way. The solubility of camphor in olive oil is 1 in 4, very slowly, and most likely on account of this fact some foreign pharmacopœias have their lin. camphoræ half the strength of ours.

| | |
|---|---|
| Camphor, finely powdered ............................ | 1 |
| Olive oil ............................................................ | 4 |
| Dissolve. | |

*Liniment Iodi.*—In making this liniment advantage could be taken of the solubility of iodine in ether. Medical preference is given to the use of ether on account of its penetration through the skin, and in proof of this fact a paper was contributed by Sir James Sawyer to the *Pharm. Journ.*, October 15, 1892, entitled "Ether as a Menstruum in Medication by the Skin," which is confirmed by Dr. Lauder Brunton. I suggest as a formula for lin. iodi:—

| | |
|---|---|
| Iodine ............................................ | 5 parts. |
| Ether, just sufficient to dissolve the iodine, or more, as may be required. | |
| Rectified spirit to make 40. | |

Very frequently doctors wish a liniment half the above strength, and this could be carried out by having a lin. iodi. dilut. made according to the above formula, but with half the quantity of iodine. Squibb has proved that nothing can be better than corked bottles, in which to store ether for temporary use, so that the advantage will be obvious when sending out the above liniments.

*Lin. Terebinth.*—This is too thick, and needs some thinning down by adding more water, which turns it from a fawn colour to a thick *white* emulsion, and easily poured out of a narrow-mouthed bottle. I have found that the turpentine has a solvent action on the soap if added to it in a dry mortar, since by the B.P. method the water causes the soap to become "stringy" and difficult to make smooth. When dispensing the B.P. liniment, it requires to be shaken out of the bottle.

*Liq. Arsenicalis and Liq. Arsenici Hydrochlor.*—By having a formula as stated below, it would do away with the necessity of keeping an alkaline and acid solution of arsenic, which are rather dangerous when combined with other ingredients in a prescription, as, for example, liq. arsenicalis and liq. strychninæ hydrochlor. In the following formula advantage is taken of the solubility of arsenic in glycerin (1 in 8). The formula is:—

*Liq. Arsenicalis.*

| | |
|---|---|
| Arsenious acid ........................... | 87 grs. |
| Glycerin.......................................... | 2 fluid ozs. |
| Compd. tr. of lavender—to ...... | 20 ozs. |

First dissolve the arsenic in the glycerin.

*Liq. Bismuthi.*—It would be as well to describe the test not as either neutral or "slightly alkaline," but to have it only "slightly alkaline," as I have often found that when it is neutral the liquor is inclined to deposit on account of the volatilisation or deficiency of the ammonia to keep the citrate of bismuth in solution. Sometimes a fungoid growth is apt to develop, and if the liquor be made with aq. chloroformi half the B.P. strength, it keeps very well.

*Liquor Calcis and Liquor Calcis Saccharat.*—It has been remarked by a distinguished physician, Sir William Roberts, that lime water has often proved a failure in the very general practice of administering it with milk, and this is owing to its feeble antacid properties and low saturating power. Six ounces of lime water are only equal to a single ordinary antacid dose of chalk or bicarbonate of soda. In order to meet his and other medical men's wishes, I suggest that the present two solutions of lime be expunged and have in their place a single liquor calcis, with a formula such as the following:—

*Liquor Calcis.*

| | |
|---|---|
| Slaked lime................................................ | 1 |
| Refined sugar in powder .............................. | 2 |
| Distilled water ............................................ | 100 |

The maximum dose would then be 1 oz., which is rather convenient to handle.

*Liq. Hydrarg Perchlor.*—This has been correctly described by Martindale as a solution of sal alembroth. The solubility of perchloride of mercury being 2 in 8 of glycerin, would it not be better to use this as a solvent instead of the chloride of ammonium, which has been handed down from time immemorial? Possibly perchloride of mercury in solution requires a preservative, like glycerin, to render it stable, much on the same principle that rectified spirit is added to chloroform for the same purpose, although both are powerful antiseptics.

*Liq. Potassæ and Liq. Sodæ.*—The same remarks as applied to liq. calcis saccharat. could be quoted here, as these liquors are very rarely ordered, probably on account of being too strong for general antacid use.

*Liq. Potassæ Effervescens.*—A customer who uses seltzogene powders regularly finds that 15 or 20 grs. to one pint suit best.

*Liq. Strychninæ Hydrochlor.*—It has occurred to me that the crystals seen occasionally in this preparation may in a great measure be due to the volatilisation of the spirit, which is the principal solvent. The stopper in the stock bottle is generally coated with a white deposit, and, curiously, there is always a powdery sediment, but very slight, at the bottom of the bottle. I have observed that in powdering the strychnine crystals in a mortar a peculiar odour is given out, which is quite distinct. In the following suggested formula glycerin is substituted for the spirit, since it is both a solvent and preservative of the strychnine hydrochlorate that is formed, with obviously no tendency to evaporation.

| | |
|---|---|
| Strychnine, in crystals | 9 grs. |
| Diluted hydrochloric acid | 14 minims. |
| Glycerin | 4 fl. grs. |
| Distilled water | 12 fl. drs. |

Reduce the strychnine to a fine powder in a mortar, add the acid, and when mixed together to form a paste, triturate with the glycerin. Heat very gently on a water-bath until dissolved. When cold add 6 fl. drs. of the water and filter, washing out the mortar, and filter with the remainder of the water until the product measures 2 fl. ozs.

*Liq. Zinci Chlorid.*—Too strong, and therefore never ordered.

*Lotio or Aqua Acid Carbolic and Oleum Carbolic.*—Since Sir Joseph Lister has discarded corrosive sublimate and given preference to his first favourite, carbolic acid, I would regard it desirable to place on record by having official his lotio (or aqua) acidi carbolici made with water (strength 1 in 20), and an oleum acidi carbolici of the same strength.

*Mel. Boracis.*—Too thin, as it actually runs out of the chip boxes when dispensed. I suggest to add some tragacanth, for the same purpose as in conf. sulphur, to give it "body."

*Oleum Acid Carbolic* (not official).—Although this oil is in large demand, there is no authoritative formula. The strength generally used is 1 in 20.

*Pil. Coloc. Co.*—Why not have treacle, as in the other pill masses.

*Pil. Opii.*—I understand that when a doctor orders this, he means powdered opium to be made up into 1-grain pills.

*Pil. Rhei Co.*—Glycerin, ½-oz., and treacle, 2 ozs., answer very well.

*Solution of Hydrogen Dioxide.* (not official).—For medicinal and chemical uses a solution can be made by using barium dioxide and phosphoric acid, as worked out by Squibb in his last 'Ephemeris.' As this solution is official in the new U.S. Pharmacopœia, the B.P. should not be behind.

*Inverness.* JOHN MITCHELL.

(*To be continued.*)

## Answers to Correspondents.

*Senex.*—The "marking nut," *Semecarpus anacardium.* The acrid juice of the pericarp, mixed with lime and water, is used as a marking ink in India.

## Books, etc., received.

PHARMACOPŒIA OF THE HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London. Pp. 35. 1s. From the Secretary.

A DICTIONARY OF MEDICINE. Edited by RICHARD QUAIN, Bart., M.D. Lond., LL.D. Ed., F.R.S., assisted by F. T. ROBERTS, M.D. Lond., B.Sc., and J. MITCHELL BRUCE, M.A. Abdn., M.D. Lond. New Edition, revised throughout and enlarged, in two volumes. Vol. 1; pp. i.-xxiv., 1 to 1223, Abdomen—Lysis; vol. 2; pp i.-vii., 1 to 1260, Macrocheilia—Zyme. 40s. net. London: Longmans and Co. From the Publishers.

THE PHYSIOLOGY OF THE CARBOHYDRATES. By F. W PAVY, M.D., LL.D., F.R.S. Pp. i.-x., 1 to 280. 10s. 6d. London: J. and A. Churchill. From the Publishers.

## Diary of the Week.

### TUESDAY, JUNE 26.

*Photographic Society of Great Britain.*

Technical Meeting. "Platinotype Printing" (illustrated), by F. Holyer. The new daylight carbon and tissue will be shown by H. A. Lawrence.

### THURSDAY, JUNE 28.

*Glasgow and West of Scotland Pharmaceutical Association.*

Extraordinary General Meeting to discuss the recent decision regarding the sale of poisons; the sale of Easton's syrup and kindred preparations; and the Draft Pharmacy Act Amendment Bill.

In view of the meeting of delegates of the Federation of Local Associations, the following resolution will be moved by Mr. J. Anderson Russell:—

We, the Glasgow and West of Scotland Pharmaceutical Association, taking as a watchword not "Pharmacy for Pharmacists," but "Pharmacists for Pharmacy, and Pharmacy for the Community," these being the relative positions each should occupy, consider it most desirable, and in pursuance of that aim:—

1. That all persons engaged in pharmacy be registered, separate registers being kept of "Graduates" and "Undergraduates," registration to be equal to Membership, Associateship, or Apprenticeship of the Pharmaceutical Society.
2. That all open shops for the sale of drugs be registered.
3. That registration be maintained under an annual licensing fee.
4. That medicines be compounded or distributed by registered graduates only, or by registered undergraduates under the supervision of a registered graduate, excepting under certain specified circumstances; a limit to be placed on individual power of supervision.
5. That the Pharmaceutical Society be empowered to exercise control over the conduct of its licencees, even to removal of names from registers if need be.
6. That breach of the second or fourth clause shall constitute a penal offence.

*Explanatory.*

By the term "Graduate" is signified a person who possesses the qualification of "Pharmaceutical Chemist" or of "Chemist and Druggist."

By the term "Undergraduate" is signified a person engaged in pharmacy who has not attained the position of "Graduate."

Election of District Secretary for the North-East.

*School of Pharmacy Students' Association*, at 7 p.m.

Annual Report of Executive Committee.

### SATURDAY, JUNE 30.

*Quekett Microscopical Club.*

Excursion to Oxshott. To meet at Waterloo.

COMMUNICATIONS, LETTERS, etc., received from Me Hill, Naylor, Richards, Robertson, Russell, Symons.

# "THE MONTH."

**Chrysarobin and Chrysophanic Acid.** In regard to the definition of these substances, G. B. Schmidt criticises the statements made in several pharmacopœias, and comes to the conclusion that the distinction of them is far from being satisfactory. He considers the description given by A. Andouard (*Nouveaux elements de Pharmacie*) to be the best definition of chrysophanic acid as distinguished from chrysarobin. The remarkable discrepancy of the statements made by several authors as to the coloration produced by solution in sulphuric acid or in caustic potash appears to show that the tendency to oxidation has led to erroneous inferences, and in any case Schmidt considers that the dispensing of chrysarobin in place of chrysophanic acid is inadmissible. That was allowed by the previous edition of the German Pharmacopœia, but has been corrected in the present edition. Andouard describes chrysophanic acid as follows—$C_{15}H_{10}O_4$, golden yellow klinorhombic prisms, melting at 162° C., nearly tasteless, insoluble in water, soluble in 224 parts boiling alcohol of 81 per cent., or in 1125 parts of 30 per cent. alcohol. Acetic acid, chloroform, and benzene also dissolve the acid. It is also readily soluble in alkaline solutions, to which it gives a dark red colour. With sulphuric acid it gives a red colour, and with melted caustic potash a blue colour. These reactions distinguish chrysophanic acid from chrysarobin, which gives a yellow colour with sulphuric acid and a brown colour with caustic potash (*Pharm. Weekblad.*, through *Pharm. Zeitung*, xxxix., 345).

**Sunlight Decomposition of Tartaric and Citric Acids.** Liebig observed that a solution of tartaric acid is decomposed by manganese peroxide, yielding carbonic anhydride, and a substance that reduces cupric oxide. Malic acid under the same conditions is lecomposed into aldehyde and carbonic anhydride, while citric acid yields acetone and carbonic anhydride. W. Seekamp finds that olutions of these acids undergo similar decomposition under the influence of sunlight when ıranium oxide is present, and it is considered hat the action of this substance is due to ts power of absorbing the chemically active ays. A solution of five per cent. tartaric acid nd one per cent. uranium oxide exosed to sunlight becomes green from reduction f the oxide. Gas is evolved, and the solution acuires a peculiar odour. On removing the aldeyde by distillation after some months, the solution as found to contain malic acid and succinic acid, sides unaltered tartaric acid and a reducing subance that was not identified. The decomposition described as consisting first in the conversion of rtaric acid into oxalic acid and the reducing bstance ($C_2H_4O_2$) :—

$$C_4H_6O_6 = C_2H_4O_2 + C_2H_2O_4.$$

e oxalic acid is then decomposed by sunlight :—

$$C_2H_2O_4 = CO_2 + CO + H_2O,$$

d the carbonic oxide reduces the tartaric acid ccessively to malic and succinic acids :—

$$C_4H_6O_6 + CO = C_4H_6O_5 + CO_2$$
$$C_4H_6O_5 + CO = C_4H_6O_4 + CO_2.$$

The malic acid is converted into aldehyde and oxalic acid :—

$$C_4H_6O_5 = C_2H_4O + C_2H_2O_4,$$

and, finally, the succinic acid gives propionic acid and carbonic anhydride (*Annalen*, 278, 373).

**Action of Light on Oxalic Acid.** Dr. A. Richardson finds that hydrogen peroxide is formed in solutions of oxalic acid, under the conjoint influence of light and oxygen, even though the solutions be previously sterilised at 100°, or reduced to a temperature of 0°. If either light or oxygen be excluded no hydrogen peroxide is formed, and the result is the same if rays of low refrangibility only are admitted in presence of oxygen. Further experiments show that the decomposition of aqueous solutions of oxalic acid, in presence of light and oxygen, results in the complete oxidation of its carbon to carbon dioxide. If oxygen be in excess, the hydrogen of the acid is oxidised to hydrogen peroxide, but with less oxygen it is oxidised to water. In the absence of oxygen the acid is decomposed at the expense of any hydrogen peroxide present; though if both oxidising agents are present, the oxygen is usually the active agent (*Journ. Chem. Soc.*, lxv., 450).

**Fluorplumbates and Free Fluorine.** Dr. B. Brauner, who, twelve years ago, described the compounds $CeF_4H_2O$ and $3KF,2CeF_4,2H_2O$, which when carefully heated lose water and then evolve fluorine, has now obtained the first member of a new series of salts, derivatives of fluorplumbic acid. This fluorplumbate occurs in needle-shaped crystals and has the composition $3KF,HF,PbF_4$. It is stable in dry air, but turns brown in moist air, the water decomposing it thus :—

$$3KF,HF,PbF_4 + nH_2O = \left\{ \begin{array}{c} PbO_2(H_2O?) + 3KF,HF + \\ 2HF + (n-3)H_2O. \end{array} \right.$$

Heated in a platinum tube the salt gives off hydrogen fluoride at 200°, and at a much higher temperature, though below red heat, free fluorine is evolved. This is apparently a trustworthy method of isolating the element by purely chemical means (*Journ. Chem. Soc.*, lxv., 393).

**Impurities in Formol.** A. Trillat points out that commercial formol or formic aldehyde may contain as impurities acetic acid, formic acid, pyroligneous products, and soluble salts of copper. The toxicity of formol, he states, is very weak, as regards animals, and they can survive for a prolonged period in an atmosphere impregnated with its vapours. As an antiseptic, he finds that the compound acts much more rapidly and surely in a state of vapour than in solution (*Journ. de Pharm.*, [5], xxix., 537).

**Detection of Hydrochloric Acid.** Villiers and Fayolle describe a method for detecting hydrochloric acid, which they claim will show the weakest traces of chlorides in the presence of iodides and bromides, bromine and iodine (after treatment with sulphuretted hydrogen), hydrobromic and hydriodic acids, etc. The process is based upon the production of coloured oxidation products by the action, upon an acid solution of aniline, of chlorine liberated by means of potassium permanganate and sulphuric acid; and the reaction is said to show clearly as little as 0·1 Mgrm. of hydrochloric acid, in the presence of 1000 parts (? grammes) of a mixture of bromides and iodides. Iodine either causes no reaction or forms a soluble colourless substance, and bromine forms an insoluble white compound, but chlorine gives rise to insoluble coloured oxidation products, black if present in quantity, otherwise violet when warm, and blue, turning subsequently to red, when cold. In a second paper the authors suggest means whereby the sensitiveness and accuracy of the test can be rendered as great in the presence of other halogens as when these are absent (*Comp. rend.*, cxviii., 1152 and 1204).

**Detection of Hydrobromic Acid.** Villiers and Fayolle also propose a test for hydrobromic acid in the presence of hydriodic acid which, like that for hydrochloric acid, they assert to have a precision comparable to that of spectroscopic methods, and to be superior to ordinary gravimetric ones. It consists in adding to the liquid to be examined, which should be free from nitric acid, an excess of ferric perchloride solution containing no free chlorine. The iodine separates and crystallises rapidly, if present in notable proportion, and is entirely volatilised on evaporating the mixture to dryness and further heating for an hour or two on a water-bath, whilst the hydrobromic acid remains unaffected. A little water is then added to the residue, the iron precipitated by an alkali, the filtrate supersaturated by hydrochloric acid, and chlorine water added drop by drop, whilst the liquid is shaken with carbon bisulphide, which is immediately coloured yellow by the liberated bromine (*Comp. rend.*, cxviii., 1265).

**Determination of Iodine.** Villiers and Fayolle separate and determine the amount of hydriodic acid in the presence of chlorides and bromides by adding to the solution (free from nitric acid) carbon bisulphide and an excess of ferric perchloride free from chlorine. After agitation the bisulphide is decanted and replaced by fresh until it is no longer coloured, four washings generally sufficing. By washing with a little water the separated bisulphide is then freed from traces of iron salt, after which the dissolved iodine is immediately titrated by means of sodium hyposulphite. The whole operation is performed in a special apparatus consisting of two separating funnels, one placed above the other. The two stop-cocks being opened, a sufficiency of water is drawn into the lower funnel by aspiration, and the bottom stop-cock is closed. A few drops of carbon bisulphide are then allowed to fall into the upper funnel and volatilised by the heat of the hand, so as to displace a certain volume of air, after which the upper stop-cock is also closed and the bisulphide, the liquid to be tested, and the ferric perchloride solution, are poured into the upper funnel, which is afterward closed with a glass stopper so as to permit of the whole apparatus being agitated (*Comp. rend.*, cxviii., 1332).

**Dimethyl Arsine.** A. W. Palmer has prepared this compound, the chloro derivative of which is well-known as cacodyl chloride, by the reduction of tetramethyl diarsine $(CH_3)_4As_2$ in alcoholic solution with platinised zinc and hydrochloric acid gas.

$$(CH_3)_4As_2 + H_2 = 2(CH_3)_2AsH.$$

It is a colourless mobile liquid, boiling at 36°-37° (*Berichte*, 27, 1378).

**Constitution of Morphine.** Knorr has shown in previous communications (*Ber.*, xxii., 181, 1113) that morphine by treatment with methyl iodide and sodium in methyl alcohol solution yields methylmorphine methiodide (codeine methiodide), and this by treatment with sodium hydrate yields methylmorphimethin. These reactions may be expressed by linear equations, thus :—

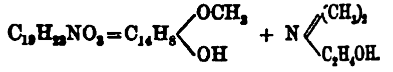
$$C_{17}H_{19}NO_3 + CH_3OH = C_{17}H_{18}\cdot(CH_3)NO_3 + H_2O.$$

$$C_{17}H_{18}(CH_3)NO_3 + CH_3I = C_{17}H_{18}(CH_3)NO_3\cdot CH_3I.$$

$$C_{17}H_{18}(CH_3)NO_3\cdot CH_3I + NaOH = C_{17}H_{17}(CH_3)_2NO_3 + NaI + H_2O.$$

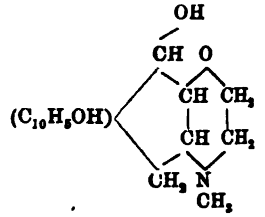
He further found that methylmorphimethin on treatment with acetic anhydride yields—

(1) An oily base giving the same analytical data as methylmorphimethin, but differing in other respects ; (2) Methoxyoxyphenanthren ; and (3) Oxyethyldimethylamine, thus—

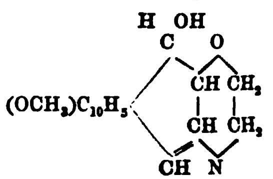


$$C_{19}H_{23}NO_3 = C_{14}H_8 \begin{cases} OCH_3 \\ OH \end{cases} + N \begin{cases} (CH_3)_2 \\ C_2H_4OH. \end{cases}$$

He now finds that the oily base above referred to is the optical isomer of methylmorphimethin. When methylmorphimethin is treated with acetic anhydride, only about half undergoes decomposition, and the other half is recovered as the other modification. Gaseous hydrogen chloride acts in a similar manner, only a portion of the methylmorphimethin being decomposed into dioxyphenanthrene, methyl chloride, and the chlorethyldimethylamine. The α- and β-methylmorphimethin differ in rotatory power, solubility in ether, melting point of their derivatives and salts, and also in their toxic effects. These facts support the formulæ previously suggested by the author for morphine and dimethyl morphine respectively.



Morphine.



Dimethylmorphine (methylmorphimethin).

(*Berichte*, 27, 1144).

**Moisture and Chemical Action.** H. B. Baker records the result experiments illustrating the infl of moisture on chemical action, confirming those of Veley (see p. 622). Thus, sulphur trioxide does not comb with highly purified lime, but a trace of mois brings about vivid incandescence. Dry co oxide is also without action on sulphur trio Dry purified lime does not decompose ammo chloride, which may be sublimed from the mix without the liberation of ammonia gas. Hyd and chlorine, under similar conditions, may be mixed and exposed to daylight without more than three-fourths of the gases combining (*Proc. Chem. Soc.*, 139, 111).

**Falsification of Potassium Permanganate.** An ingenious falsification of potassium permanganate of German origin is described by A. Schlumberger in the *Revue de chimie analytique*. Dextrin is coloured with malachite green or analogous colouring matter, then dried upon plates of glass in a similar manner to "scale" preparations. The product is described as shining black spangles having a greenish tinge. It is totally different in appearance to the violet crystals of the permanganate when separately examined and compared, but likely to escape notice when mixed with the genuine compound in small crystals. Schlumberger has been able to dye skeins of silk of a green colour by soaking them in a solution prepared from the pseudo-permanganate (*Répertoire*, [3], vi., 260).

**Quinine Alkaloids.** Grimaux states that the physiological and therapeutic action of the series of ethers derived from cupreine increases as they ascend in the series, thus :—

$C_{19}H_{21}N_2O{\cdot}OH$, Cupreine.
$C_{19}H_{21}N_2O{\cdot}OCH_3$, Quinine.
$C_{19}H_{21}N_2O{\cdot}OC_2H_5$, Quinethyline.
$C_{19}H_{21}N_2O{\cdot}OC_3H_7$, Quinpropyline.

Quinine is slightly more toxic than cupreine, and quinethyline than quinine, while quinpropyline is about four times as toxic as quinine, and may be found of use as an antipyretic in the case of continuous fever. Study of the therapeutic action of quinethyline shows it to be a much better antiperiodic than quinine (*Comp. rend.*, cxviii., 1303).

**Solvents for Quinine Sulphate.** Crouzel considers sulphuric acid objectionable as a solvent for quinine sulphate on account of its disagreeable taste, its action on the mucous membrane, and its interference with the digestive fluids and ferments. He considers tartaric and citric acids free from these objections. For hypodermic injections the best proportions for dissolving one gramme of quinine sulphate are :—20 centigrammes of tartaric acid or 60 centigrammes of citric acid, in 120 grammes of distilled water (*Bull. de Pharm. de Bordeaux*, xxxiv., 130).

**Wood Creosote.** Béhal and Choay have made qualitative determinations of the creosotes obtained from beech and oak wood respectively, and find that their composition is identical. Both are very complex mixtures, containing phenol; ortho-, meta-, and para-cresol; ortho-ethylphenol; two meta-xylenols (1·3·4 and 1·3·5); guaiacol; creosol; and ethyl-guaiacol. There are also small quantities of sulphur derivatives, probably thiophenols, and of a body which, under the influence of ammonia and the air, gives rise to a substance that forms intense blue solutions with alkalies, changing to red with acids. These properties somewhat resemble those of orcein, which was shown by Liebermann to be a mixture (*Comp. rend.*, cxviii., 1339).

**Stability of Sublimate Solutions.** This subject continues to receive attention, the latest contribution to the discussion being by E. Burcker, who concludes that natural waters cause the immediate decomposition of mercuric chloride by reason of the dissolved salts, etc., they contain, and that this decomposition continues under the combined influence of air, light, and the mineral and organic contents of the water and air. The decomposition is checked when the solution is kept from the air and light, and even when exposed to their influence solutions prepared with pure distilled water undergo but slight decomposition (*Comp. rend.*, cxviii., 1345).

**Urea in the Liver.** C. Richet has demonstrated that urea may continue to be formed in the liver of animals after death and removal of the organ from the body. He considers that this result is due to the action of a soluble ferment or diastase, and points out that a remarkable analogy is thus shown to exist with the post-mortem formation of sugar resulting from chemical action taking place in the tissues in the same organ, Claude Bernard having found that the conversion of hepatic glycogen into sugar may continue under certain conditions for several hours after the liver is removed from the body (*Comp. rend.*, cxviii., 1125).

**Digestion without Ferments.** A. Béchamp criticises at length the published results of Dastre's experiments on digestion (*ante*, p. 1005), and concludes that no transformation of albuminoids in the nature of digestive phenomena can take place without a physiological cause. He claims that Dastre's results confirm those obtained by himself when working in a similar direction, but that the hypothesis according to which the transformation of the albuminoids is due to the antiseptic saline matter present will not bear scrutiny. In the first place, it is pointed out, fibrin is not strictly comparable to casein, as assumed by Dastre. The latter when pure and fresh dissolves instantly and entirely in very dilute hydrochloric acid, and may be preserved indefinitely, without change, in phenol water. In the case of fibrin, however, the action of the acid is very slow, and the addition of a small quantity of phenol greatly retards solution. Moreover, fibrin that has been cooked at 100° is no longer soluble in the dilute acid, whereas casein under similar conditions retains its perfect solubility, and whilst the latter, even when desiccated and heated to 140°, is entirely soluble in ½ per cent. acid, fresh fibrin never dissolves entirely. The insoluble residue consists of the microzymes of the blood, which are capable of decomposing hydrogen peroxide, or rendering starch granules fluid (*Comp. rend.*, lxvii., 408, and lxix., 713). These microzymes, being albuminoids, secrete a zymase which slowly transforms the rest of the fibrin, splitting it up into the various definite and stable products detected by Dastre (*Comp. rend.*, cxviii., 1157).

**Latex of the Lacquer Tree.** G. Bertrand has received and examined a supply of pure "So'n-mat-Dâu," or latex obtained from various species of *Rhus*, used by the Chinese and Japanese to lacquer furniture and other articles. It is described as resembling a thick cream, almost white in colour, having a faint odour recalling that of butyric acid, and reddening blue litmus paper. In filled and closed vessels it may be preserved for a long time, but it oxidises rapidly in contact with air, gradually becoming intensely black in colour, and insoluble in the usual solvents. Bertrand finds, however, that this change in properties is not due to simple oxidation, but depends upon diastasic action. By treatment of the substance with alcohol, the diastase was rendered insoluble, and precipitated with a mixture of galactose and arabinose. The diastase, termed "laccase," has no action upon starch, saccharose, amygdalin, potassium myronate, or fibrin. From the alcoholic solution was obtained on evaporation a residue containing glucose and mineral salts soluble in water, and "laccol," a thick oily liquid soluble in ether, alcohol, chloroform, etc., which possessed a rubefacient action on the skin and caused intense pruritis. The laccol is readily oxidised, and appears to be emulsified in the natural product by means of the gum and laccase dissolved in a little water. It would appear, therefore, that the latex is transformed into the lacquer properly so-called by the successive action of atmospheric oxygen and laccase upon the laccol (*Comp. rend.*, cxviii., 1215).

**Papain.** At the recent meeting of Bavarian pharmacists, Dr. Hobein communicated the results of his experience with this material. He states that the papain met with in trade is of two kinds, the one active only in alkaline liquids, while the other one is active in acid liquids. The peptonising action in acid liquids takes place more readily when 0·2 per cent. hydrochloric acid is used, and in such an acid liquid a dilute solution of papain is most efficacious than a more concentrated solution. The effect produced is lessened when the amount of acid is increased or reduced, and it is increased by a rise of temperature to about 60° C. In alkaline liquids the action is still more effectual, and the strength most favourable to it corresponds with 0·1 per cent. of caustic soda. In a solution of sodium carbonate of equivalent strength there is very little action, especially upon fibrin. Judging from experiments made with papayotin prepared from the fresh juice of *Carica papaya*, it is inferred that those preparations which act only in alkaline liquids contain pure papayotin, and that those which are active in acid liquids are mixed with pepsin. That view is certainly opposed to the observations of Willmack, Hansen, and other investigators, who have all confirmed the action of the plant juice in acid liquids, and the precipitate taken for pepsin by Hobein would probably contain a considerable proportion of peptone. It remains for further investigation to ascertain a satisfactory means of detecting the presence of pepsin, and of deciding the question whether the papain preparations which are active in acid liquids really contain an admixture of pepsin, or whether the juice of the plant contains different ferments which act differently (*Pharm. Zeit.*, xxxix., 386).

**Papain and Pepsin.** A writer in the *Medical Press* observes that although papain and pepsin are employed for similar purposes, they act under totally different conditions. It is impossible, therefore, to gauge their value under any one set of conditions, the vegetable ferment being obviously calculated to deal with a different class of albuminoid substances to those found in the animal body. The term "papain," it is urged, should be restricted to preparations of the papaw juice from which all irritating principles have been carefully eliminated. Though papain is unlikely to affect the position of pepsin in the therapeutics of gastric indigestion, it is suggested that in certain cases it may displace, or serve as a useful adjunct to, the animal ferment.

**Constitution of Licareol.** Barbier and Bouveault give the boiling point of pure licareol (*ante*, p. [illegible]) as 198°, and show, as the result of a series of experiments, that the oxidation products of this alcohol are almost identical with those of lemonol (geraniol). Though this would seem to indicate that the constitution of the two alcohols might reasonably be represented by the same formula, the authors adopt two distinct formulæ because (1) the two aldehydes differ somewhat, and (2) licareol is optically active whilst lemonol is not (*Comp. rend.*, cxviii., 1208).

**Tannin of Punica Granatum.** J. Culley has examined this tannin, and finds that its reactions agree with those of gallo-tannic acid. Its ultimate composition also compares so closely with that of the latter that the conclusion arrived at is that it is identical with the tannin obtained from galls (*Am. Journ. Pharm.*, [4], lxvi., 280).

**Indian Oak Barks.** Professor H. Trimble has received from India specimens of four oak barks, and investigated their composition so far as the small amount of material would allow. The percentages of tannin found were as follows :—

| Species. | Tannin. | | Moisture. | Ash in dry bark. |
|---|---|---|---|---|
| | In air-dry bark. | In quite dry bark. | | |
| *Quercus annulata* .. | 11·87 | 12·20 | 6·85 | 11·39 |
| „ *dilatata* .. | 7·40 | 7·94 | 6·83 | 10·02 |
| „ *incana* .. | 22·12 | 23·86 | 5·31 | 11·06 |
| „ *semicarpifolia* .. | 7·99 | 8·60 | 7·04 | 10·83 |

The tannin in the four barks appeared to be identical with that of American oaks (*Am. Journ. Pharm.*, [4], lxvi., 299).

**Carthagena Ipecacuanha.** C. Hartwich does not share Moeller's opinion that the false ipecacuanha with sugary cortex is derived from the same plant as Carthagena ipecacuanha. The total absence (not simply diminution in quantity) of emetine, the presence of pigment, and the fact that both roots occur in the same package are objections; moreover, Hartwich has been able to compare it with a specimen of *Psychotria emetica*, collected by Triana, and finds them identical. In Carthagena ipecacuanha two varieties are, according to Hartwich, to be distinguished; the one contains distinct medullary rays, compound starch grains, with at most four component granules; in the other as many as eight component granules may be counted. The latter variety appears to be the one generally met with (*Zeitschr. d. Oesterr. Apot. Verein.*, xxxii., 345).

**American Colocynth.** L. E. Sayre describes some colocynth fruits grown from Trieste seed at the canaigre works, Deming, New Mexico, by C. B. Allaire. The plants bore from sixty-five to eighty fruits each, the samples of which measured from thirteen to twenty-four inches in circumference. The American colocynth fruits contained about twice as many seeds as those imported from Trieste, but possessed only about two-thirds the cathartic action of the latter. A fruit weighing 1101 [illegible] yielded 394·58 Gm. of pulp free from seeds, but this was reduced on drying to 31·75 Gm. When powdered it was light in colour and very bitter, but was much more compact than the product of the Indian fruit. Parallel determinations of the proximate constituents of the imported pulp and the American product yielded the following percentage results:—

| Constituents. | Imported. | American. |
|---|---|---|
| I. Ether-chloroform extract ...... | 3·21 | 4·62 |
| (*a*) Fat ......... .................... | 1·11 | ·521 |
| (*b*) Resin ........................ | ·64 | ·48 |
| II. Alcoholic extract of residue from I. ..................... | 16·61 | 23·23 |
| Reducing sugar ............ | 2·15 | 10 31 |
| III. Aqueous extract of residue from II. ..................... | 31·07 | 24·69 |
| Gum ........................... | 9·36 | 12·61 |
| IV. Amyloid principles ........... | 2·07 | 2 34 |
| V. Cellulose ........................... | 13·5 | 14·76 |
| VI. Albuminous (protein) compounds ..... ................ | 14·31 | 14·69 |
| VII. Ash .................. ........... | 9·76 | 6 01 |
| VIII. Moisture........................ | 6·8 | 7·9 |
| Diluted alcoholic (official U.S.P.) extract .................. ... | 32·68 | 38·87 |

The bitter principle, colocynthin, was not isolated on account of insufficiency of material (*Am. Journ. Phar.*, [4], lxvi., 274).

**Sterilisation of Catgut.** Dr. Répin describes the following process for sterilising catgut intended for use in surgical operations, by the vapour of superheated alcohol:—All grease is first removed by the solvent action of ether or carbon bisulphide, and the catgut is then dried in a hot air chamber, the temperature being gradually increased to 110°. To avoid re-absorption of water the catgut should next be sterilised without delay, by being placed, together with a little absolute alcohol, in a glass tube or metallic cylinder, be hermetically closed, and heated to 120° in an autoclave for an hour. If desired, the catgut may be passed through a solution of chromic acid after removing the grease and before desiccation, but this is not essential, as the product is perfectly satisfactory without this treatment. The sterilisation has been shown by experiment to be perfect, and the catgut is also excellently preserved, whereas, if sterilised by heat, it is transformed into gelatin (*Ann. de l'Inst. Pasteur*, viii., 170).

**Ptomaine in Cancer.** A. B. Griffiths gives the name "cancerine" to the ptomaine extracted by him from the urine of cancer patients. It is intensely poisonous, causing fever and death in three hours, and analysis indicates that its formula is $C_8H_5NO_5$. It crystallises in minute white needles, which are soluble in water, and have an alkaline reaction. The ptomaine forms a hydrochlorate, an auro-chloride, and a platino-chloride, gives a yellow precipitate with phosphotungstic acid, a brownish one with phosphomolybdic acid, and red with silver nitrate. Mercuric chloride forms with it a grey precipitate, and Nessler's reagent a brownish one (*Comp. rend.*, cxviii., 1350).

**Intercellular Communication in Lichens.** G. Poirault has found in the thallus and apothecia of lichens indications of very minute channels in the cell-walls, permitting of the inter-communication of the cell contents, the protoplasm communicating through the perforations in the membrane. Fresh material is not necessary for the examination, and previous fixation of the protoplasm is not required, as in the case of the Phanerogams. In *Usnea barbata* communication is said to exist between distant elements, as well as between adjoining cells. Other species in which similar phenomena have been observed are *Cladonia rangiferina*, *Peltigera canina*, and *Calicium chrysocephalum*. It is proposed to illustrate these peculiarities of structure in a subsequent note (*Comp. rend.*, cxviii., 1362).

**Carbolic Acid Ointment.** It has been stated that carbolic acid will crystallise out from ointment prepared as the B.P. directs, but a writer in the *Pharmaceutische Zeitung* states that separation takes place only when the ingredients are mixed by rubbing them together, and that when the solid carbolic acid is dissolved in melted paraffin or lard, even to the extent of 10 per cent., no such separation takes place.

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## BALATA.

One of the most valuable forest products of Surinam, which has been considerably exported, is the caoutchouc-like substance known as balata. Balata gum holds the first place among the substitutes for gutta-percha. It is obtained from the *Mimusops balata*. The balata gum combines in some degree the elasticity of caoutchouc with the ductility of gutta-percha, freely softening and becoming plastic, and being easily moulded like gutta-percha. The tree which produces this is widely distributed over the colony, even in parts so far in the interior as to have been hardly visited as yet; and the industry, now that experience has taught how it can be carried on without the wasteful extermination of the tree, should have a positive future value. Better means of access and of working are required before the expenses of production form the proper proportion of the value produced. Balata is principally exported to the United States of America, small consignments also reaching Holland and Great Britain.—*Consular Report.*

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## CINCHONA BARK IN JAVA.

Production of this article appears to have now (1893) become greatly in excess of the consumption, and Java planters are seriously contemplating combining to decrease the quantity harvested as the only effectual way of raising prices, which have now reached a wholly unremunerative level. Owing to the disproportion now existing between supply and demand, home manufacturers have been able to combine both for the purpose of reducing the prices paid for the bark and of raising their selling rates for the prepared drug. During 1893 the prices paid per kilogram unit in the Dutch market varied from 5⅞ c. (1⅛*d.*) in January to 2½ c. (½*d.*) in August, a recovery of 1⅜ c. (¼*d.*) taking place at the end of the year.—*Consular Report.*

## THE ONLY SALVATION OF THE PHARMACIST.

BY DR. OSCAR OLDBERG.

*Dean of the Illinois College of Pharmacy.*

(*Concluded from page* 1070.)

But there are thousands of pharmacists who ought not to be satisfied with the present condition of affairs. As it is impossible to require of the druggist who supplies the wants of a few hundred people at a cross-roads town that he shall possess education such as the professional pharmacist ought to have, let there be at least two classes of druggists, in order that it may be possible to establish a sufficiently high standard of attainments for one class. If all are put upon the same level, that level must be so far below that which is necessary to warrant the claim of professional education that this claim will seem farcical.

Pharmacists of the first class should be required to have a systematic training extending through two years, with eight or nine months' study in each year, the curriculum of studies and laboratory courses to be such as to occupy their whole time and attention during all of that time. They should receive a distinctive title or designation by which they might be known to the public and the medical profession, and no person should be permitted to use that title except those who have satisfactorily completed the course of education prescribed. They should be competent to carry out intelligently any of the processes or manipulations by which the official preparations are made, and the methods by which the medicines prescribed by physicians are compounded or dispensed, and should possess the training and skill requisite to correctly apply the tests of identity, purity, and strength, prescribed for medicinal substances by the Pharmacopœia of the United States. They should be competent to perform the duties of public analysts, at least to the extent of being able to make the ordinary examinations of water, milk, and urine, and other similar tests, and, in the words of the Seventh International Pharmaceutical Congress, to be "the common chemists of the common people." And they should have the right to prepare, dispense, and sell any medicines, including those possessing properties which render them dangerous in the hands of persons not acquainted with their composition, properties, and reactions.

Pharmacists of the second class should also have a specific title or designation sufficiently distinct from that of the pharmacists of the first class, and should have the exclusive right to its use. They should possess a knowledge of pharmacy sufficient to enable them to correctly prepare the simpler forms of medicinal preparations, and should have the right to prepare, dispense, and sell any remedies for domestic use or prescribed by physicians, except certain potent and important medicinal substances specifically named, which, either alone or combined with any other substances, should be permitted to be dispensed only by pharmacists of the first class. Much less in the way of educational requirements should be exacted of pharmacists of the second class. A course of nine months' study would perhaps be sufficient, provided the whole time is employed exclusively upon the courses of study and laboratory practice. Pharmacists of the second class should not be required to be competent to perform all the official tests, nor to make chemical examinations of urine, water, etc. They should, of course, have the privilege of qualifying themselves for registration as pharmacists of the first class at any time.

As to the list of potent medicinal substances which should not be permitted to be compounded or dispensed except by pharmacists of the first class, it cannot and need not be a complete list of all dangerous remedies. It is only necessary that it should include a sufficient number of the most potent and important medicines, to effect the ultimate restriction of specially important prescription work to the hands of thoroughly competent dispensers, who will thus receive some substantial recognition in return for the higher qualifications exacted of them.

This plan, if introduced by law, would very soon bring about a decided improvement. Pharmacists of the first class would certainly take care to inform both the medical profession and the public of the distinction and difference between both classes, and neither the physician nor the layman would fail to observe them.

It is not proposed that any existing rights be interfered with, or, in other words, to make such a law retro-active. Let all who have already acquired the right to prepare and sell medicines retain it; let the rights of the manufacturer be undisturbed, and the physicians continue in the enjoyment of their right to dispense any medicines they may please to their own patients. In short, let all present rights and privileges relative to the sale of medicines remain unchanged, but from and after the enactment of the new law, let no person making application for licence to practise pharmacy receive it, except upon the conditions described. All pharmacists already registered should be entitled to unlimited and unconditional renewals of their licences, without curtailment of any of the rights they now enjoy, but they should, of course, not be permitted to use the new distinctive titles selected to stand for definite standards of education.

Can any one doubt that in the course of twenty years such a plan would work a marked change for the better? No injustice would be done, and no rights violated or abrogated.

The following is suggested as a sufficient list of potent remedies, which should be permitted to be sold only by pharmacists of the first class (and, during the remainder of their natural lives, by those pharmacists who already have the right to sell them). Preparations of aconite, belladonna, cannabis indica, cantharis, coca, colchicum, conium, digitalis, ergot, gelsemium, hyoscyamus, ignatia, nux vomica, opium, physostigma, phytolacca, pilocarpus, stramonium, strophanthus, and veratrum viride; preparations of arsenic and of gold, and mercuric compounds; bromine, phosphorus, hydrocyanic acid, and all cyanides; chl chloroform, and ether for anæsthetic uses; croton acetanilid, antipyrine, hypnone, phenacetin, sa sulphonal, urethan, and all alkaloids and their salts

As to general education preliminary to the s matic courses in the pharmaceutical school or college and preliminary to the practical experience in pharmacy which might be required by the law, it is not too much to insist upon that every person who desires to enter a pharmacy for the purpose of ultimately becoming a pharmacist, must at least have gone far enough in the ordinary school branches to be entitled to admission to a standard high school, or even to the third year studies of the high school course.

With regard to age, it would be quite right to admit any high school graduate to the pharmaceutical school or to the pharmacy without reference to age, and to require all who are less advanced to be at least eighteen years of age before they can enter.

The pharmaceutical experience in the shop, required for registration, should be not less than two years, in any case, and should not be less than four years including the time devoted to the courses of instruction in the pharmaceutical school or college, and it should be optional with the student whether this practical experience in the shop precedes or follows the courses of pharmaceutical study.

The Pharmacy Boards should of course enforce the legal requirements as to preliminary education of the apprentice and the required period of apprenticeship, and to that end should keep a complete register of all persons engaged in pharmaceutical work in any drug store, or learning the art of pharmacy.—*Apothecary.*

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## AMERICAN PHARMACEUTICAL ASSOCIATION.

### SECTION ON LEGISLATION AND EDUCATION.

*Queries for the Meeting to be held at Asheville, N.C., September*, 1894.

1. Should students of pharmacy be required to give evidence of having had experience in a drug store before permitting them to graduate or register, regardless of quantity or quality of knowledge possessed?

2. Should such students give their whole time, during college years, to study, or divide it between attending college and working in a store?

3. Can a minimum standard of time of attendance and quality of pharmaceutical education be adopted by American colleges? Will each college kindly consider this question and send a representative to the Asheville meeting to debate it?

4. How can we get the pharmacy laws of the various states more uniform in their requirements?

5. What objections can be urged against bestowing the degree of Doctor in Pharmacy upon graduates in pharmacy who take a post-graduate course?

6. Describe special devices for simplifying or illustrating various points in the study of pharmacy and cognate sciences.

7. Outline the benefits derived by classes in pharmacy visiting in a body large laboratories, manufactories, and pharmaceutical warehouses.

8. What can the American Pharmaceutical Association do towards improving such parts of the patent and trade mark laws as have a bearing on pharmacy?

9. Are registered clerks, by virtue of their registration, officers of the State, and, if so, is not the State, instead of the employer, responsible before the law for their serious mistakes?

10. Should graduates in pharmacy be compelled to pass the examinations of boards of pharmacy before being registered?

11. What principles should guide boards of pharmacy in framing their examination questions?

12. How can dull and lazy students, in colleges of pharmacy, be kept as near as possible abreast of the work done by the intelligent and diligent.

13. How can colleges of pharmacy be placed upon a purely educational basis, instead of being conducted for the money they can make?

14. Should any candidate be permitted to graduate in pharmacy before he is able to apply the tests and assays of the United States Pharmacopœia?

15. What should be the minimum limit of knowledge in microscopy before being permitted to graduate?

16. What should be the minimum limit of knowledge in botany before granting a degree?

17. How much knowledge of materia medica should be required of every graduate in pharmacy?

18. Should candidates for graduation in pharmacy be able to make all preparations, a process for which is given in the United States Pharmacopœia?

19. Where, in pharmacy teaching, are the limits between practical and impractical knowledge, and what constitutes a practical examination?

20. Would it be a gain or loss to pharmacists to compel would-be apprentices to pass a board of pharmacy examination on their general education before permitting them to begin work in a drug store?

21. Should boards of pharmacy publish from time to time, in the pharmaceutical press, their past examination questions as a guide to future candidates of the nature of the subjects upon which they are expected to pass?

22. Describe an ideal laboratory for the teaching of practical pharmacy.

23. Give a set of rules for the government of students at colleges of pharmacy.

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Volunteer papers on any subject within the scope of this section are desired, either from members or non-members of the American Pharmaceutical Association.

R. G. Eccles, Chairman, 191, Dean Street, Brooklyn, N.Y.; H. M. Whelpley, 2342, Albion Place, St. Louis, Mo.; L. C. Hogan, Secretary, 6443, Yale Street, Englewood, Ill.

# Oxford and its University.

## SITUATION AND HISTORY OF THE CITY.

The ancient city of Oxford lies on a low peninsula between the rivers Isis (Thames) and Cherwell, immediately above their junction, and is bounded on three sides by water. On the west, among the meadows of Osney, the Isis breaks into an intricate net-work of streams, which afterwards re-unite to form the southern boundary of the city, and the Cherwell, famed for its water-lilies, flows into the Isis after skirting Christchurch Meadow to the east. From certain points of view the city seems to be surrounded by hills; one chain extending from Wytham Hill to Cumnor Hurst and Stonesheath on the west of the Thames valley, whilst Headington Hill and Shotover are seen to the east. The distance by river from London is about one hundred and twelve miles, and by rail sixty-three miles

The population of Oxford, which at the time of the Domesday survey in 1086 was about seventeen hundred, is now nearly forty-six thousand. The early history of the place is confused by a mass of legendary lore. Thus, Antony à Wood, the Oxford antiquarian, refers to it as standing "when David was King of Judea." Ross, another antiquarian, states that the ancient name of the city was Membre, Memphric, or Caer-Memphric, after Memphric, a British king, its supposed founder; and an ancient document refers to it as "Memphriter, on the River Temes." Other names subsequently applied to the city were Bello-situm or Beaumond (beautiful), and Rhydgohain or Rydychen (Celtic = a ford), whilst the Saxons called it Oxeneford. This name appears in Domesday book, and may be regarded as a corruption of Ousenford—the ford over the Ouse or river. The name "Isis" is by some supposed to be derived from "Ouse."

It appears very probable, however, that the nucleus of the city as it now exists was a nunnery founded in honour of St. Frideswide, on or near the site of the present cathedral, during the eighth century of the present era. Alfred the Great is alleged to have established a royal mint in the place, and in the "Saxon Chronicle" it is stated that in 912 Edward the Elder included Oxford in his kingdom of Wessex. From this period the Castle Mound, still existing, is supposed to date. The Danes burned Oxford in 1009, and four years later, under Sweyn, compelled it to give hostages. Witenagemots were held there on several occasions, Harold being chosen king at the one held in 1036. About a century later, in 1142, the Empress Matilda was besieged in the Castle by Stephen, and escaped thence clad in white garments and accompanied by only three attendants, whilst the ground was covered with snow. Ten years earlier Henry I. had built the royal Palace of Beaumont, in the neighbourhood of the present Beaumont Street. This was subsequently the favourite residence of his grandson, Henry II., and Richard I. and his brother John are said to have been born here. The Mad Parliament was held at Oxford in 1258. Charles I. made the city his headquarters in 1642, residing at Christ Church, and escaped thence in 1646, when it was besieged for the last time and capitulated to Fairfax. The oldest existing English newspaper—the *London Gazette*—which was founded on the *Mercurius Politicus* and the *Public Intelligencer*, the chief papers under Cromwell, was originally published at Oxford, under the style of the *Oxford Gazette*. The first number appeared on November 14, 1665, after the great plague had driven the court of Charles II. to Oxford, and with the publication of the twenty-fourth number, on February 1, 1666, it became the *London Gazette*. The last parliament at Oxford was also held in this reign, in 1681, when the House of Lords sat in Christ Church Hall and the Commons assembled in the Schools.

It will thus be seen that the city of Oxford is far from being a mere off-shoot of the University. John Richard Green, the historian, states that it had been a prosperous city hundreds of years before the foundation of the University, the connection of the city with which, according to this writer, "has probably been its commercial ruin," for "the University found Oxford a busy, prosperous borough, and reduced it to a cluster of lodging-houses." As a military post and a place for national assemblies it had become of considerable importance about the time of the Norman Conquest, and it was probably a centre of learning at a yet earlier period; for it is related that Ethelbald caused hostels to be built for the accommodation of students about 730 A.D. The University proper, however, did not come into existence until some five hundred years later.

In the thirteenth century Oxford was a city of but five or six thousand inhabitants, whose dwellings were protected by the Castle on the west, and the tower which defended the northern gate and still forms part of St. Michael's Church, yet Green speaks of the place as standing at that time in the front rank of English towns. In his expressive word picture of the place he explains that the town church of St. Martin then rose from the midst of a group of houses, huddled for protection under the castle and encircled by massive walls, of which a remnant now bounds the domain of New College. The peninsula on which the city stood sloped gently on both sides to the rivers on the east and west, whilst a sharper descent on the south led to the city bridge. A wild forest country lay around, moors fringed the course of the Thames, and great woods closed the horizon to the south and east. On every side but the north the town was guarded by swampy meadows along the Cherwell or the numerous streams into which the Isis breaks up. From the midst of the meadows of Osney rose a "mitred abbey" of Austin Canons, giving the town some ecclesiastical dignity; the frequent visits of English kings and the presence of repeated important councils marked its political weight; and the settlement of one of the wealthiest English Jewries in the heart of the town indicated the activity of its trade.

The prominent position taken by Oxford in national affairs, prior to the birth of its University, is therefore demonstrated, but there is no doubt that the latter has since formed the chief factor of importance in the place. Nothing is known of the causes that first attracted teachers and students, and led to the foundation of the University in the twelfth or thirteenth century. This much is certain, however, that before the close of the thirteenth century, which has been described as the most romantic period in the history of the human intellect, the number of students was large enough to crowd the little city and even the bastions on its walls.

*(To be continued).*

# The Pharmaceutical Journal

FIFTY-THIRD YEAR OF PUBLICATION.

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*Advertisements and remittances must be sent to the Office of the* PHARMACEUTICAL JOURNAL, *5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to* "STREET BROTHERS."

## NORTH BRITISH BRANCH.

THE proceedings at the annual meeting of the North British Branch of the Society, held last week in Edinburgh, a full report of which appears in this number of the Journal (p. 1096), show that the work of the Society is being carried on in Scotland with considerable efficiency, both by the local executive and the Scottish Board of Examiners. There is also evidence of a hearty appreciation of the efforts made by the Council to promote the general interests of the pharmaceutical body. In the address of the CHAIRMAN of the Executive the increase of members of the Society in Scotland was referred to as being matter for congratulation, although a large margin is still left for further expansion. In that respect the recent appointment of additional local secretaries in accordance with the recommendation of the Executive was mentioned as giving ground for the hope that interest in the general work of the Society would soon be much increased, and that the desirability of preparation for united action in promoting and defending the privileges of registered chemists will be more widely appreciated. In that connection the results of the action recently taken by the Society in the administration of the Pharmacy Act were reviewed at length, and it was shown that while being conducive to the benefit of the public they were also calculated to support the just claims of duly registered chemists. The decision of the High Court of Justiciary in the TOMLINSON case was especially mentioned as a decisive settlement of an important question, which ought to assist in elevating the status of pharmacy in Glasgow. This view of the matter was endorsed by Mr. WALTER PARIS in moving the adoption of the report of the Executive, who stated that the decision has already been productive of good effects, and that it meets with the hearty approval of the better class of medical practitioners in Glasgow.

In dealing with the subject of the Benevolent Fund, and urging its claims for liberal consideration by all members of the craft, and more especially by those who, having prospered, are in a position to aid their less fortunate fellow craftsmen, Mr. EWING contrasted the support given to it in Scotland with that given in England, showing that while the comparison is not flattering to Scotland, there is, on the other hand, no ground for thinking that the claims of Scottish applicants are any the less impartially considered in the distribution of the Fund. Lastly, he commended this subject to the attention of the local secretaries, who are now more numerous and better organised.

In connection with the retirement of Mr. KINNINMONT and Mr. STEPHENSON from the Board of Examiners, and that of the latter from the Executive of the Branch, complimentary reference was made to the prominent position they have occupied in Scottish pharmaceutical affairs, and to the great services they have rendered in their respective capacities.

In the reconstitution of the Executive, the only change is the addition of Mr. C. F. HENRY in the place of Mr. STEPHENSON.

The motion of Mr. NESBIT, expressing approval of the Pharmacy Act Amendment Bill, was seconded by Mr. HENRY, and both spoke of its main object as showing just and appropriate consideration for associates and others holding the legal qualification. The remarks of Mr. STORRAR on this subject also gave complete approval to the proposal to extend the privilege of full membership. While expressing at the same time his own views and the desire that other points should have been included in the Bill, he disclaimed the intention of offering opposition to it by proposing any amendment, and on the motion being put to the meeting it was adopted unanimously. Mr. STORRAR also drew attention to the alterations recently made as to the conduct of examinations, pointing out the considerations by which the Council has been influenced in adopting these changes, and expressing the hope that they would be loyally accepted and acted upon. Mr. NESBIT, speaking as Chairman of the Board of Examiners for Scotland, said that he and his colleagues were unanimously of opinion that the proposed arrangement is a good one.

## NOBLESSE OBLIGE.

UNDER this heading, the *Australasian Journal of Pharmacy* has an article on the observance of the Pharmacy Act by legally qualified persons, in which mention is made of the tradition that the people of Jerusalem kept their city clean by each one sweeping the frontage of his own house. As a parallel case, it is suggested that while the Victorian Pharmacy Board is engaged in an active and singularly successful crusade against unqualified persons for infringements of the law, those legally qualified may be profitably reminded of their obligation to regard the strict letter of the law so carefully that their claim to the control of dangerous drugs and preparations may not be discredited. The Victorian Act gives pharmacists a definite status such as is enjoyed in few English speaking countries, and in recent proceedings to enforce its provisions the attitude of the magistracy has given it great support. But our contemporary suggests that in the very strength of the pharmacist's position may be found his weakness, and adds that it would be suicidal if the careless pharmacist were to suppose there is no necessity for maintaining strictness in the conduct of his professional functions. Hence it behoves pharmacists to keep a vigilant watch upon themselves and their employees, so that there may be no grounds for the not uncommon assertion that the law as to labeling is so habitually disregarded by pharmacists as to make the prosecution of storekeepers savour of the farcical. The position to be maintained in the administration of the Pharmacy Act is very clearly put in the following passage.

> "The control of the retail distribution of poisons was not hastily vested in the pharmacist, and certainly not on the grounds that such control would be to his benefit. His claim to such control was only recognised after years of patient and persistent agitation, and then unwillingly; and if the grounds of such claim be found unstable, if in place of that intelligent supervision of the sale of poisons, for the performance of which the training of the pharmacist was said to have specially fitted him, there be found a general neglect of the plain injunctions of the statute law, it were hard to find a reasonable defence of his present monopoly. There be black sheep in all communities, and, as the common saying has it, 'mistakes happen in the best regulated families;' but while flagrant abuses of their public trust by pharmacists are happily rare, it behoves the craft to make it a special care that they shall continue so. It were a travesty upon the administration of justice if the grocer be punished, while the more culpable—because trusted and educationally informed—pharmacist, guilty of the same offence, goes scot free. The assertion that the public is safeguarded against the careless distribution of poisons because the legal custodian of them is one whose training qualifies him to be careful in their handling, becomes of small account where the assistants employed are unqualified, and where the mandate that all poisons should be labelled is disregarded. We are told that 'a nod is as good as a wink to a blind horse;' the pharmacist must be exceptionally blind to interests of vital importance if he is careless in the discharge of his plain duty to the public, to the profession, and to himself."

In another note on the sale of non-poisonous remedies by storekeepers the view is expressed that it would be highly desirable to have the sale of all preparations of a medicinal character taken out of the hands of ordinary traders. But in view of the improbability of such a result being effected by legislation it is remarked that the only means of meeting such opposition is for the pharmacist, by intelligent conduct of his business, to inspire a public confidence in his special supervision i regard to the quality of the goods which he dispenses.

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### POISON WARNINGS.

The attention recently directed in various ways to the occurrence of accidental poisoning has had the effect of stimulating inventors to the production of contrivances by which such accidents may be prevented, and careless or unwary persons warned that a bottle from which they are about to take a dose of medicine is not the right one, but that it contains a poisonous preparation intended only for external application. That object may be regarded as the one to which all the different forms of the poison bottle have been directed hitherto, and as the substitution of a belladonna or aconite liniment for medicine is the kind of mistake most commonly made, a distinctive poison bottle or some other mechanical device may be, to some extent, useful in preventing accidents from occurring in that way.

A contrivance of this kind was announced in our advertisement columns last week. It consists of a tiny bell loosely attached to the cork of the bottle to be distinguished. The tinkle of this bell when moved, on taking up the bottle, is sufficient to warn a nurse without disturbing the patient. Another form of poison bottle suggested by Dr. Quine, of Manchester, is made with a slanting neck and somewhat in the form of an infant's feeding bottle, so that it will not stand upright. Major Gamble, of Dublin, prefers to rely upon a striking red label, on which are depicted the death's head and cross-bones of the pirate's flag. These labels are now being produced in three sizes by Messrs. Silverlock. More recently it has been proposed to use a bottle made of blue glass moulded in the form of a skull, with cross-bones underneath and the word "poison" in raised letters on the forehead. In answer to the objection that such devices would be too ghastly and likely to frighten sensitive people, it is urged that they cannot possibly be too ghastly for performing the office of "a scarecrow in the field of death," and that their object is to frighten people into being cautious, since it is better to be frightened than to be poisoned.

One of the most ingenious contrivances for preventing mistakes with medicine has been devised by Mr. R. Watson Councell. The plan adopted is very simple, and while it has the great advantage of being applicable to any kind of bottle, it has the still greater merit of being entirely removable afterwards, so that the bottle can be used for any ordinary purpose. The cork of an ordinary bottle is cut in two horizontally and, before being inserted in the neck, the two portions are threaded vertically upon a piece of string the lower end of which is knotted so that the string cannot be drawn through the cork, while the upper end of the string has a label attached bearing the word "poison." When so threaded upon the string the divided cork can be put into the neck of the bottle as well as if it had not been cut in two. But on proceeding to take out the cork in the ordinary way, only the projecting upper half of it will be removed and slipped along the string upon which it is threaded. The neck of the bottle will still remain closed by the lower half of the cork, and consequently it will be impossible to pour out the contents of the bottle. A person taking up by mistake a bottle of poisonous liniment, corked in this manner, would thus be prevented from swallowing the poison instead of the proper medicine, and the circumstance that the contents of the bottle could not be poured out would indicate, even in the dark, that the wrong bottle had been taken. The most serious objection to distinctive poison bottles—viz., the possibility of being used for articles which are not poison—is thus overcome.

### BRITISH PHARMACEUTICAL CONFERENCE.

The locality where this year's meeting will take place is in many respects different from any of those at which meetings have been held in previous years. The historical associations belonging to the city of Oxford, no less than the fame of the University connected with it, and the architectural beauty of the Collegiate and other buildings, will present interest of such a various kind that it may be reasonably expected there will be a more than usually large gathering of visitors eager to avail themselves of the opportunity offered. For the convenience of those who propose to attend the meeting a series of articles, briefly describing the general features of Oxford and its neighbourhood, will be published in the Journal, the first of which will be found at page 1092.

### ENTRIES FOR THE JULY EXAMINATIONS.

We understand that the entries for the various examinations about to take place are unusually numerous, and that they exceed any numbers previously recorded. The entries for the Minor are 437, and those for the Major 51, while there are no less than 490 candidates who have signified their intention of presenting themselves for the Preliminary examination.

### INTERNATIONAL EXPOSITION AT ROME.

On September 20 next, the ninth exposition of hygienic and alimentary products, organised by the International Association for the Improvement of Hygiene (Brussels), will be opened at Rome. Information may be obtained of the Secretary, at the office of the Association, 4, rue de la Linière, Brussels (South).

### EXTRA DUTY ON SPIRIT.

In the House of Commons on Wednesday the Chancellor of the Exchequer declined to accept amendments to the Finance Bill, moved by Mr. A. Morton and Mr. J. G. Lawson respectively. The first proposed to exempt from the extra duty spirits taken out of bond for *bonâ fide* medical purposes, and the second that a drawback of sixpence per gallon should be allowed on all spirits used in the preparation or making up of medicines or drugs for medical purposes. Mr. Townsend, of Bristol, said he was perfectly certain that those who best understood the matter, and were competent to represent the drug trade, did not desire this reduction.

### HONORARY DEGREES AT CAMBRIDGE.

Amongst the honorary degrees conferred by the University of Cambridge on Wednesday were the following:—As Doctor in Science *Honoris Causa*, Sir John Bennet Lawes, Bart., F.R.S., and Sir Joseph Henry Gilbert, F.R.S.; as Master of Arts *Honoris Causa*, Mr. Ernest Clarke, F.S.A., Secretary of the Royal Agricultural Society, and Dr. J. A. Voelcker, Ph.D. (Giessen), B.A., and B.Sc. (Lond.), Consulting Chemist to the same society.

### CONGRESS OF CHEMISTRY AND PHARMACY AT NAPLES.

The fourth Italian Congress of Chemistry and Pharmacy will be held at Naples, from September 2 to 7 next, and in connection with it there will be an exhibition of chemical and pharmaceutical products and apparatus. Intending exhibitors should communicate with Professor Arnaldo Piutti, Presidente del Comitato Ordinatore del IV. Congresso Italiano di Chimica e Farmacia, Instituto di Chimica Farmaceutica e Tossicologica della R. Università di Napoli.

### EDINBURGH DISTRICT TRADE ASSOCIATION.

We are asked to announce that the photograph taken in connection with the excursion of this Association to Norham Castle, on June 13, has proved very satisfactory, and copies may be obtained from Mr. R. J. Macdougall, chemist, Leith.

### PRESENTATION TO PROFESSOR TILDEN.

The resignation of the position held by Professor Tilden at Mason College, Birmingham, during the last six years has been made the occasion of a gratifying manifestation of the esteem entertained for him by the present and past students of the College, who have presented him with an address and a handsome silver bowl (see p. 1100).

### CHAIR OF CHEMISTRY.

We are asked to notify the fact that the Council of University College, Dundee, will shortly proceed to appoint a Professor of Chemistry. The duties will commence on October 1, and applications for the post should be sent to the Secretary, Mr. R. N. Kerr, not later than July 7.

# Transactions of the Pharmaceutical Society of Great Britain.

## NORTH BRITISH BRANCH.

### Election of Executive.

A meeting of members and associates in business, of the Society, residing in Scotland, was held in the Society's House, 36, York Place, Edinburgh, on Thursday, June 21, at 12 noon. Mr. J. Laidlaw Ewing in the chair.

The minutes of last meeting were read and approved.

Apologies for absence were received from Messrs. W. L. Currie, Alexander Kinninmont, and Robert McAdam, Glasgow; and Messrs. P. Boa, A. Gibson, G. L. McGibbon, George D. Mackay, and C. A. Macpherson, Edinburgh.

### *Address by the Chairman.*

The Chairman said he had already had the honour of addressing them on two occasions, and he was glad to be able, in doing so again, to congratulate them on a further increase in the membership of the Society in Scotland. In 1887 the voters numbered 292, and there had been a small but steady increase ever since, till this year the number reached 369. This, however, was not more than a fourth of the registered men in Scotland, and there was still ample room for expansion. During the year there had been some losses through death, including Mr. William Pinkerton, who was for three years, from 1883 to 1886, a member of the Executive of the North British Branch. Additional local secretaries had now been appointed, as was recommended by the Executive. It was too soon yet to judge of the practical outcome of the new arrangement. It was hoped the members of the craft generally would give those appointed every assistance and encouragement in carrying on the work of the Society in their districts, and that there would be a much increased interest in the work of the Society. It was plain from such recent actions as that of the Patent Medicine Vendors' Association that chemists required to be on their guard, and ready to take united action when occasion might arise, and that might be accomplished through the medium of the Society's district officers. They had to regret the loss by death of one of the newly-appointed local secretaries—Mr. James Martin, of Motherwell. He took an active part in public municipal affairs in the town of Motherwell, and would doubtless have proved an efficient officer had he been spared.

### *Results of the Examinations.*

With regard to the new buildings, he had to say that they were progressing in a satisfactory way, and it was expected that they would be ready for opening in October. They would be a great improvement, and would enable the examinations to be conducted with comfort to examiners and candidates alike. Since they last met, Messrs. Stephenson and Kinninmont had retired from the Board of Examiners; but he did not now require to add to the well-deserved eulogy that had already been passed on them. This year Mr. Stephenson also retired from the Executive, and he could not allow so prominent a figure in Scottish pharmaceutical affairs to retire from active service without thanking him in their name for all he had done for the interests of pharmacy in Scotland. They would have observed that a change was contemplated in the method of electing examiners. The scheme had evidently been very carefully considered, and there was every reason to expect that it would tend to make the system of examination more efficient. The last Preliminary examination, in April, showed the alarming percentage of 59·4 failures by Scotch candidates, as compared with 54·2 by English candidates. That was rather disappointing considering that at the January examination only 35·2 per cent. of Scotch candidates failed, as compared with 45 per cent. of the English. An examination of the results during the year since last they met showed that of the Scotch 48·05 per cent. failed as against 49·28 per cent. of the English. The average failures over seven years, from 1886, in Mr. Stephenson's statement quoted last year, was Scotch 49·6 per cent., and English 51 per cent. Things were therefore a shade—but only a shade—better, and Scotland still kept the lead by about the same proportion as during the seven years previous. But the fact that nearly 60 per cent. of the Scotch candidates failed at the last Preliminary was a very serious one, and seemed to indicate something seriously wrong in the education of those presenting themselves.

### *The Sale of Poisons.*

It was not wonderful that it had taken a number of years for the restrictions on the sale of deadly poisons, passed in the year 1868, to produce their full effect. Within a certain sphere these restrictions naturally began to come into operation immediately. As other circumstances emerged, it was found that the salutary effect of the Pharmacy Act, 1868, reached far enough to secure adequate precautions in the distribution of deadly poisons to the public, in a wider sense than was made immediately apparent on the passing of the Act. A year or two ago there was the well-known Crieff poisoning case, in which, by the leakage of a vessel containing an arsenical weed killer, a quantity of sugar was so contaminated as to lead to the poisoning of several persons. The circumstances of the case on inquiry showed that these poisonous substances were being unlawfully sold by unregistered persons, who could not be expected to know the precautions required in handing and selling such articles. The Pharmaceutical Society found it necessary to take proceedings, and after a strongly defended contest in the law courts in England, it was decided that these dangerous substances could only be sold by persons certified under the Pharmacy Act, 1868, to be persons of competent skill and knowledge to be entrusted with such responsible duties. While these cases were being dealt with it was found that many scheduled poisons were being loosely sold as sheep-dips and lotions for veterinary purposes by persons not legally qualified to sell them. Again the Society found it necessary to take proceedings, and in the Linlithgow prosecutions recently it was shown that such substances as Cuff's fly oil and Cooper's sheep-dip could only be legally sold by registered persons. Quite recently, also, the Government had directed the attention of the Council to the sale of poisons by dealers in photographic appliances. The wide extent to which photography had now been adopted as a pleasant pastime had drawn attention to the danger to the public in this direction. Again the Society had to take action, and the sale of such substances as cyanide of potassium by a photographic dealer was shown to be unlawful in a case decided at Liverpool in February last. All these cases, taken along with the action of the Treasury in regard to the sale of poisons bearing the medicine stamp, and the action of the Society consequent on the action of the Treasury, went to show that the full efficacy of the Pharmacy Act as a means of controlling the distribution to the public of poisonous substances was now becoming more and more apparent. On the ground of public safety, this was a matter for much satisfaction, because it was only by the strict observance of legal restrictions that the sense of danger and the need for caution could be impressed upon the minds of persons requiring to use poisons; and the toleration of loose practices in regard to the sale of any particular class of poisons tended to open the door for looseness and illegality in the sale of poisons generally. While a strict observance of the law all round tended to secure a public advantage, it imposed no public disadvantage. Thanks to the Pharmacy Act and the action of the Pharmaceutical Society they had now a large body of thoroughly trained and competent men spread all over the country, so that in every district there were the most ample facilities for supplying, in an adequate manner, every demand for poisons and their preparations, in a safe and legitimate manner through the agency of persons duly registered by law to keep open shop for the sale thereof. The plea sometimes urged that recent prosecutions were an undue interference with trade w absolutely untenable. It was only interference with a kind of trade which the Legislature has declared to be prejudicial to the public safety, and the very purpose of the Pharmacy Act was to put an end to that trade. That was how the matter stood, looked at from the wide platform of the public interest and the public safety. But they might fairly be permitted to look at it also from the point of view of the legally authorised seller of poisons. They had responded to the demand of the Legislature, and had been at considerable pains and cost to acquire the necessary skill and knowledge required to become registered chemists, with all the rights and privileges which that statutory position implied. They could not, therefore, be reasonably accused of any merely personal or selfish motive when they insisted that other individuals should be required to give the same loyal obedience to statutory requirements that they had rendered, and they were fairly entitled to feel much satisfaction when they observed that the sale of each and every scheduled poison to the public in any shape or form, was being properly restricted to the hands of persons who had given public proof and legal guarantee that they were competent to perform this responsible duty in such a way as to secure the public safety. It was not in any sense a question of monopoly. Any man or woman might sell poisons. But he or she must first prove by proper legal evidence that he or she might be allowed to do so with safety and without danger to the public.

### *Tomlinson Appeal Case.*

But he must now refer to the highly important decision of the High Court of Justiciary in the Tomlinson appeal case. In Glasgow the state of pharmacy had been for many years notoriously unsatisfactory, mainly owing to the excessive number of chemists' shops kept by doctors. From time to time the subject had been brought under public notice by the prosecution of unqualified persons engaged in dispensing in these shops. There had been a widespread belief that a doctor could keep open shop and sell poisons by the hands of an assistant possessing no legal qualification—sometimes merely through a boy or girl—without coming under the provisions of the Pharmacy Act. The High Court decision settled once for all any doubt that might have existed on that point, and made it absolutely clear that no unqualified person could sell poison in a doctor's shop or anywhere else. As was made clear in the admirable judgment of the Lord Justice-Clerk, the view contended for by the doctors would inevitably have destroyed the purpose for which the Act was passed—not to create a monopoly, but to secure the safety of the public. That decision ought to assist in elevating the status of pharmacy in Glasgow.

### *Benevolent Fund.*

He would take this opportunity also to refer to the subject of the Benevolent Fund. That was a department of the Society's work to which, from the beginning, a very prominent place had been given, and it had undoubtedly been the means of helping in many deserving cases of temporary adversity and suffering on the part of members of the craft, or their widows and families. By the system of annuities, also, it provided a very welcome old age pension for some of the most deserving of those connected with pharmacy, who had become disabled by age and infirmity, and had no other source of income. One great feature of the charity was that, more perhaps than in almost any other charity, the money subscribed went to the charity, and was not used up in working expenses. Every case also was most carefully inquired into, so that any assistance given in this way was most likely to do the greatest amount of good. It was free from the very serious objections that applied to indiscriminate charity, which too frequently did more harm than good. Recently the Council had decided to increase the amount of the annuities, and the claims upon the Eund were so numerous and so urgent that there was ample room for a more liberal contribution from those who, having themselves prospered, were in a position to aid in this way their less fortunate fellow-craftsmen. Either because misfortune less frequently overtook the Scottish pharmacist, or because he was more provident, or because of a laudable feeling of pride and independence, it was a fact that applications for relief were less frequent in Scotland than south of the Tweed. As a consequence, the grants to Scotland were naturally fewer. This appeared to have given rise to an impression, more or less widespread in Scotland, that Scotch applicants did not receive the same consideration as English applicants, and that in fact any Scotch applicant was handicapped, and had not the same chance of obtaining relief. There was not the least doubt that any such idea was erroneous. Every case was most carefully considered by the Benevolent Fund Committee, of which the two Scottish councillors were members, and the question of nationality never for a moment was allowed the smallest weight. In fact, if there was any bias at all, it seemed rather to lean towards Scotland, just because the applications from north of the Tweed were comparatively few. This was pre-eminently a case in which all questions of nationality should be shut out of consideration, the one thought being a desire to help a brother or sister in distress. He was quite sure that no other consideration had any weight with the Council, and that it endeavoured to distribute the funds of the charity with the utmost impartiality, so that any applicant from Scotland might absolutely rely upon the most attentive and generous consideration. It was to be hoped, therefore, that no feeling of this kind would be allowed to interfere with Scotland's contributions to a fund which was so well deserving of generous support. It was worth considering whether they were doing all that might be done in this direction. Mr. Hill had prepared a note of the subscriptions for 1893 from Glasgow, Edinburgh, Dundee, and Aberdeen, and also from four English towns of about similar population, with the following results:—

| Scotch Towns. | Population. | Subscription. | English Towns. | Population. | Subscription. |
|---|---|---|---|---|---|
| Glasgow........ | 566·000 | £13 | Manchester.... | 506·000 | £51 |
| Edinburgh .... | 262·000 | 29 | Bristol ........ | 222·000 | 24 |
| Dundee ........ | 156·000 | 2 | Brighton ...... | 116·000 | 26 |
| Aberdeen ...... | 122·000 | 11 | Cardiff ...... | 123·000 | 13 |
| Total.. | 1106·000 | £55 | Total.. | 967·000 | £11 |

That was to say, the four principal Scottish towns, with a population of about one million, only contributed something less than one half the amount of four English towns representing a similar population. The comparison was not flattering to Scotland, and it was clear that they had some ground to make up. There could be little doubt that with a slight effort they could, for instance in Glasgow and Dundee, show a very different result. This was a matter that would no doubt receive the attention of the local secretaries, who were now more numerous and better organised. With regard to the grants from the Fund, it might be noted that during the last few months there had been three Scottish grants. In November, 1893, in Motherwell, the widow of a chemist, who suffered financial disaster through the failure of the City of Glasgow Bank, received £10. In April, the widow of a chemist in Edinburgh received £10. Her husband was in business thirty-seven years, and took a prominent part in the Society's affairs in the early days in Edinburgh. In June a chemist, aged 85, in Rhynie, Aberdeenshire, received £10, he having already received £30 in three grants of £10 each. These were an indication that there was no inclination to overlook the claims of Scottish applicants in the distribution of this important fund. In conclusion he had to thank them for their patient attention to what he had had to say, and he thanked Mr. Hill for much valued assistance in conducting the business of the Society during the year.

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The Assistant Secretary then read the report of the Scrutineers as follows:—

### REPORT OF SCRUTINEERS.

"At a meeting held on April 19, 1894, the Executive appointed June 21, 1894, as the date of the election for the ensuing year.

"Three hundred and sixty-seven nomination papers were issued by the Assistant Secretary on May 29.

"The nomination papers returned showed that forty-three members and associates in business had been nominated, of whom the following twenty signified their willingness to act if elected:—

Currie, William Little, 223, Byres Road, Dowanhill, Glasgow.
Davidson, Alexander, 172, High Street, Montrose.
Ewing, James Laidlaw, 52, North Bridge, Edinburgh.
Fisher, John Hutchison, 66, High Street, Dunfermline.
Gibson, Adam, East Thistle Street Lane, Edinburgh.
Hardie, James Miller, 68, High Street, Dundee.
Henry, Claude Francis, 1, Brandon Terrace, Edinburgh.
Kermath, William Ramsay, 1, North Bell Street, St. Andrews.
Kerr, Charles, 56, Nethergate, Dundee.
Kinninmont, Alexander, 69, South Portland Street, Glasgow.
Lunan, George, 20, Queensferry Street, Edinburgh.
McAdam, Robert, 34, Virginia Street, Glasgow.
McCowan, Robert Thomas, 8, High Street, Paisley.
McLaren, David, 42, South Clerk Street, Edinburgh.
Moir, James, 447, Victoria Road, Crosshill, Glasgow.
Nesbit, John, 162, High Street, Portobello.
Noble, Alexander, 139, Princes Street, Edinburgh.
Paterson, James, 15, Regent Quay, Aberdeen.
Strachan, Alexander, 138, Rosemount Place, Aberdeen.
Sutherland, John William, 68, High Street, Dumfries.

"A voting list was accordingly drawn up, and on June 11 three hundred and sixty-nine voting papers were issued.

"The Scrutineers met last night at 7 o'clock and proceeded to examine the voting papers. The Scrutineers again met to-day, June 21, at 11.5 a.m., and completed the scrutiny. The result was found to be as follows:—

| | |
|---|---|
| Voting papers issued | 369 |
| ,, ,, returned | 179 |
| ,, ,, informal | 1 |

"There were thus 178 votes to be recorded. The following gentlemen have a majority of votes:—

Currie, William Little, 223, Byres Road, Dowanhill, Glasgow.
Davidson, Alexander, 172, High Street, Montrose.
Ewing, James Laidlaw, 52, North Bridge, Edinburgh.
Fisher, John Hutchison, 66, High Street, Dunfermline.
Gibson, Adam, East Thistle Street Lane, Edinburgh.
Hardie, James Miller, 68, High Street, Dundee.
Henry, Claude Francis, 1, Brandon Terrace, Edinburgh.
Kermath, William Ramsay, 1, North Bell Street, St. Andrews.
Kerr, Charles, 56, Nethergate, Dundee.
Kinninmont, Alexander, 69, South Portland Street, Glasgow.
Lunan, George, 20, Queensferry Street, Edinburgh.
McAdam, Robert, 34, Virginia Street, Glasgow.
Nesbit, John, 162, High Street, Portobello.
Noble, Alexander, 139, Princes Street, Edinburgh.
Paterson, James, 15, Regent Quay, Aberdeen.
Strachan, Alexander, 138, Rosemount Place, Aberdeen.
Sutherland, John William, 68, High Street, Dumfries.

"The voting papers and all other documents connected with the election are submitted herewith.

"JAMES L. EWING, *Chairman*.

"WILLIAM BURLEY, JAMES PATON,
"ROBERT L. HENDRY, JOHN ROBERTSON."

The actual result of the poll was as follows:—

| | | | |
|---|---|---|---|
| Ewing | 164 | McAdam | 135 |
| Currie | 156 | Fisher | 131 |
| Kerr | 154 | Lunan | 129 |
| Kermath | 153 | Paterson | 126 |
| Strachan | 151 | Gibson | 117 |
| Hardie | 147 | Henry | 105 |
| Kinninmont | 146 | | |
| Sutherland | 145 | McCowan | 90 |
| Davidson | 143 | Moir | 86 |
| Noble | 143 | McLaren | 64 |
| Nesbit | 137 | | |

Mr. Walter Paris, Glasgow, moved the adoption of the report. Referring to what had been said by the Chairman, he said he did not know what had been the state of pharmacy in Edinburgh, but in Glasgow it had been very bad indeed. The recent action of the Society had already done a good deal to bring about a better state of things. Scarcely a day passed now but some person came in for, say, one pennyworth of laudanum, with a complaint that they had tried ever so many doctors' shops and could not get it. The doctors had apparently given orders that no poisons were to be sold except when they were themselves present in the shop. The better class of medical practitioners in Glasgow heartily approved of the decision of the High Court, but what might be called the shop-keeping class of doctors were thoroughly disgusted, and were doing their best to boycott the registered chemists. That, however, was only spite, and would pass away, and there could be no doubt th the recent action of the Society would improve the state of pharmacy in Glasgow.

Mr. James Mackenzie, Edinburgh, in seconding the motion, said that as one who had a good deal to do with past endeavours to secure the interests of chemists, he was glad to see that they were now beginning to realise more fully the position they had so long contended for. It was necessary that they should be united, and that they should actively support the Council of the Society. He regretted that a larger number of voting papers had not been returned, but it was gratifying to see that the membership was increasing. The Executive now being elected was a good representative one, and he had much pleasure in seconding the adoption of the report.

The report having been unanimously adopted, the Chairman declared that the first seventeen names on the list given by the scrutineers, together with the President of the Society (Mr. Michael Carteighe), the Vice-President of the Society (Mr. William Gowen Cross), Messrs. John Johnston, Aberdeen, and David Storrar, Kirkcaldy, as *ex officio* members, would form the Executive for 1894-95.

On the motion of the Chairman, a vote of thanks was awarded to the scrutineers.

Mr. Nesbit, Portobello, then moved the following resolution:—

> "That this meeting cordially approves of the draft Pharmacy Act Amendment Bill recently adopted by the Council, and trusts it will speedily be passed into law, and thus be the means of securing a more comprehensive union and organisation of all registered chemists."

Mr. Nesbit said the Society had great difficulties to contend with in 1868, and as a consequence the Act of 1868 was not all that it might have been. They had had to do the best they could with what they got. The policy of the Act was that all chemists in business in 1868 should become members of the Society, and he thought that was quite right, for there were many able men among the chemists and druggists outside the class of pharmaceutical chemists, and some of them had been members of the Council. At the same time, undoubtedly some were admitted to the Register as being in business who could not be classed as thoroughly competent pharmacists. Nevertheless, anyone of these could become a member of the Society and a member of Council, though they had passed no examination. This gave rise to a very great anomaly, for those who subsequently passed the Minor examination and joined the Society could never pass beyond the stage of associate in business, and could not be elected members of the Council. That was not only an anomaly, but a great loss to the Society, for many of those who belonged to the class of associates were men of conspicuous ability, whom it would be a great advantage to have as members of the Council. It was the main provision of the Bill to provide that all registered men should be members, and that, he was sure, would meet with general approval. Another provision of the Bill was that one-third of the Council should retire each year, and that the antiquated method of retiring by ballot should cease. They in Scotland were very familiar with this method of a one-third retiral each year, and they knew how satisfactorily it had always worked, and would therefore give it their hearty support. He thought the passing of this Bill, which was simple and non-contentious, would strengthen the hands of the Society, for hitherto they had been handicapped by not being able to say that they represented the entire body of registered chemists. That was one of their chief difficulties in 1868, when the United Society of Chemists and Druggists was said to have a larger membership than the Society. He had much pleasure in submitting the motion for their approval.

Mr. C. F. Henry, in seconding the resolution, said he thought the Bill was an act of justice to Minor men. At present the members of the Society consisted of two classes, pharmaceutical chemists and chemists and druggists who happened to be in business in 1868. That being so, he thought it was simple justice that those passing the Minor examination, which was now as difficult as the Major of earlier days, should be admitted to the full privileges of membership. There had been some objections to this Bill. It had been said there was danger in allowing students to become associates, because some who only passed the First examination might open shop and call themselves associates of the Society. This difficulty would be effectually met by the power which the Council possessed of removing from the Register the name of any person who acted in a manner prejudicial to the Society and if every associate on joining bound himself to abide by the rules of the Society. Objection had also been taken to the condition that the Council should not contain more than ten chemists and druggists. He thought this condition was a fair and reasonable arrangement. They had to remember that the Council had frequently to deal with outside bodies, such as the Government, the Privy Council, the Medical Council, and the various scientific societies, and he thought it would have more influence with those parties if there was a certainty that a majority of the Council possessed the Major qualification. The Council also had the control of the examinations, including the Major examination, and it was desirable for that reason also that the pharmaceutical chemist members should be in the majority provided for by the Bill. It had also been objected that the Bill did not go far enough. No doubt many of them were very anxious to see other things included; but he thought to do so would be to overload the ship and sink it in a sea of trouble. It was said they might have included such things as exemption from jury service, and the question of company pharmacy; but in the present state of parliamentary business he thought it was wiser to try one thing at a time. If they could pass this Bill it should have the effect of making chemists a more united body, and he therefore begged to second the motion.

Mr. Storrar said, though it was not strictly in order, they would allow him to thank them for the honourable position in which Mr. Johnston and he had been placed in the last Council election. He rose to explain why he had, and still did, express a doubt as to the wisdom of going on with this Bill. He entirely sympathised with the object of the Bill, and agreed in the main with what had been said by the mover and seconder of the resolution. He most cordially approved of the proposal to extend the privilege of full membership to all registered chemists. His objection was not to anything in the Bill, but rather rested on what was not in the Bill. Mr. Henry had said they should not overload the ship, but he (Mr. Storrar) thought they should see that the ship carried a fair cargo. To make a voyage with one thing at a time, as was proposed, would not yield a satisfactory interest on the transaction. The main argument in favour of the Bill was that it would enlarge the Society and induce many additional members to join. He doubted very much if it would have that effect, and therefore he did not think it was worth the trouble and expense that would be required to pass it. They said this was only preliminary to some further legislation, but he did not think they could immediately go to Parliament with other Bills after the passing of this one. He thought they might have introduced a Bill dealing with such matters as education, examinations, and company pharmacy, and containing a clause extending membership to all chemists and druggists. The other course was so long that they would not in their day see much of the objects they had in view. At the same time he had no idea of proposing any amendment to the motion, because the object of the Bill had his entire sympathy.

Mr. Mackenzie said, with reference to what was said by Mr. Nesbit, he was one of the 1868 chemists and druggists, and he thought the passing of the 1868 Act was largely due to the energy and perseverance of the United Society of Chemists and Druggists. He had long ago suggested that there should be a clause making it illegal for any unregistered person to derive pecuniary benefit from an open shop for the sale of poisons. That was the key to the situation in dealing with the stores. He thought the passing of this Bill would do good by increasing their numbers, the great importance of which he had personally experienced in dealing with members of Parliament and of the Government. He would like to say, also, that they should not only pass this resolution, but should actively do what they could to back up the Council of the Society. It was useless to introduce a Bill into Parliament unless they exerted themselves to have it passed, and he thought they should all put their shoulders to the wheel.

The resolution was then put to the meeting and unanimously adopted, the Chairman stating that he entirely approved of the resolution, and thought it would be useful as paving the way for future attainments.

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The Chairman said he had much pleasure in introducing to the meeting, and in their name giving a welcome to, Mr. F. J. Wulling, Dean of the Faculty of Pharmacy in the University of Minnesota, at Minneapolis.

Mr. Wulling said he highly appreciated their very kind reception. He had come to Scotland partly in search of health, and also to see what was being done in the teaching of pharmacy. He intended to visit England and the Continent in the same quest. He had listened with very great interest to what had been said, and he found that the questions that seemed most to occupy the attention of pharmacists in this country were practically identical with what they were considering in America. They had a great deal still to do in developing pharmaceutical education in the Central and Western States in America, and he was actively engaged in that work in the University of Minnesota, where they had a department of pharmacy in association with the department of medicine. He was fortunate in being able to attend their meeting, and thanked them very much for the opportunity.

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Mr. Storrar said he would like to say a word about the recent scheme adopted by the Council as to the conduct of the examinations. It had been considering the matter very carefully for four or five months, and though at first he thought little alteration was required, he had gradually been convinced, as all members of the Council were, that some such alteration was absolutely necessary. There was a general feeling that the duty of examinership should go round, and that part of the scheme limiting reappointment seemed to commend itself without much argument. A more radical change was the proposal to introduce outside examiners, and it was one more open to be misunderstood. There was not in the mind of any one the slightest suggestion of casting any slur on the present examiners, who enjoyed the most implicit confidence of the Council. The Council had to consider, however, that a system which might be quite suitable for a purely voluntary society was not sufficient when the society had become a national one, entrusted with public duties. The Council had to satisfy the public, the Government, and those belonging to the trade outside the Society, and it was believed that the new arrangement, which was in consonance with the practice of other examining boards, would be beneficial. It was an open secret, too, that there was a power behind the Council which had to be counted upon. The plan was, in a measure, an experiment, and the power which made it could unmake it if it did not fulfil expectations. He trusted it would be loyally accepted and acted upon by the members of the Society and by the Boards of Examiners.

Mr. Nesbit, as Chairman of the Board of Examiners for Scotland, said for himself and his colleagues he was in a position to say that they had considered this matter at their last meeting, and were unanimously of opinion that the first proposal was a good one, and would work beneficially. They were not all so sure about the plan of having outside examiners, but they thought that, too, might turn out to be an advantage. They would not raise any objection to it, but accept the arrangement in a loyal spirit.

Mr. James Paton moved a vote of thanks to the Chairman, and Mr. D. McLaren moved a vote of thanks to the retiring Executive. Both votes were cordially passed, and the meeting then closed.

# Provincial Transactions.

## MASON COLLEGE, BIRMINGHAM.

### PRESENTATION TO PROFESSOR TILDEN.

On Monday evening last, at Mason College, Birmingham, Professor Tilden, F.R.S., was the recipient of an address and a handsome silver bowl, presented by the past and present students of the College, as a mark of their esteem, on his removal to the Royal College of Science, London.

Mr. A. J. Cooper, a past pupil of Professor Tilden, presided, and the ceremony was attended by nearly the whole of the teaching staff, in addition to a large assemblage of students.

The Chairman referred in eulogistic terms to the ability and courtesy of Dr. Tilden, and said that although Birmingham was losing him, they hoped he would be spared for many years to continue his work in his new sphere of labour.

Mr. Rose, a present student, bore testimony to the admirable relations which had existed between Dr. Tilden and his pupils, and also to the wonderful faculty their departing teacher possessed of imparting knowledge to all those who came under his influence. Their loss would be the gain of the Royal College of Science, and it was admitted in the high sphere of labour Dr. Tilden was about to enter, he would have greater opportunities of pursuing his own work and also of benefiting others who, like themselves, were desirous of fathoming the depths of chemistry.

Mr. Emanuel, on behalf of the medical students, and a lady student, also added words of appreciation. The latter said that mainly through Dr. Tilden's perseverance it had been made possible for ladies to become members of the Institute of Chemistry.

Mr. Miller said that as one who had been with Dr. Tilden for nearly six years, he could say that he had not only had an influence on the teaching of Mason College, but also on the teaching of chemistry to the outside student. His works on chemistry, he ventured to say, ranked amongst the most valuable.

Dr. Heath (principal of the College) said that eighteen years ago he was a pupil of Dr. Tilden's at Clifton College, and he could cordially second all that the students had said of his clearness of exposition and enthusiasm for every subject he took up. Dr. Tilden had had a long and honourable careeer, and to them his loss would be felt in every department of college life. He had conferred distinction on the College by his remarkable personality and scientific eminence. By dint of unremitting labours and keen insight and imagination he had built for himself a scientific reputation which was as wide as the country. He had been one of that close body of scientific counsellors, the Royal Society, and for three years he had occupied the honourable position of president of the Institute of Chemistry.

Mr. C. J. Levi, chairman of the College Chemical Society, then made the presentation.

Dr. Tilden, on rising to reply, was enthusiastically cheered. He remarked that they made him feel that day so very much how strong were the ties that united them. He spoke of his connection with the College for fourteen years—a connection which began really before the building was completed—and said that he had always enjoyed his teaching and work among them in the College; but whatever success they thought he had achieved—whatever success in teaching—he could not forget how very much he owed to them all, and to the able assistants with whom he had been associated. He specially wished to mention Dr. Nicol, who for thirteen years had been his right hand, and a more faithful, loyal coadjutor he did not think any man could have had. He desired to say a word as to his successor. They had got coming to take his place a very distinguished teacher—a very distinguished son of a still more distinguished sire. Dr. Frankland had already made a considerable reputation, and during the last few years had given a good deal of time to investigations of a valuable nature. He thought in his hands the science of chemistry would certainly advance. In conclusion, he heartily thanked them for the handsome presents they had made him.

## Parliamentary and Law Proceedings.

### POISONING CASES AND INQUESTS.

Accidental Poisoning by Carbolic Acid.

On Monday, June 25, Mr. F. A. Jones, deputy county coroner, held an inquest at the Old Swan Inn, Broadgreen Lane, Old Swan, Liverpool, on the body of William Shaw, a member of the county constabulary, who had died from the effects of drinking carbolic acid.

Police-constable Henderson said that at 3.30 on Friday afternoon deceased came off duty at the Old Swan Police Station, and said he was very dry and could do with a pint of ale. Witness, who had seen a bottle in the boot-room, replied that there was a bottle of ale in that place. Deceased went to that room and returned with his lips very pale. Witness asked if anything was wrong with deceased, and deceased then inquired what the bottle contained that he had been drinking from. Witness returned with deceased to the boot-room, and found that he had been drinking from a bottle containing carbolic acid. There was a bottle in the room which had contained beer. When it was found what deceased had been drinking two doctors were called in, but deceased died before their arrival.

Police-constable John Lings stated that he came into the police station and saw deceased. Having spoken to Henderson, witness asked deceased what was the matter with him. Deceased replied, "I have been drinking carbolic acid in mistake for beer." Witness asked him if he could not smell it, and deceased replied, "I did not till I got it in my mouth." Deceased added, "It has not gone further than my lips and tongue; if I had swallowed any I would have been dead by now." Some sweet oil was given to deceased. Witness remained with the man until he died, and everything possible was done to save the poor fellow.

The coroner, in summing up, pointed out the possibility of a mistake being made in taking carbolic acid for beer or porter owing to the similarity in smell.

The jury returned a verdict of "Death from misadventure, the deceased having mistaken carbolic acid for beer."—*Liverpool Mercury.*

Accidental Poisoning by Carbolic Acid.

A blacksmith named John Forsyth Gunn, aged forty-eight, died in Edinburgh Royal Infirmary about midnight on Saturday last from the effects of his having accidentally swallowed a quantity of carbolic acid in his own house, at 27, North Richmond Street, less than an hour before.—*Scotsman.*

## Reviews and Notices of Books.

Materia Medica, Pharmacology, and Therapeutics—Inorganic Substances. Second Edition. By Charles D. F. Phillips, M.D., LL.D., F.R.S. (Edin.). Pp. i.-xiv. 1 to 898. 21*s.* (London: J. and A. Churchill, 11, New Burlington Street.

It is no easy task at the present day to write a book on materia medica and therapeutics which will fill a place unoccupied by any existing work, and embody fully the results of modern investigation as well as set forth clearly and well the time-proven and venerable results of experience. Difficult as is the task, Dr. Phillips has accomplished it with signal success for one half of the materia medica, and the handsome volume before us awakens the hope that the promised sister volume on the organic substances will soon be completed.

To those occupied with the preparation of drugs the work affords clear indications of the substances most needed by medical practitioners, and suggests the most convenient forms in which they are to be used. To those engaged in the practice of medicine the crystallised results of much research and the valuable personal experience of the author appear on every page, and are made applicable in emergency by an admirable index.

The physiological action of drugs is given in the graphic manner originated, we believe, by German writers, *i.e.*, the local actions (if any) are described, and then the effects of the drug are traced in the alimentary canal, in the blood, and in the various tissues, and, lastly, the mode of elimination is explained. These sections, though brief, are all that could be desired, the results of the latest published work being incorporated in them. But the physiological actions of the drugs are subordinated to a detailed notice of their therapeutical action under the headings of the separate morbid conditions. The excellence of this practical portion of the work, seconded by a faultless index, gives the book a just claim to a place in every medical library. These sections are made to embody the results of the latest clinical records, and the fullest references are given to direct the reader to the various sources from which they have been gleaned. Thus the book is especially adapted to the wants of the busy and progressive medical practitioner.

The chapter of the book which deals with baths is of especial merit, and is likely to be of the greatest assistance to practitioners as a safe guide not only to the therapeutical indications, but also to the suitability of the different localities to various types of patients.

The completeness of the work is shown in chapters such as that on oxygen, a gas which is, perhaps, too seldom thought of as a remedy. From the latest physical experiments of Dewar to a full discussion of the practical applications in disease, all is fully considered. The various applications of water are also admirably dealt with, and we are glad to find the virtues of the cold pack and the cold bath duly enumerated, nay more, the very valuable cold enemata so successfully practised in America for choleraic diarrhœa the author has tested, and found serviceable in this condition. The value of the same remedy, as recommended by Wenzel in tropical dysentery, is also duly noted.

The separation of the materia medica into inorganic and organic substances entails a certain amount of inconvenience. Thus a substance like ichthyol, now so extensively and successfully used both as an internal and as an external remedy, would most appropriately be considered under the head of sulphur, which constitutes one fourth of the weight of the compound, and gives it most of its virtue. No doubt the second volume will give a full account of this substance, and the inconvenience will be minimised by another excellent index, still, we cannot but think that it would be better described with sulphur.

The form, type, and general arrangement of the work leave nothing to be desired.

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ODOROGRAPHIA. A NATURAL HISTORY OF RAW MATERIALS AND DRUGS USED IN THE PERFUME INDUSTRY, INCLUDING THE AROMATICS USED IN FLAVOURING. INTENDED FOR THE USE OF GROWERS, MANUFACTURERS, AND CONSUMERS. By J. CH. SAWER, F.L.S. Second Series. Pp. 523. London: Gurney and Jackson, 1, Paternoster Row.

This second instalment of Mr. Sawer's useful work has been prepared with the same careful and painstaking industry which characterised the previous volume, and it contains a mass of valuable information, with copious references to the sources from which it has been obtained.

The first section, extending over 346 pages, is devoted to Nutmegs and Mace, Sassafras, Massoi, *Solidago*, *Laurus benzoin*, *Canella alba*, Winter's Bark, Pimento, Bay, Myrtle, Lindera, Kapur Kachri, Zedoaria, Galangal, Ginger, Grains of Paradise, Angostura, Cardamom, Coriander, Caraway, Dill, Cumin, Thyme, Azowan, Basil, Anise, Fennel, Elemi, Angelica, Toddolia, Mint, Buchu, Chamomile, Tansy, Eucalyptus, Spikenard, Boldo, various kinds of odorous woods, Myrica, Ladanum, Acorus, Calamus, Souchet, Wintergreen, Spiræa, Salicin, and Populin. The plants here named and the products obtained from them are fully described as regards their physical characters and chemical composition, the results of the numerous researches which have recently added so much to the knowledge of essential oils being summarised in a very intelligible manner.

The second section treats of oils which are products of fermentation, and the third section deals with products of the action of heat on organic materials, as in various kinds of destructive distillation. The fourth section contains supplementary information relating to the subjects already treated of in the first volume, and the last sixty pages describe the botanical characters of a large number of plants which are capable of supplying floral perfumes.

The author acknowledges his indebtedness to Messrs. Schimmel and Co., of Leipsig, for much valuable information, which could scarcely have been obtained from any other source.

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MICRO-ORGANISMS IN WATER, THEIR SIGNIFICANCE, IDENTIFICATION, AND REMOVAL. By PERCY FRANKLAND, PH.D., B.SC. (Lond.), F.R.S., and MRS. PERCY FRANKLAND. Pp. i.-xi., 1 to 532. Illustrated. 16*s.* nett. (Longmans and Co., London.)

This is probably the most complete and thorough work yet published on the subject of which it treats, and, though it deals specially with one only of the numerous aspects of bacteriological science, it may well serve as an introduction and systematic guide to bacteriology generally. For, in the first place, the authors give a survey of all the more important general methods of bacteriological study—sterilisation, the preparation of culture media, the staining and microscopic examination of micro-organisms—before describing in detail those that are specially applicable to the examination of water. The descriptions of technical methods are very clear and complete, and illustrations are introduced wherever requisite. At the same time the pages do not overflow with descriptions of methods—good, bad, and indifferent—that puzzle the inexperienced by their diversity and the lack of indication as to their relative value. The processes described are really practical ones that can be depended upon to give satisfactory results. The chapter on the examination of water for micro-organisms may be regarded as an authoritative one, for this is a subject that Dr. Frankland has made peculiarly his own, and he is one of the leading authorities on the subject in this country. Subsequent chapters are very complete summaries of the work that has been done by numerous investigators on the bacterial contents of various waters, the purification of water for drinking purposes, the multiplication of micro-organisms, the detection of pathogenic bacteria in water, the vitality of particular pathogenic forms in different waters, and the action of light on micro-organisms. But, in addition, they also embody the records of much original and useful work by the authors, the particulars of the remarkable experiments illustrating the action of light on minute forms of life being exceedingly instructive and interesting. Finally, in a bulky appendix of over one hundred and twenty pages, concise descriptions are given of more than two hundred micro-organisms that have been found in water, pathogenic forms being specially indicated by the use of red ink for the headings. Each organism is treated under several heads—authority, where found, microscopic appearance, cultures, and remarks—and this is done in such a way as to justify the authors in their hope "that this descriptive catalogue may prove of value in the at present bewildering task of identifying the different microbial forms met with in natural waters." The work as a whole is really beyond criticism, especially when the magnitude of the task involved in its publication is taken into account, and it cannot be praised too highly. For some time to come it cannot fail to be the standard authority upon the subject of micro-organisms in water.

**The Natural History of Plants. By Anton Kerner von Marilaun and F. W. Oliver, M.A., D.Sc. Part 2. Pp. 113 to 224, with coloured plate 2*s*. 6*d*. nett. (Blackie and Son, London).**

In the second instalment of this excellent work, the consideration of the absorption of organic matter from decaying plants and animals is continued, a specially interesting section dealing with plants that employ traps and pitfalls to ensnare animals. Carnivorous plants are then classified according to the methods adopted for securing prey, the illustrations of the various modified plant organs being remarkably well done. Parasites are next classified into three groups, which are described in detail. The first includes all microscopic plant-forms living in the interior of human beings and animals, and generally spoken of as bacteria; fungi possessing mycelia comprise the second group; and flowering plants that live upon other plants the third. Following upon the details of the last-named, a description is given of the processes of grafting and budding, and the final pages deal with the absorption of water by lichens, mosses, and epiphytes. The standard of excellence is fully maintained throughout.

## Correspondence.

### Rhubarb.

Sir,—Noting your communication from Dr. Hesse regarding his investigation of "Rhubarb," it is perhaps well that I also should make known that I am writing on the same drug. I do not anticipate that our experiments will overlap much, as my observations are confined to such as come within the work of a practical pharmacist. Though I do not omit to notice chrysophanic and cathartic acids, I only recognise them as bodies regarding which more precise information is much wanted, and being unable to undertake their investigation myself, I am much pleased to think that Dr. Hesse will add more light where I can only indicate the want of it. My experiments are almost finished, and my paper is nearly ready. I do not think that anything it contains will much affect the work Dr. Hesse has in hand, but if he likes to communicate with me, I shall have pleasure in giving him a brief indication of the ground I go over. And I would suggest that other pharmacists having points noted which bear upon the same drug would do well to send them to the Conference.

11, *Grey Street*, Barnard S. Proctor.
*Newcastle-on-Tyne.*

### The Revision of the British Pharmacopœia.

(*Concluded from page* 1084).

*Spt. Æther Nit.*—There is too much copper wire ordered in the B.P. for making this. Less than half the quantity would be sufficient.

*Syrupus.*—Every time this is made a scum inevitably rises to the top. This can be avoided by making it with

| | |
|---|---|
| Refined sugar | 6 |
| Boiling distilled water | 8 |

Pour the water over the sugar, stirring frequently until dissolved. When cool, add water, if necessary, to weigh 9 and measure very nearly 7. In this method it does not need making up with water, as the medium seems to have been struck between a saturated syrup and one prepared by percolation.

*Syrup. Eastoni* (non-official).—Should be official, as there is a great demand for it, although there are many formulas for the same syrup. Dr. Easton's original formula need not be departed from, but it requires an addition, namely, bicarbonate of sodium, to neutralise the sulphuric acid set free when solution of sulphate of iron and phosphate of sodium are mixed together, as in syrup ferri phosph., B.P. When the quinine is precipitated by the ammonia, there must be a slight loss of alkaloid after the operation of carefully washing it is performed. Why not dissolve the always-at-hand sulphate of quinine right away in the phosphoric acid, which method I have since noticed is official in the new U.S. Pharmacopœia, although it has occurred to me long ago. In regard to the strychnine, it requires to be finely powdered in a mortar before it is rendered soluble by the acid. I have found that the sugar acts as a protective "guard" if it is first dissolved in the diluted phosphoric acid containing the phosphate of iron before the quinine is added. The B.P.C. formula has a great tendency to get *en masse*, owing to the strychnine and phosphate of quinine being dissolved in too concentrated a menstruum. Finally, the introduction of phosphate of quinine is needless, since we have already a sulphate sufficiently serviceable.

*Syr. Ferri Iodidi.*—The boiling with part of the syrup is entirely unnecessary. In regard to the little heat used to effect combination between the iron and iodine, this also is unnecessary; in fact, the energetic action requires to be modulated by keeping the flask in cold water, in this way coinciding with the recent researches of Professor Dewar, which point to the conclusion that chemical action goes on slowly at low temperatures. A good method is to use half the quantity of water ordered, and put this with the iodine and iron, and the other half to wash out the flask and filter. In the first instance, plug the neck with cotton wool, so as to prevent the volatilisation of the iodine by the great heat, and when the action commences and the liquid gets hot, set the flask in cold water. After all action has ceased, gently heat the flask until the liquid becomes of a sea-green colour. Filter into cold syrup, and wash the filter with the water already mentioned. Too much iron is ordered in the B.P.

*Syrupus Sennæ.*—It has been asserted by competent authorities, such as Dr. Inglis Clark in this country, and Dr. Squibb in America, that heat has an injurious effect on all medicinal organic substances. The present B.P. method of making the above comes under this category, and it has been rightly described by Groves, I believe, as a stewing process. It is not necessary to have the leaves broken small in order to extract the water-soluble active principle of senna, and a process such as the following has been found to answer well:—

| | |
|---|---|
| Senna | 16 ozs. |
| Oil of coriander | 3 minims. |
| Refined sugar | 24 ozs. |
| Distilled water<br>Rectified spirit | of each a sufficiency. |

Macerate the senna for twelve hours in a covered vessel with 16 ozs. of a mixture of equal parts of rectified spirit and distilled water. Press out the liquid, and to this add the oil of coriander, previously dissolved in ½ fluid drachm of rectified spirit. Break up the marc, adding a sufficiency of distilled water, so that when again pressed and the liquid mixed with the first portion the product may measure 16 ozs.; allow to stand for a few hours, filter, and wash the filter to make 16 ozs. Percolate through the sugar. Objection may be taken to the amount of spirit used, but half the quantity will not do on account of the mucilage in the leaves. The extraordinary popularity of pulv. glycyrrh. co. is certainly due to the senna containing intact its active principles, the cathartates of magnesium and calcium, without being subjected to destructive heat. I find that if sufficient time is given for the liquid to stand, the spirit has a dividing action on the mucilage, so that 4 ozs. of spirit for 16 ozs. of leaves, as advocated by Groves, will do if a little patience is exercised. The method for the above has been suggested by a paper read by Dr. Symes, entitled "Extraction by Pressure," in the Journal, September 22, 1888.

*Syrupus Tolutanus and Syrupus Scillæ.*—Percolation has been adopted by the new U.S.P. for making syrups, and, as far as I remember, this method was first put forward by Stephenson at a meeting in Edinburgh in a paper on "Syrup of Tolu by a new Process," and prepared in a somewhat similar manner to the following. The only modification of his formula is to take away 4 parts from every 32 of sugar, making 28, as otherwise the sugar is not all dissolved, and also to wash out the filter with water to make 16, after maceration and filtration are completed.

| | |
|---|---|
| Balsam of tolu | 1¼ oz. |
| Refined sugar | 24 ozs. |
| Water | 16 „ |

Reduce the balsam to powder by triturating with 4 ozs. of the sugar. Macerate with the water for twenty-four hours with occasional agitation, and filter, passing a sufficiency of water through the filter to make 16 ozs. Percolate through the sugar. This process of percolation could be applied in a similar manner to syrupus scillæ. The resulting syrups would have a sp. gr. not much less than the B.P. syrups, which are prone to crystallise owing to over-saturation, and possibly the above improvement would strike the "happy medium."

*Theriacum.*—It is curious that treacle in Scotland is black in colour, resembling saccharum ustum in appearance. The English treacle is known in Scotland as golden syrup.

*Tr. Chlorof. et Morphinæ.*—A synonym for this preparation would be desirable.

*Tinct. Kino.*—It seems rather peculiar that a sample I have of '67 tincture keeps liquid, while the '85 is *en masse*.

*Tinctura Myrrhæ.*—Percolation is unnecessary for a gum-resin such as myrrh, since the spirit dissolves the resin by simple maceration for a few days.

*Tinctura Opii versus Liq. Opii.*—The tincture of opium seems to be superseded by numerous sedative tinctures and liquors which have arisen, and this may be due to the fact that the spirit takes up objectionable matters, as resin, caoutchouc, gummy substances, etc. I suggest to have the opium cut up into thin slices and infuse with hot distilled water, so as to bring it into its neutral condition as juice, which has been called such by the Pharmacopœia. In order to do this, the liquid should be kept warm and the opium thoroughly broken down with the hand to soften every part. Then, after macerating for, say, forty-eight hours with occasional agitation, to the *filtered* liquid a sufficiency of rectified spirit added to preserve it. As medical men nowadays wish a sedative preparation, the above would be practically a solution of meconate of morphine in its natural condition as existing in opium. In regard to ext. opii liquid, which is a similar water soluble product, the amount of heat required to produce the solid extract will certainly have an injurious effect, giving rise to secondary products, and thus be totally different in its medicinal action to the natural salt. Instead of the tincture of opium being kept "on the shelf," it would be as well to improve matters so as to obtain a sedative solution of opium that will coincide with the requirements of medical men.

*Ung. Acid Boric.*—The hard paraffin is objectionable on account of the lumpy condition of the resulting ointment, and some doctors prefer to replace it with wool-fat, and the strength increased to 1 in 5. I believe wool-fat would be too expensive for such a universally used ointment, and suggest lard instead, as in the following:—

*Ung. Acid Boric.*

| | |
|---|---|
| Boric acid in fine powder | 1 |
| Soft paraffin | 2 |
| Lard | 2 |

A good method to prepare it is, as soon as the fatty basis is melted, to put a sufficiency while hot into a mortar with the boric acid in subtle powder, and then to mix quickly to form a soft and smooth ointment. Transfer this to the melted fat, and stir till cold. This is practically the way in which ointments on the small scale are made at the dispensing counter.

*Ung. Atropinæ.*—I would regard chloroform as a better solvent of atropine than rectified spirit, and when dissolved to mix gradually with the benzoated lard.

*Ung. Hydrarg. Nit.*—The temperature at which this ointment is to be made (about 212° F.) may be the cause of its proneness to darken in colour, owing to the reduction of the nitrate of mercury. I have observed that a much lower temperature, say about 180° F., is all that is required, along with plenty of stirring, as the nitric acid oxidising the lard and olive oil must of necessity cause an evolution of heat. With the above modifications this ointment retains for a long time it beautiful lemon colour, which reminds one of the phrase, "A thing of beauty is a joy for ever."

*Ung. Zinci. Oxid.*—The above *modus operandi* could be applied to this ointment.

*Vinum Ipecacuanhæ.*—The use of distilled water is quite unnecessary, because the ipecacuanha being macerated with the acetic acid, the acetate of emetine so-called is supposed to be formed, and by now evaporating to dryness over a water-bath, excess of acid is driven off, leaving the salt (?) intact. So long as the percolation with water and subsequent evaporation is pursued, pharmacists will continue to use fluid extracts and powdered acetic extract of ipecacuanha to make the wine. It is with a view to simplify matters that I append the following working formula which, by the way, is the best method to put on paper in order to convey to the reader at a glance what is meant:—

| | |
|---|---|
| Ipecacuanha in No. 40 powder | 1 |
| Acetic acid | 1 |
| Sherry | 20 |

Thoroughly mix the ipecacuanha with the acetic acid, and macerate for twenty-four hours. Evaporate to dryness over a water-bath. Powder the residue and macerate it in the sherry forty-eight hours, with occasional agitation. Filter, and pass a sufficiency of sherry through the filter to produce 20.

*Vinum Opii.*—I understand some oculists object to the aromatics, probably because of the smarting effect to the eyes when used in eye lotions, and as it is generally used for this purpose, it would be as well to meet their wishes.

*Preservation of Hypodermic Injections, etc.*—Aq. chloroformi is suggested as probably not so objectionable a preservative as camphor water for hypodermic injections, and such as liquor atropinæ sulph. and liquor cocainæ hydrochlor. (the latter is preserved by salicylic acid). I do not believe oculists would object in the case of eye drops.

*Preparation of Normal Solutions for Volumetric Analysis.*—Sutton prefers sulphuric acid for the standard acid solution, as the purest acid that can be found.

In conclusion, I would take this opportunity of saying that a decided protest should be put against the number of synthetic compounds designated anti this and anti that, and such like isomerism of the paraffinic aldoximes which are flooding the country. I move that attention should be paid to the extraction of the compounds already formed in Nature's research laboratory which, without doubt, have a better therapeutic effect, and certainly doctors and pharmacists would not be under the necessity of having so many uncouth names to remember.

*Inverness.* JOHN MITCHELL.

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Sir,—Having on hand a few notes relating to the above subject—notes which I have made at various times according as my own experience seemed to dictate—I think it right to send them you at length in consequence of your suggestion in the *Pharmaceutical Journal* of June 16.

*Acetum.*—Why not omit this article?

*Acetum Scillæ.*—In the formula, instead of "squill bruised" read "squill in coarse powder," this would condemn the using up of damp stock in its preparation, and make it easier, perhaps, to purchase the article in a brighter and clearer state than is now customary when one is too busy to prepare it for himself.

*Acidum Sulphuricum.*—Why not expunge this, the commercial stuff, and insert the pure article, which can now be procured very cheaply? The tests would then have to be modified thus: "evaporated in a platinum dish it leaves no residue;" "when diluted with pure water in the proportions for preparing the diluted sulphuric acid no sediment is perceptible after the lapse of twelve hours."

*Acidum Sulphuricum Dilutum.*—Anyhow, let this be prepared with the pure acid, for lead impurity usually means other impurities as well, and if this be allowed, others will have to pass muster with it, as they do at present.

*Acidum Sulphurosum.*—We cannot get thirty ounces of water into a pint bottle, and, by the bye, why should one be so sparing of his aqua pura as to think of using ordinary water for his two-ounce wash bottle?

*Alcohol Ethylicum.*—Synonym "absolute alcohol," and yet it contains from 1 to 2 per cent. of water, as indicated by the sp. gr., ·797 to ·800. Why not insert the proper article of sp. gr. ·795, which costs only 8*d.* per pound more, and the pharmacist would be introduced into new fields of delight by seeing the coyness with which pure alcohol mixes with pure water, and its varied behaviour with oils, essential or fixed.

*Aquæ Anethi, Anise, Carui, Cinnamomi, Fœniculi, Menthæ Pip., Menthæ Vir., Pimentæ.*—These may all be produced most successfully by the following procedure:—Let 30 grains of pure cotton be uniformly impregnated with 10 minims of the respective oil, plug this tightly into the tube of a 30-oz. earthenware funnel, and pass through the whole 1 pint of pure water. Distillation being unnecessary, is also objectionable, from the difficulty of keeping distillatory apparatus perfectly clean throughout its entire organism. A separate still is required for each product, and even then the product would vary with the age and other various conditions of different samples of drug employed, and never keep in the bargain. Having tried repeatedly the rubbing down with calcium phosphate, and every other process recommended from time to time, I am convinced that none are nearly as satisfactory as the one advocated above.

*Aqua Destillata.*—This should be aqua pura, and named accordingly. The term "distilled water" is not enough distinctive. Let it be obligatory to keep a still entirely for the preparation of pure water, never mind its size, or the material of which it is made. Let the water used answer to the tests given under the article "Aqua," and there will be no need whatever for any complexity by treatment with permanganate, or any preliminary doctoring process. The simple direction that the first tenth part of the distillate be rejected, and the last tenth of the fluid be left in the still as useless, covers everything, if the process be conducted in a cleanly manner.

*Ferrum.*—The retention of this, the commercial article, common iron wire, even common nails, seems to me a blot upon our escutcheon which demands rectification, even though pure iron wire were dearer than it is. Until the various impurities of iron are excluded *ab initio* there will be no end to the perplexity of iron mixtures not keeping bright and good, and other curious troubles about iron salts that show up from time to time and elude all explanation.

*Glycerinum Boracis.*—Neither rubbing nor the application of heat is requisite. Put the ingredients into a flask, and whirl them about for a little while until solution is effected.

*Linimenta.*—Surely it is time that this pseudonym should be attended to and retained for such preparations only as are not to be rubbed in, *e.g.*, lin. calcis. The more proper term for the rest being "embrocationes."

*Liquor Calcis.*—Keep it in by all means, but let it be prepared in a chemical manner, with pure lime hydrate, half an ounce of which to the gallon would be plenty.

*Liquor Calcis Saccharatus.*—If it is thought necessary to retain this, prepare it also with pure lime, 2*s.* 6*d.* per pound, and it will keep good for ever.

*Liquor Ferri Dialysatus.*—For "solution of dialysed iron" read "dialysed solution of iron."

*Liquor Plumbi Subacetatis Dilutus.*—Let the directions run thus:—Mix and let any sediments subside. Pour off the clear liquid and preserve it in a glass stoppered bottle.

*Liquor Strychninæ Hydrochloratis.*—My decided opinion is that but a very slight variation is required in the directions for the preparation of this most useful article. If the big manufacturer wants to prepare it by the hogshead he must look after himself. The pharmacist who prepares for himself as much as possible, and takes due care of his own productions, does not multiply by too high a factor the proportions given in his guide; he does take a glass flask, but he does not powder the crystals, he uses as little heat as possible for complete solution, he adds the spirit when the liquor is quite cold, and makes up the exact volume with a little pure water. He keeps it in a temperate climate, neither along with his lime water at the bottom of his pharmacy, nor with liquefied carbolic acid at the top (for temperature increases with altitude in a chemist's shop), and whenever a quantity is measured out the lip of the bottle is wiped with a clean cloth, thus all mysterious desposit is prevented here, as well as any re-crystallisation down below. The specific gravity should be stated for this article.

*Mel.*—Should be "mel anglicanum." Anyone may obtain abundance of English honey in the virgin state at the right season of the year, which should be kept strictly under the eye of the master until the season comes round again. This not necessarily for sale, but for use in pharmacy. Our preparations, notably "mel boracis," would then be of uniform character, all the various foreign honeys differing amongst themselves so much as to be unsuitable for our purpose.

*Mel. Depuratum.*—Should be altogether expunged. After honey is liquefied and strained, its properties become completely changed in many respects; further, the process is quite unnecessary, for any objectional débris in virgin honey subsides upon "setting," or remains at the top, and may be completely removed.

*Oleum Terebinthinæ.*—For the expression "rectified, if necessary," leave out "if necessary." Also amongst the characters strike out "which varies in the different kinds," for can anything be more distinctive than the odour of rectified oil of turpentine? I think some test might be devised, based upon the solubility of oil of turpentine in spirits of wine when a little camphor is present, but business precludes my investigation of this subject at present.

*Oxymel, Oxymel Scillæ.*—Both should be prepared with "vigin honey" instead of "clarified honey." So, by the bye, should "boracis mel" be.

*Pulvis Glycyrrhizæ Compositus.*—Instead of "fennel fruit one ounce," say "oil of fennel ten minims." Let it be made with decorticated liquorice root, and the proportion of sugar increased from 6 to 7 ounces to preserve a uniformity of strength with its predecessor.

*Rosinæ.*—Of this the English is surely "rosin." "The rosin left after the distillation, etc.," *vide* English dictionary.

*Tinctura Quininæ Ammoniata* should be applied without the application of heat, thus :—Diffuse the sulphate of quinine in eight ounces of the proof spirit, then add the solution of ammonia previously mixed with the remainder of the proof spirit and shake together.

*West Marylebone.* J. C. Hyslop.

Sir,—With Mr. Mitchell's recommendation of finely powdered camphor for lin. camph. I do not agree, having found it produce a turbid liniment, probably owing to the s. v. r. used in powdering. Flowers of camphor I have also found to produce the same result. I make the liniment in a cylindrical tin, fitted with a tap, and a tray having a perforated bottom, which carries the camphor cut small with a root-knife, and can be suspended at any height by means of cords and hooks. The camphor being thus kept at the top of the oil is soon dissolved.

*Apomorphinæ Hydrochlor.*—Dott states solubility as 1 in 50 of water; more soluble in alcohol.

*Aqua Camphoræ.*—This would be made of more uniform strength as well as more conveniently by adding a proportionate quantity of sp. camph. to the aqua, and shaking until the precipitate is re-dissolved.

*Ext. Cascara Liq.* should be deprived of the bitter and griping constituent, as is done by some makers.

*Lin. Ammon.* would be greatly improved by the addition of ʒi sp. v. r., which renders it more fluid.

*Lin. Tereb. Acet.*—As this is very often required to be made extemporaneously, ol. tereb. 3 ozs. would be a much more convenient quantity, producing 8 ozs. (or drms.) instead of 9.

*Mel. Boracis* should certainly be made stiffer, but I should think pulv. glycyrrh. or amyli more suitable than tragacanth.

*Tinct. Camph. Co.* is much more conveniently made thus—

| | |
|---|---|
| Acid benz. | ʒii ℈i. |
| Ol. anisi | ʒii. |
| Sp. camph | ℥iiss. |
| Tr. opii | ℥iv ʒvii (or ℥v). |
| Sp. vini. rect. | Oii ℥vi. |
| Aq. dest. | Oi ℥viii. |

*Tinct. Quina. Ammon.*—Diffuse quinine in half the spirit, add liq. ammon. to the other half, then mix.

One-eighth ounce is sometimes ordered as 54 grains, sometimes 55, sometimes 56. Uniformity would be better.

*Kettering.* J. F. Thursfield.

### The Sale of Flypapers.

Sir,—It will doubtless be of interest to your readers to know that we have received a letter from the Secretary of the Patent Medicine Vendors' Defence Association, stating that they have withdrawn the prosecution with regard to the sale of flypapers. You are aware that the Oldham magistrates held that flypapers do not come within the meaning of the Act, but granted leave for appeal, and the Association now gives us liberty to announce the fact of their having abandoned the prosecution.

*Hulme, Manchester.* William Mather, Limited.

### A Disclaimer.

Sir,—A circular issued by the Patent Medicine Vendors' Defence Association, applying to chemists and druggists for subscriptions, has been brought under my notice. As it bears my name very prominently, I beg to inform you that I was quite unaware of its existence, and am in no way responsible for it. My connection with the Association is confined to doing chemical work for it, but I have nothing to do with its management or policy.

28, *Chapel Street, Liverpool.* Edward Davies.

### Tests for Gallic and Tannic Acids.

Sir,—I enclose particulars of distinguishing tests for gallic and tannic acids respectively, hitherto, I believe, unknown and unpublished. Tannic acid :—To a solution of tannic acid add solution of chloride of barium, a pink precipitate results, gradually darkening. Gallic acid :—To a solution of gallic acid add solution of potash and solution of chloride of barium, a blue precipitate results.

*Newington Causeway, S.E.* Frederick Davis.

## Obituary.

On May 26, Joseph Rees, Chemist and Druggist, of Mumbles. (Aged 27). Mr. Rees was an associate in business of the Society.

On June 14, John Evans, late of Mumbles, Pharmaceutical Chemist. (Aged 29). Mr. Evans was a member of the Society.

## Books, etc., received.

The Year-Book of the Imperial Institute for 1894. Pp. i.-xvii., 1 to 888. London: Office of the Institute, South Kensington. From the Secretary and Director.

Proof Spirit and Fiscal Hydrometry. By Benjamin Derham, M.D. Pp. 82. 3*s*. 6*d*. Manchester: John Heywood. From the Publisher.

Handwörterbuch der Pharmacie. Edited by A. Brestowski. Parts 15 and 16. Volume II. Pp. 145-224 and 225-304. 2 M. 40 Pf. each part. Vienna and Leipsic: Wilhelm Braumüller. From the Publisher.

Anatomischer Atlas der Pharmakognosie und Nahrungsmittel. By Dr. A. Tschirch and Dr. O. Oesterle. Part 4. (Vanilla; Fruct. Papaveris, Sem. Papaveris, and Opium; Kaffee, Fol. Coffeæ; Fol. Menth. Pip., Fol. Menth. Crisp., and Andere Menthaarten; Rhiz. Calami). 1*s*. 6*d*. net. London: Williams and Norgate. From the Publishers.

Universal Poison Labels. By Major G. F. Gamble. Pp. 10. Dublin: Charles Chambers. From the Author.

## Diary of the Week.

Monday, July 2.

*Royal Institution of Great Britain*, at 5 p.m.
General Monthly Meeting.

Tuesday, July 3.

*Pharmaceutical Society of Great Britain.*
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.

Wednesday, July 4.

*Pharmaceutical Society of Great Britain*, at 11 a.m.
Council Meeting.
*British Pharmaceutical Conference*, at 4.30 p.m.
Meeting of the Executive.
*Edinburgh Chemists', Assistants', and Apprentices' Association.*
Botanical Excursion to Braid Burn, to meet at Morningside Station at 6 a.m.

Friday, July 6.

*Quekett Microscopical Club*, at 7 p.m.
Meetings for the Exhibition of Objects.

## Notices to Contributors.

⁂ *Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., before noon on Wednesday, if publication be desired in the next issue of the Journal; though this cannot always be guaranteed.*

*Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.*

*No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.*

*All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names alone commenced with capital letters.*

Communications, Letters, etc., received from Messrs. Clarke, Edward, Hill, Naylor, Roebuck.

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